



Spatial evaluation of cultural tourism potential in Anuradhapura district, Sri Lanka: GIS based weighted overlay analysis

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ABSTRACT

Cultural tourism is an important tool of socioeconomic development as well as the maintenance of historical heritage, especially in culturally heritage-rich few like the Anuradhapura District. The tourism potential of this region is not well explored despite its importance because of many drawbacks such as inappropriate infrastructure development, unplanned urbanization, and agricultural encroachment. This paper is an effort to assess the spatial suitability of Anuradhapura on cultural tourism development, which is done on a Geographical Information Systems (GIS) platform. A Weighted Overlay Analysis (WOA) was developed to incorporate various spatial databases involving elevation, land use/Land cover (LULC), road accessibility, close to cultural heritages sites, and climatic situations. The layers were standardized and the weights of each layer were determined through literature research and expert based relevancy to suitability of tourism. District suitability was analyzed into four classes of both highly suitable, moderately suitable, low suitable and unsuitable. The results indicate that 27.42% of the land area (approximately 196,764 hectares) is highly suitable for cultural tourism, characterized by optimal accessibility, cultural density, and favorable environmental conditions. An additional 59.37% is moderately suitable,

indicating areas with development potential under certain improvements, while 13.2% of the district is either low in suitability or unsuitable due to natural or infrastructural constraints. Validation against field observations and existing tourism hotspots showed a strong spatial correlation between predicted high-suitability zones and current visitor patterns. The study concludes that data-driven spatial planning is essential for sustainable tourism development in heritage regions. Recommendations include improving infrastructure and accessibility in high-potential zones, involving local communities in tourism activities, and applying geospatial tools for continuous monitoring and planning. This research presents an original and replicable GIS-based framework for cultural tourism suitability analysis, offering valuable insights for planners, policymakers, and conservationists in balancing development with heritage preservation.

Keywords: Cultural tourism, Heritage management, GIS, Tourism suitability mapping

INTRODUCTION

Cultural tourism is becoming an increasingly important component of the global tourism business, with chances to combine economic development and cultural heritage protection (UNWTO, 2019). Defined as a sort of tourism that allows tourists to interact with a region's tangible and intangible cultural treasures, it has become a pillar of regional development and cultural preservation efforts. Sri Lanka is very famous for its natural beauty and native products, and tourism is one of the vital sectors for the Sri Lankan economy. Sri Lankan tourism is identified as a third economic sector in generating income for the nation (Nuskiya & Kaldeen, 2019). Cultural tourism, a well-known sub-sector of tourism, aims to connect visitors with a certain destination's cultural heritage, traditions, and lifestyle. Anuradhapura is a UNESCO World Heritage Site in Sri Lanka and has enormous potential for cultural tourism due to its rich archaeological legacy and strong traditions dating back over two millennia. Tourism is one of the world's fastest-growing economic sectors, making substantial contributions to national economies and offering job opportunities in a variety of places. Before the COVID-19 pandemic, tourism accounted for over 10% of worldwide GDP and 7% of international trade, according to the United Nations World Tourism Organization (UNWTO, 2020). It takes many forms, including leisure, adventure, cultural, and eco-tourism, and is driven by reasons such as globalization, increased disposable money, and advances in transportation and technology (Smith et al., 2017). The highest ecological, topographical, and cultural value and potential can be identified with a number of categories, including ecological, topographical, climatological, hydrological, and cultural potentials, which are more helpful in determining a tourist destination's suitability. Therefore, the growth of tourism can also aid in regional development (Fareena, 2023). Economically, it promotes regional growth and infrastructural expansion, while socially, it fosters cultural interchange and local community empowerment (Hall & Page, 2014). However, if not managed properly, it can lead to environmental deterioration, cultural commodification, and socioeconomic disparities (Gossling & Hall, 2006). As a result, modern tourism planning prioritizes sustainable methods that combine economic growth, environmental protection, and cultural authenticity.

Anuradhapura is, one of Sri Lanka's first established urban areas and capitals, is home to landmarks of tremendous historical and spiritual value, such as the sacred Jaya Sri Maha Bodhi tree, Ruwanwelisaya Stupa, and other ancient monasteries (Silva, 2015). They are pilgrimage places related to religion as well as an international tourist attraction. Nevertheless, random urban sprawling, rural cultivation, and territorial limitations, all act as a challenge to the viability of cultural tourism in Anuradhapura in the long-term, making it necessary to put in place a systematic and data-base planning approach. GIS enables scholars to conduct the analysis of the possibilities of tourism destinations keeping in mind environmental, socioeconomic, and infrastructural factors (Batista et al., 2020). Popular GIS-based tool used in tourism planning includes WOA, particularly in undertaking appropriateness analysis. The method involves aggregation of several spatial data and giving different sets of criteria different weights based on their relative worth (Eastman, 1999). The weighted layers are subsequently aggregated to form composite suitability map that identifies places more suitable to a given activity such as cultural tourist development. WOA has successfully been applied in myriad researches to evaluate tourism potential. As an illustration, Abebe et al. (2019) have employed WOA to evaluate the cultural tourism feasibility in Ethiopia having considered such factors as proximate locations to heritage sites, accessibility as well as land use and environmental restriction. Windingly, studies in India and Turkey have indicated that WOA is useful in determining the right tourism areas without having any environmental and social effects (Demirel et al., 2018; Kumar et al., 2020). The literature emphasizes the necessity of using GIS-based approaches, such as WOA, in cultural tourism planning, particularly in heritage-rich areas like Anuradhapura.

The objective of this study is to determine the spatial potential of cultural tourism development in Anuradhapura District by the use of GIS and WOA. It evaluates the level of suitability of land by using important criteria like topography, accessibility, landscape to heritage and infrastructure. The goal is to contribute to strategic planning by geographically locating regions most inclined to sustainable initiatives in what concerns cultural tourism. The research deploys measures that include proximity to cultural sites, accessibility, and limitations of the environment, and land-use trends to outline how parts of the land can be developed to accommodate sustainable tourism. The project will provide a discussion on the construction of equilibrium between cultural preservation and economic advantage to the local community by integrating the local socioeconomic data with the spatial analysis. Legislators, tourism planners and conservationist should take note of the conclusions of this study and act appropriately. They help to preserve the unique cultural heritage of Anuradhapura in the long term, not only that, as reported by the United Nations Educational, Scientific, and Cultural Organization (UNESCO, 2018), they ensure that they are implementing best practices in heritage tourism management. In this paper, background information has been organized to reference other literature and give details of the study area, research methodology, findings, and ways through which efficient planning of cultural tourism development can be envisioned.

METHODOLOGY

Study area

Anuradhapura district is based in North Central Province of Sri Lanka. It is located between latitudes 7°30'N and 8°30'N and longitudes 79°30'E and 80°30'E. The topography of the district is also flat with many historic irrigation tanks making the district the center of agriculture. The Malwathu Oya is one of the major rivers. Anuradhapura's rich history began when King Pandukabhaya made it his capital in the fourth century BCE. Under King Devanampiya Tissa, who supported Buddhism in the area, it thrived as a significant metropolitan hub. Anuradhapura District's population was projected to be 954,000 as of 2021. 91% of people are Sinhalese, with a small minority of Tamils (1%), and Sri Lankan Moors (8%), among others (DCS Report, 2020). Anuradhapura is located in the Dry Zone of the island, and it falls into the seasonally dry tropics (Panabokke1996). The Northeast monsoon from December to February brings rainfall to the area. Study Area obtains annual rainfall of 1700 mm and Temperature 28°C to 32°C (Sri Lanka Meteorological Department, 2022).

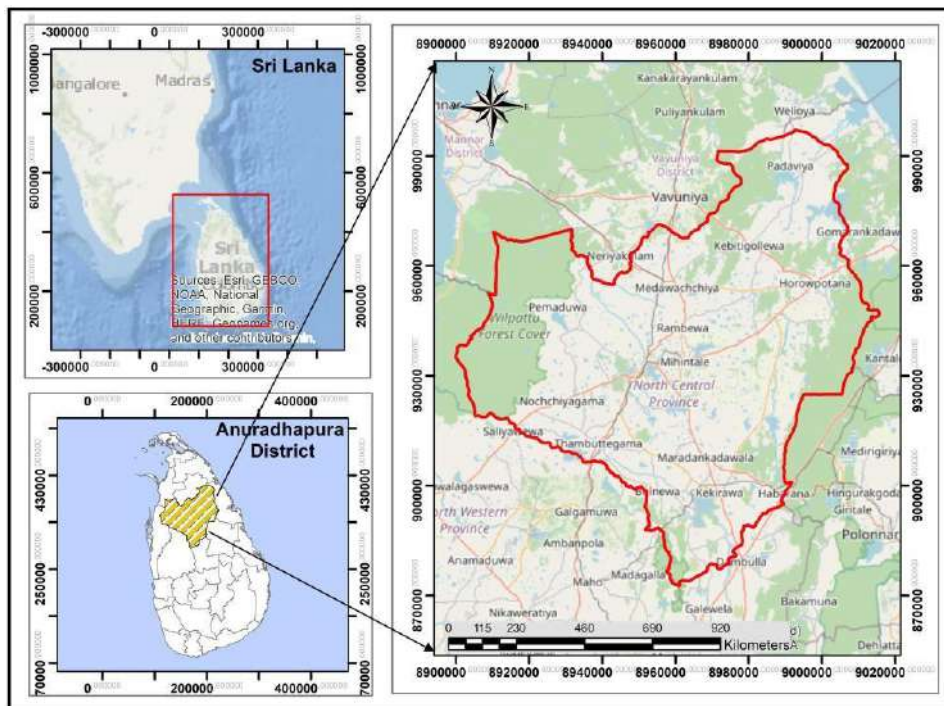


Figure 1. Location of study area (Source: Retrieved using ArcGIS 10.8)

Research design

This study assesses the potential and suitability of cultural tourism in the Anuradhapura district through the application of GIS. The research adopts an applied methodology, utilizing spatial analytics techniques such as WOA and mapping methods. The conceptual framework, illustrated in Figure 2, outlines the overall research design. The analysis incorporates five main criteria and 16 sub-criteria to evaluate the district's tourism capacity.

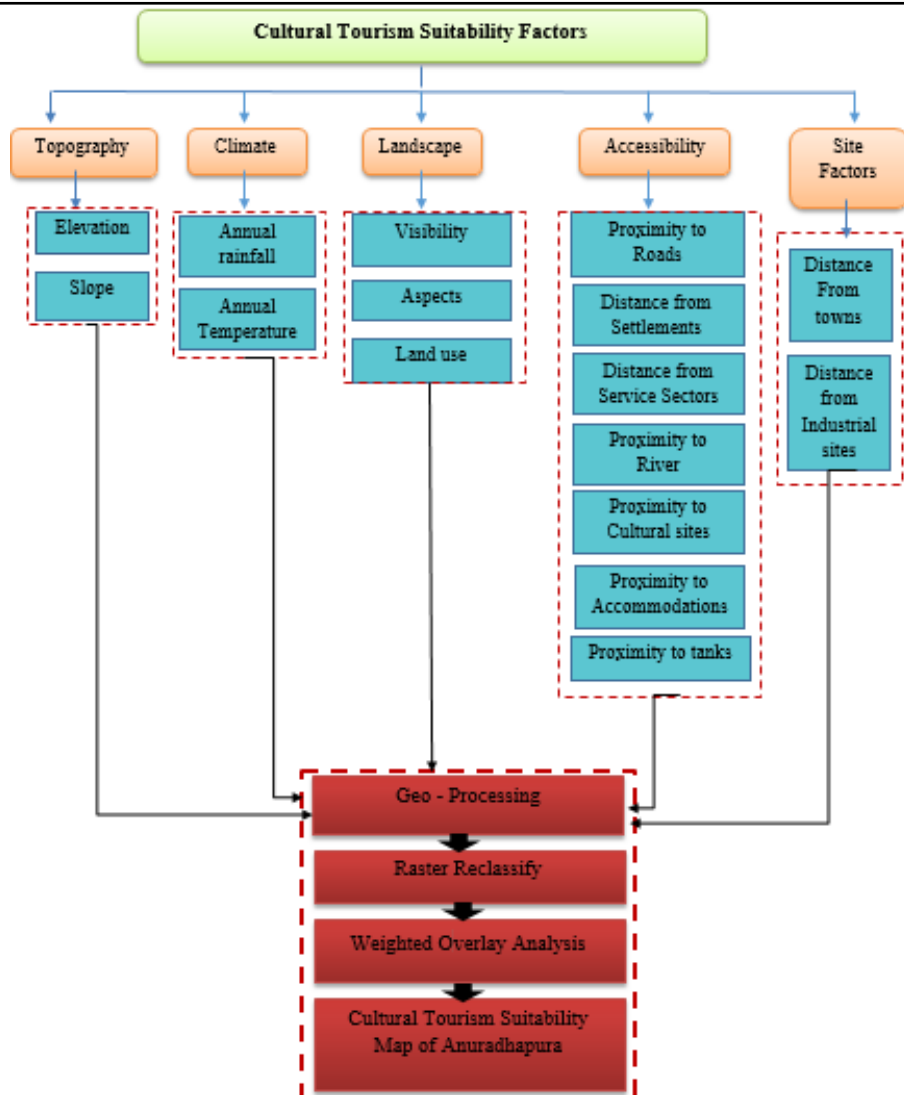


Figure 2. Research flow chart

Data collection and research methods

The cultural tourism suitability analysis for the Anuradhapura district utilized both primary and secondary data to identify key factors influencing cultural tourism potential. Field surveys, including GPS-based data collection and interviews with knowledgeable individuals, identified significant cultural, historical, and accessibility elements. Secondary data from sources such as USGS DEM, the Sri Lanka Meteorological Department, and the Survey Department of Sri Lanka were integrated into GIS-based methodologies. Factors like elevation, slope, visibility, and aspect were analyzed using raster surface analysis, while climate data (Temperature and Rainfall) was interpolated using the IDW method. Land use data was reclassified through the Google Earth Engine to identify areas suitable for tourism development. Accessibility was assessed using Euclidean distance methods to

analyze proximity to roads, settlements, service sectors, rivers, cultural sites, and accommodations. Buffer analysis was used to determine the distance from towns and industrial sites, ensuring the cultural relevance and minimal industrial impact. This comprehensive GIS-based approach facilitated the identification of areas most suitable for cultural tourism, balancing accessibility, heritage preservation, and environmental sustainability.

Table 1. Listed data sources

Factors	Criteria	Geo Processing	Source
Topography (F1)	Elevation (C1)	Raster Surface Analysis	USGS DEM Data https://earthexplore.usgs.gov
	Slope (C2)	Raster Surface Analysis	USGS DEM Data https://earthexplore.usgs.gov
Climate (F2)	Temperature (C3)	IDW	Sri Lanka Meteorological Department (Data From the Year of 2023)
	Rainfall (C4)	IDW	Sri Lanka Meteorological Department (Data From the Year of 2023)
Landscape (F3)	Visibility (C5)	Raster Surface Analysis	USGS DEM Data https://earthexplore.usgs.gov
	Aspect (C6)	Raster Surface Analysis	USGS DEM Data https://earthexplore.usgs.gov
	Land use (C7)	Reclassify	Google Earth Engine https://earthengine.google.com
Accessibility (F4)	Proximity to roads (C8)	Euclidean distance	Survey Department of Sri Lanka https://www.survey.gov.lk
	Proximity to settlements (C9)	Euclidean distance	BBBike extracts Open Street Map https://extract.bbbike.org
	Distance from service sectors (C10)	Buffer	BBBike extracts Open Street Map https://extract.bbbike.org
	Proximity to rivers (C11)	Euclidean distance	Survey Department of Sri Lanka https://www.survey.gov.lk
	Proximity to cultural sites (C12)	Euclidean distance	BBBike extracts Open Street Map https://extract.bbbike.org
	Proximity to accommodation (C13)	Euclidean distance	BBBike extracts Open Street Map https://extract.bbbike.org

Site factors (F5)	Proximity to Tanks (C14)	Euclidean distance	Survey Department of Sri Lanka https://www.survey.gov.lk
	Distance from Towns (C15)	Buffer	Survey Department of Sri Lanka https://www.survey.gov.lk
	Distance from Industrial sites (C16)	Buffer	Field Survey Coordinates Data gathered from: CTDroid Sri Lanka mobile GPS version

The determination of criteria and sub-criteria for cultural tourism suitability analysis involves evaluating and allocating suitable regions for cultural tourism. The most relevant criteria and sub-criteria influencing the selection of cultural tourism sites are identified, as shown in the table. They are Topography, Landscape, Accessibility, Climate, and Site Factors. According to the WOA each criterion is weighted, and the suitability ratings can be given one of the four levels (high suitable to not suitable) depending on designated boundaries. The systematic procedure helps to have the expansive analysis of land suitability towards the development of cultural tourist draws.

Table 2. Weighted values for the selected criteria

Criteria & Weight	Unit	Rating	Weighted Values	Class Description
Elevation (C1) 8%	Elevation Range (m)	4	0-100	High Suitable
		3	100-300	Moderate Suitable
		2	300-600	Low Suitable
		1	>600	Not Suitable
Slope (C2) 7%	Slope (%)	4	0-10	High Suitable
		3	11-20	Moderate Suitable
		2	21-30	Low Suitable
		1	>30	Not Suitable
Temperature (C3) 10%	Annual Temperature (°C)	4	21-23	High Suitable
		3	24-26	Moderate Suitable
		2	26-28	Low Suitable
		1	>28	Not Suitable
Rainfall (C4) 10%	Annual Rainfall (mm)	1	1000-1200	High Suitable
		2	1300-1500	Moderate Suitable
		3	1500-1700	Low Suitable
		4	>1700	Not Suitable
Visibility (C5) 5%	Visibility Range (km)	3	>10	High Suitable
		2	1-5	Low Suitable
		1	<1	Not Suitable

Aspect (C6) 6%	Aspect	4	South	High Suitable
		3	East	Moderate Suitable
		2	West	Low Suitable
		1	North	Not Suitable
Land Use (C7) 9%	Land Use	4	Water Bodies	High Suitable
		3	Urban Area	Moderate Suitable
		2	Forest	Low Suitable
		1	Cultivation Area	Not Suitable
Proximity to roads (C8) 5%	Distance Range (km)	4	1-2	High Suitable
		3	3-6	Moderate Suitable
		2	7-10	Low Suitable
		1	>10	Not Suitable
Proximity to Settlements (C9) 5%	Distance Range (km)	4	1-2	High Suitable
		3	2-4	Moderate Suitable
		2	4-6	Low Suitable
		1	6-8	Not Suitable
Distance From Service Sectors (C10) 5%	Distance Range (km)	4	<1	High Suitable
		3	1-3	Moderate Suitable
		2	4-6	Low Suitable
		1	7-10	Not Suitable
Proximity to rivers (C11) 5%	Distance Range (km)	4	1-2	High Suitable
		3	2-3	Moderate Suitable
		2	3-5	Low Suitable
		1	>5	Not Suitable
Proximity to Cultural sites (C12) 5%	Distance Range (km)	4	1-2	High Suitable
		3	2-3	Moderate Suitable
		2	3-5	Low Suitable
		1	>5	Not Suitable
Proximity to Accommodation (C13) 5%	Distance Range (km)	4	<1	High Suitable
		3	1-3	Moderate Suitable
		2	4-6	Low Suitable
		1	>6	Not Suitable
Proximity to Tanks(C14)	Distance Range (km)	4	<1	High Suitable
		3	1-3	Moderate

5%				Suitable
		2	4-6	Low Suitable
		1	>6	Not Suitable
Distance from Towns (C15) 4%	Distance Range (km)	4	<1	High Suitable
		3	1-2	Moderate Suitable
		2	2-3	Low Suitable
		1	>4	Not Suitable
		4	>10	High Suitable
		3	7-10	Moderate Suitable
Distance From Industrial Sites (C16) 6%	Distance Range (km)	2	4-6	Low Suitable
		1	<3	Not Suitable

Table 3. Values for major criteria

Factors	Weight Values
F1	15%
F2	20%
F3	20%
F4	35%
F5	10%

Data analysis

The WOA is also a common approach used in multi-criteria decision-making procedure, especially in ranking suitable lands to diverse undertakings. It entails the application of weights to various criteria in regard to relative significance with regards to the research aim. These weightings are then synthesized in a procedural character to give a compound fit map. WOA allows for the integration of multiple factors, such as topography, accessibility, environmental features, and cultural significance, ensuring a comprehensive evaluation of the area under study. The WOA assigns weights to each criterion and suitability ratings are categorized into 4 classes (Highly suitable to Not suitable) based on specific thresholds. The cultural tourism suitability of each criterion was generated (Figure 3) based on score values utilized for different ranges.

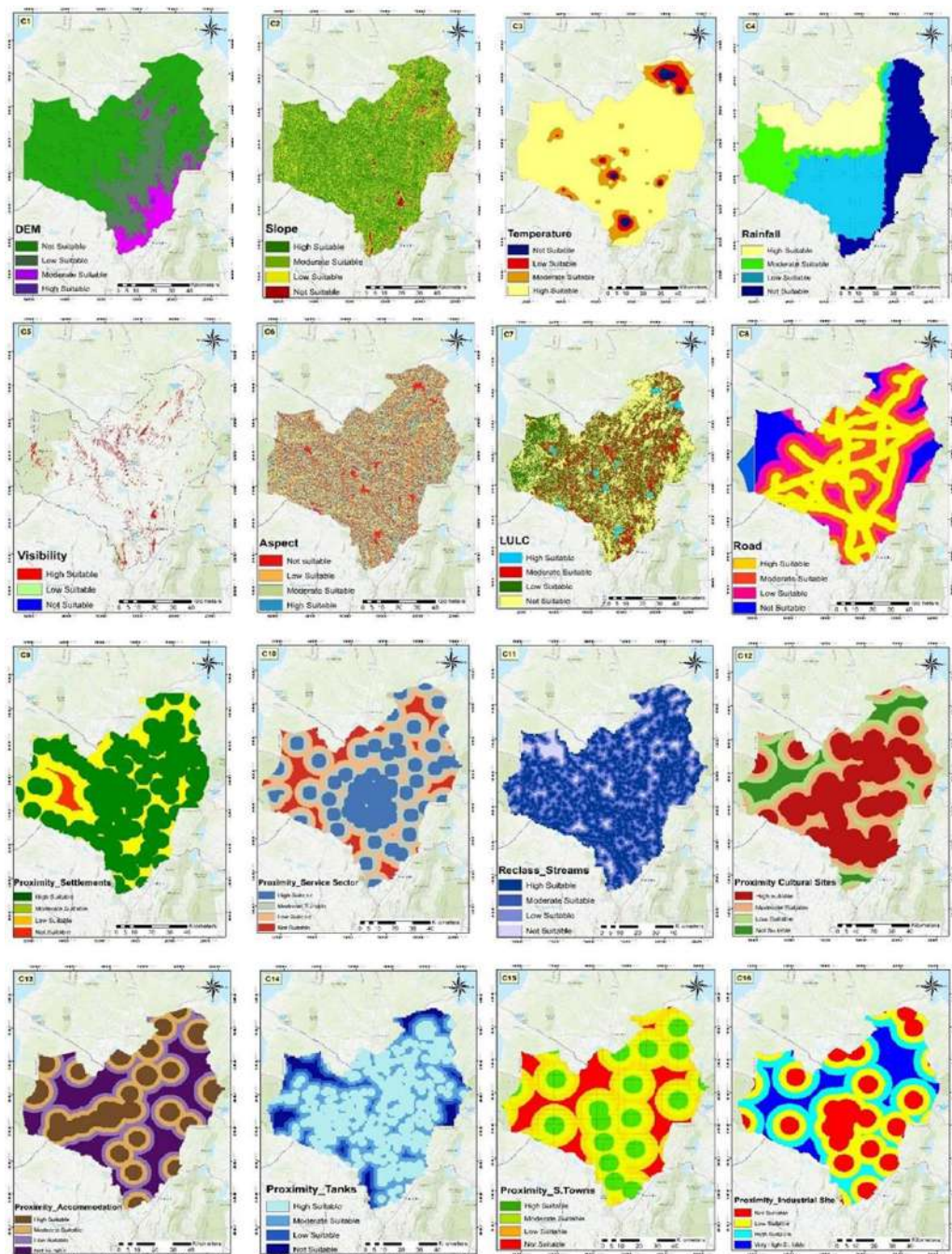


Figure 3. Cultural tourism suitability for selected criteria

RESULTS AND DISCUSSION

Topography

Topography is of great significance in predicting the appropriateness of the regions to develop cultural tourism, especially topography in terms of elevation of the terrain and slope. Topographical analysis was carried out in the Anuradhapura District, where most of the landscape is flat, and the ASTER DEM of USGS was used. The lower ground with smooth slopes (0-10, 0-100 m) was observed to be very conducive when it comes to tourism because accessibility is achieved easily, and infrastructure can easily be established and constructed safely. On the contrary, the area with a height of more than 600 m or steepness of more than 30 percent was grouped under inappropriate because these areas are prone to soil erosion, inaccessible, and expensive to construct. Topography was given a 15 percent weight in the overall suitability analysis, and this was to show its average but important weight. A large amount of the highly suitable areas of land of 27.42 percent, which were mapped out to be critical tourist areas, were situated in the generally flat terrain of the district. Such level ground, which boosts the physical viability of the construction of the facilities, also conserves both the aesthetic and historic value of the cultural sites. In general, topography has helped in the tourism industry in ensuring accessibility as well as preservation, and therefore makes it a study that is used in base when conducting suitability tests of lands that would be used in cultural tourism.

Climate

Climate is a major determinant of attractiveness and comfort to tourism, especially outdoor cultural tourism in such an area as Anuradhapura. The research evaluated temperature and rainfall data obtained by the Sri Lanka Meteorological Department on the year 2023 through the interpolation technique of IDW of GIS analysis. The cultural tourism could be offered at the optimum temperature range between 21-23°C, as this provides an optimum environment to visit the sites and other activities that are outside. Zones above 30° were also graded as not appropriate, because the warmer the environment gets, the more it can discourage tourists, besides causing a high rate of degradation of heritage sites. In like manner, the range of rainfall of 1200-1300 mm was also declared as optimal due to its beneficial aspect of green environs without posing problems of floods. Regions receiving more than 1700 mm of rainfall were also perceived to be less accommodating since the excess rain would cause erosion and inconvenience to tourists. The WOA weight of climate was 20%, which is high and reflects the impact of climate on land suitability. The climate of the Dry Zone in Anuradhapura overall favors year-round tourism; there is conducive rainfall in the Northeast monsoon, and the temperatures are comfortable for the convenience of tourists visiting or staying there. The issue of climate is, therefore, a contributing factor to the aspects of environmental sustainability as well as directly proportional to the experiences as a tourist and the rate of tourists in the various seasons.

Landscape

Cultural tourism greatly depends on the landscape because it helps in determining the beauty and feel of a place. In the Anuradhapura study, this criterion included visibility, aspect (orientation), and land use types, which were analyzed by use of raster surface data and reclassification tools like the Google Earth Engine. Sites that

had scenic visuals of over 10 km were found to be very suitable as they provide wide views of cultural and natural objects, which make them visually interesting to tourists. Aspects that were favored as suitable with regard to exposure to natural light were those facing South, as it provided better visibility of the site and a comfortable environment. In land use, water bodies and areas designated as cultural/recreational areas were considered highly favorable in terms of tourism development, whereas areas under cultivation or forest cover were less favorable because it was either under cultivation or with dense vegetation that prevents access and site viewing. Landscape received 20 percent of the total weight in WOA, and so it is one of the criteria most able to influence. These landscape considerations are not only important to the visual appearance but also to the site conservation and site explanatory purposes. Hence, a concise combination of natural and cultural landscapes can enhance the attractiveness and sustainability of the cultural tourism destination.

Accessibility

Accessibility is the strongest indicator consideration of assessing tourism suitability in Anuradhapura, with the maximum weight of 35 per cent in WOA. It also comprises accessibility to roads, settlements, service facilities, rivers, tanks, cultural attractions, and accommodation systems. A Euclidean distance and buffer evaluation using GIS showed that places that were at a distance of 1 to 2 km from major roads and other cultural attractions were classified as highly suitable areas. The zones make it simpler to access the destinations and get basic services like accommodation and medical attention by the tourists. On the other hand, areas exceeding 5 km far away from major streets, cultural sites, or places were considered inappropriate because of the fewer connections. Accessibility also takes into consideration the closeness to rivers and tanks, which have served the settlement and culture in Anuradhapura in the past and now act as scenic and cultural tourist attraction sites. Proximity to other settlements was found between 1 and 3 km, sufficiently good small distances to enjoy facilities, but avoiding the times when serenity is interfered with. It is critical to understand that accessibility is not only logistically convenient but also critical to marketing multi-site tours, which are much more gratifying to the tourist and profitably promote local economies. In general, accessibility has a direct influence on the feasibility of tourism development in terms of practicality and commercial viability, hence being the central point of spatial planning in heritage tourism.

Site factors

Site-specific factors comprise proximity to towns and distance to industrial areas, also having a combined weight of 10 % in the WOA analysis. These factors make sure that the tourism development is strategically positioned as well as environmentally friendly. The regions located at a distance of less than 3 km from the town were graded as highly suitable because they have some infrastructure in the form of accommodation, restaurants, and hospitals. It also has town proximity, which helps its operations and enriches the visitor experience without the need to interrupt the town with large new development. Conversely, sites close to manufacturing areas were declared inappropriate, and those not more than 3 km away due to the possibility of noise, air, and contamination problems that will impinge on the peaceful and reflective nature of the cultural tourism. Information through which this research was conducted was based on the Survey Department of Sri Lanka and a field survey through GPS

instruments. The factors of a site make certain that the development of tourism does not impinge on incompatible uses of land or does not overlap with them. They contribute to the maintenance of the authenticity and integrity of heritage environments. Site factors can help the development to be more balanced in a way that respects the potential of tourism and the welfare of the community by influencing development away from disruptive areas to more culturally appropriate zones.

WOA process assigns weights to each factor based on its importance and combines them to identify areas most suitable for cultural tourism development. The analysis reveals zones classified as highly suitable, moderately suitable, and not suitable, providing a clear roadmap for strategic planning. The evaluation of these factors demonstrates a holistic approach to cultural tourism planning. By considering topography, climate, landscape, accessibility, and site-specific factors, the thesis provides actionable insights for sustainable and effective tourism development in the Anuradhapura district. These findings are essential for policymakers, planners, and stakeholders aiming to balance economic growth with cultural and environmental preservation.

$$W_i^s = \sum_{j=1}^{j=m} w_{ij}^s w_j^a, \quad i = 1, 2, 3 \dots n \quad (1)$$

W_i^s : Total Weight of the Study Area

w_{ij}^s : Weight layer of all criteria with factor

w_j^a : Weigh of criteria

m : Number of Criteria

n : Number of Sites

j : Specific Criterion within a particular factor

i : Each individual site that is being evaluated for its suitability

This technique combines multiple criteria, assigning weights based on their relative importance. The weights represent the extent to which each criterion can promote the overall compatibility with cultural tourism. This method of evaluation is essential since cultural tourism is associated with a multidimensional nature of different factors, including topographic value, accessibility ecological situation, and infrastructure, which should be evaluated sequentially. The approach is outlined by Saaty (1980) and Nuskiya (2022). The weighted values of all criteria are summed to create a single suitability score for each site.

The Weighted Overlay Analysis methodology and GIS tools ensure a systematic evaluation of an area's potential for cultural tourism. The suitability map provides a clear visual representation of the results, facilitating decision-making for stakeholders. This approach integrates modern technology with established theoretical frameworks, making it a robust tool for sustainable tourism planning.

Table 4. Area cover on the classified land suitability map for Cultural tourism

Suitability Score	Suitable Land (h)	Weighted Percentage
Most Suitable	196,764	27.42%
Moderate Suitable	426,143	59.37%
Low Suitable	58,442	8.14%
Not Suitable	36,369	5.07%
Total	717,900	100%

The total land area analyzed is 717,900 hectares. The analysis divides the study area into four categories based on its suitability for cultural tourism. Most Suitable (27.42%) areas that possess the highest potential for cultural tourism, fulfilling most of the essential criteria, such as proximity to cultural attractions, accessibility, and infrastructure. These areas cover 196,764 hectares. Moderately Suitable (59.37%) regions that meet many of the suitability criteria but may lack some critical factors. These areas are significant for cultural tourism development, covering 426,143 hectares. Low Suitable (8.14%) regions with limited potential for cultural tourism, either due to geographical constraints or lack of cultural significance, these areas cover 58,442 hectares.

Not Suitable (5.07%) areas are deemed unsuitable for cultural tourism, potentially due to natural barriers, lack of infrastructure, or absence of cultural or historical value. This analysis demonstrates the strategic use of GIS for cultural tourism planning, offering insights into how land can be utilized effectively to promote tourism while preserving its cultural and natural assets.

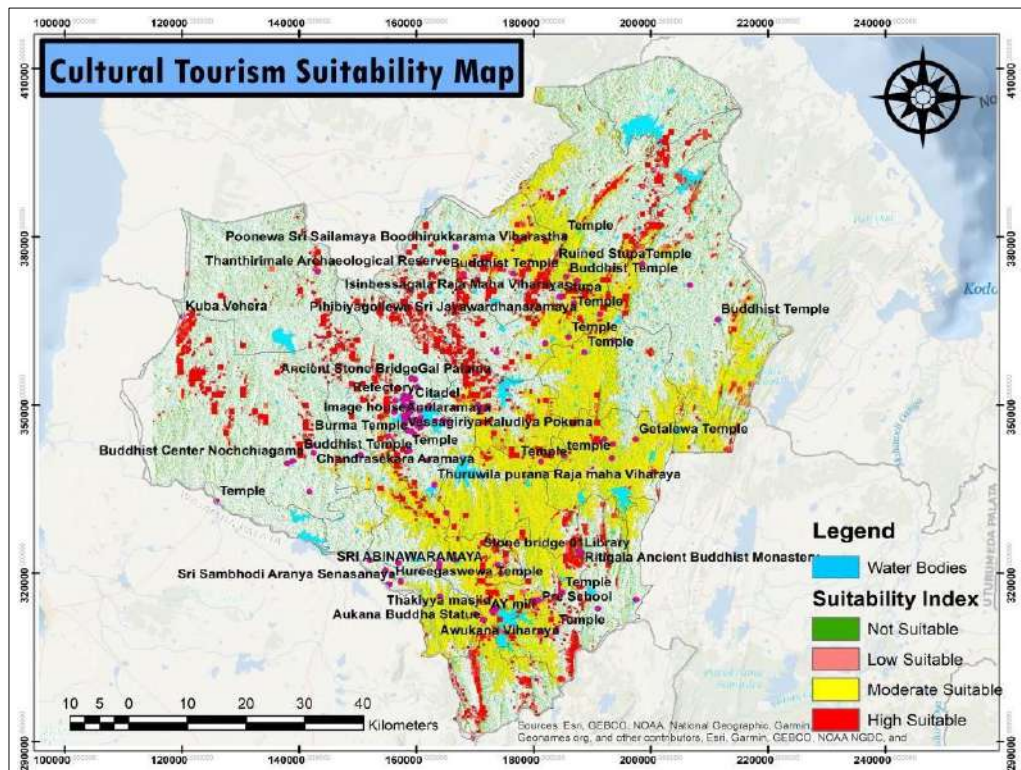


Figure 4. The suitability site for cultural tourism in the Anuradhapura district
(Source: Retrieved using ArcGIS 10.8)

The map is a strategic tool for identifying and prioritizing areas for cultural tourism development. It supports decision-making for sustainable tourism planning, ensuring resources are focused on high-potential regions. The map categorizes the region into different zones based on their suitability for cultural tourism. Highly suitable areas, highlighted in red, these areas have the most potential for cultural tourism due to the presence of significant cultural or historical landmarks, good accessibility, and infrastructure. Moderate suitable areas, shown in yellow, these regions have moderate potential but may require additional development or preservation efforts. Low suitable areas are indicated in blue or lighter shades; these areas have limited potential and may lack cultural significance or infrastructure.

Identified cultural tourism sites in Anuradhapura

The map shows the cultural tourism attractions in the Anuradhapura District. It mentions that, as part of a specific plan, 50 prominent sites were identified for conservation. These include ancient religious sites, historical buildings, natural landmarks, and other significant cultural and archaeological sites. The listed attractions are categorized by their significance, such as temples, shrines, monuments, and other cultural landmarks. Special attention is given to preserving these sites for cultural tourism development. The accompanying map illustrates the locations of these

attractions using GIS tools.

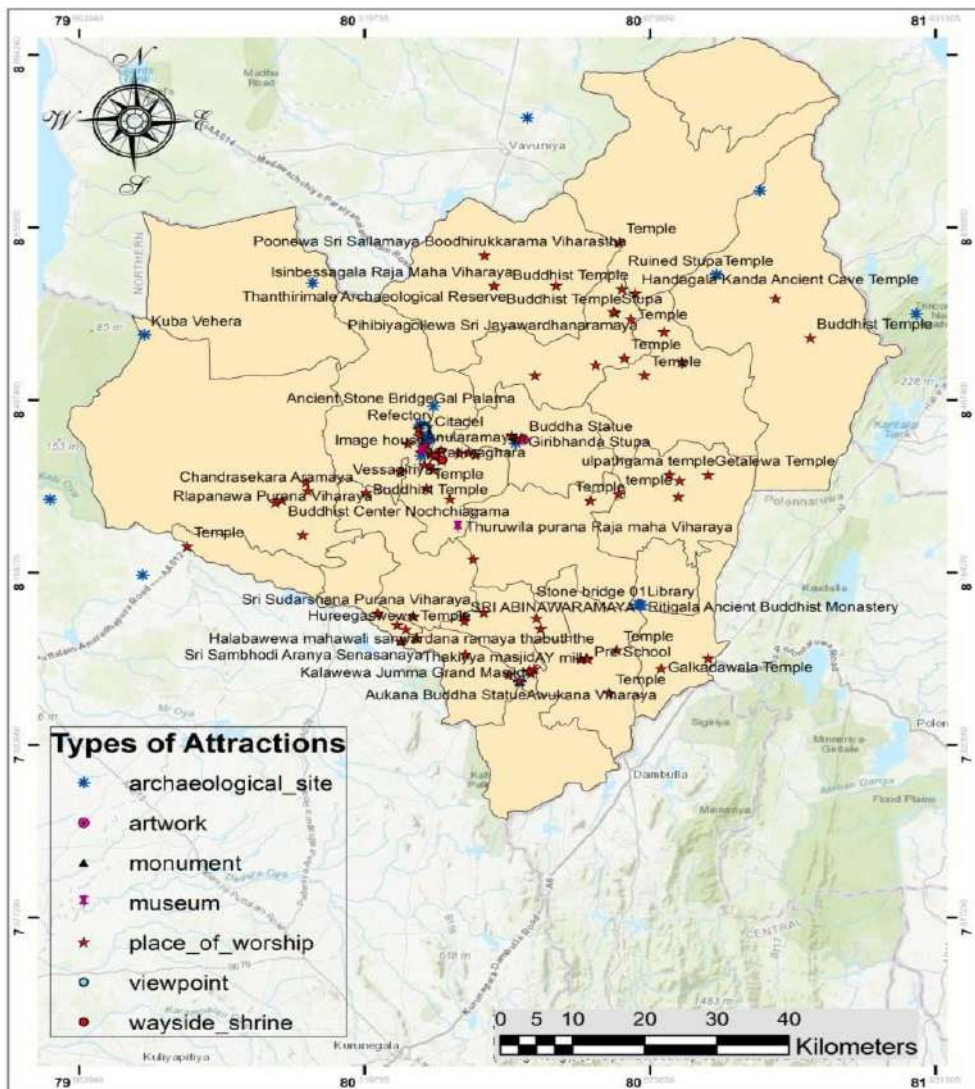


Figure 5. Identified cultural tourism sites in Anuradhapura district (2025)
(Source: Retrieved using ArcGIS 10.8)

CONCLUSION AND RECOMMENDATIONS

Background of the study has focused on finding and examining the possibilities to develop cultural tourism in Anuradhapura District through GIS based approach by site suitability analysis. The report showed that 27.42 percent of the land area as highly suitable or highly desirable to operate cultural tourism, whereas 59.37 percent is moderately suitable. The findings point out that much of the district presents good

prospects of cultural tourism especially in regions where the cultural assets match with the natural landscape including topography, ease of accessibility, and infrastructure development. The spatial analysis demonstrates that decent zones are centralized in significant places of history, certifications of the richness of the area in terms of heritage value. The analysis furnishes a solid geographic underpinning to the planning and policy-making, implying that by making interventions strategically, Anuradhapura can emerge as a major cultural tourist destination in Sri Lanka. Thus, the study confirms the viability of cultural tourism planning using spatial suitability and indispensability in achieving a sustainable development of a region. The findings emphasize the need for a balanced approach that integrates tourism development with cultural and environmental preservation. First, an implement with GIS-based strategic planning approach has to be laid forth, focusing on the highly and moderately suitable zones brought about by spatial analysis. Hence, in these zones, tourism infrastructure investments, such as access roads and/or visitor centers, and sanitation facilities, should be targeted for building so as to cater to accessibility and comfortable visitation. Second, community engagement has to be prioritized in order for the local population to have an active role in tourism planning and to reap the benefits from it economically. Engaging local communities in planning and decision-making processes is critical to ensuring that tourism projects are inclusive and equitable. There is a need to enhance the existing infrastructure, such as transport networks, and accommodation facilities, also actively promote smart use of digital technologies in marketing. Sustainable strategies are suggested by the study as precautionary interventions against over-tourism and in alleviating environmental degradation (Nuskiya, 2022). A continuous monitoring and evaluation mechanism should be established using GIS updates and feedback tools to assess the impacts of tourism activities, ensuring sustainable and adaptive planning over time.

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