

Landscape Character Assessment (LCA) as a tool to explore the development potentials in Kandy

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Abstract Landscape is the result of the actions and interactions between humans and nature, which often conveys a unique character to the land. In this study the applicability of Landscape Character Assessment (LCA) methodology was tested at a local scale in a Divisional Secretariat area. Five natural characteristics, three cultural characteristics and two main visual characteristics were found which are unique to the Kandyan landscape. It was clear that this landscape is full of development potentials especially the landscape characteristics are more favorable to develop tourism due to the uniqueness of the landscape.

Index Terms— Kandyan landscape, Landscape Character Assessment, Landscape character, Likert Scale, Potentials, Tool, Uniqueness,

INTRODUCTION

Landscape “[9],[16],[18]... an area, as perceived by people, whole character is the result of the action and interaction as; of natural and/ or human factors.”(Figure 01) Any landscape is [19] a combination of elements which are particularly important to the current character of the landscape and help to give an area its particularly distinctive sense of place. Thus, LCA is the [1],[15],[16],[18]“process of identifying and describing variation in the character of the landscape. It seeks to identify and explain the unique combination of elements and features (characteristics) that make the landscapes distinctive. [7],[11],[14]LCA is a methodology widely used across the globe for numerous planning purposes. [19]In Sri Lanka LCA approach is rarely used for development studies. This study tries to examine whether LCA can be applied as a tool to identify growth potentials in Kandyan landscape. Kandy is a beautiful city in the Central Highlands of Sri Lanka, its set on a plateau surrounded by mountains, which are home to tea plantations and biodiverse rainforest. River Mahaweli passing through this area. The city's heart is scenic Kandy Lake (Bogambara Lake), which is popular for strolling. Kandy is famed for sacred Buddhist sites, including the Temple of the Tooth (Sri Dalada Maligawa) shrine, celebrated with the grand Esala Perahera annual procession. s Kandy being the last kingdom of the country, is the home for the holy Buddhist culture.[17], [18].Due to this uniqueness of the city Kandy was inscribed by UNESCO as Sri Lanka's fifth and the world's 450th World Heritage site. The city and surrounded area has many development potentials and LCA is a successful method for identify the best characters for developing purpous. The objective of this study is to examine the development potentials in Kandyan landscape

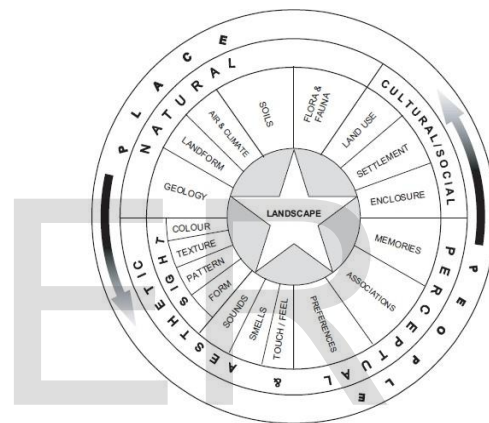


Figure 1: Perceiving landscape

The landscape is produced due the actions and interactions of people and places

METHODOLOGY

The three steps of the LCA is used as the methodology which included the collection of both primary and secondary data and qualitative and quantitative methodologies were used for the study. The methodology has three main steps which are derived from the methodology in the LCA process.

Step 01: Defining the scope of the study.

The emphasis will be given to the kandyan landscape. The geographical extent covered will be the Kandy four gravets area. It is covered with 76.6 square kilometers in extent. This division is bounded on the North by Haripaththuwa divisional secretary's division, on the south by Pathahewaheta divisional secretary's division, on the west by Udunuwara and Yatinuwara divisional secretary divisions on the east by Kundasale divisional secretary's division. 64 Grama Niladari Divisions (GNDs) can be found in this study area.

[20]The oldest known name used on Kandy had been “*Siriwardana nuwara*”. In some places and texts it had been named as ‘*Sriwardhana nuwara*’ and [4] *Siriwardhanapura*. During the British era this area was called as ‘*Kanda*’ (Mountain) which later became Kandy which is used at the present also.

Secondly, the availability of two natural forests Udawaththa kele forest and Dunumadalawa forest and one natural park; King’s palace park within the study area is a very specific finding. The uniqueness of these forests are, they had been there since the beginning of the Kandyan kingdom and had been used by the royalty for their leisure time activities. Especially Dunumadalwa forest area is the origin of most of the tributaries joining Mahaweli river from all sides. Therefore the drainage density is higher in the Southern part of the study area. Thirdly, one mountain range and two mountains can be identified. Hanthana mountain range, acts as the dominant mountainous feature. It has been spread in the southern and south western parts of the area. The slope extends from North to south which extends from 608-1200 meters altitude. (The GNDs marked in brown) Badirawanakanda mountain is one of the highest view points in the area. It is situated at an elevation of 1945 ft from sea level. On to the eastern side of the study area is Yakandurawa mountain where the treasures of the kings have been hidden. Fourthly, one waterfall can be found in the down slopes of Hanthana Mountain. It is one of the eye catching landscapes in the study area. The water levels increases during the rainy times making the waterfall looks magnificent. Finally, due to the topography of the area being located in a plateau and the rainfall pattern, the climate changes from wet to dry from the beginning of Victoria-Randenigala-Rantembe (VRR) conservation area.

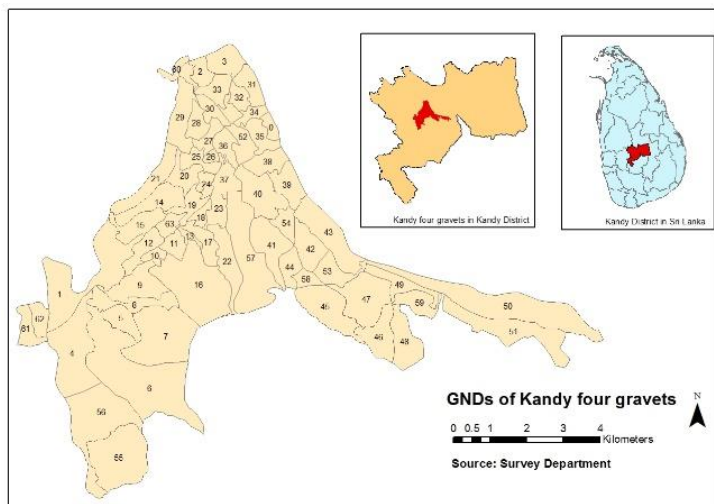


Figure 2: Study Area (Kandy Four Gravets area)
The study area is composed of 64 GNDs

Step 02: Desk study

A desk study had been done to identify the landscape characters under three main spatial layers. Only a selected number of characters have been used for the study. Under the natural landscape spatial layer, characters related to the landform, climate and hydrology have been examined. Land use types and settlements (population distribution) have been examined under the cultural landscape while literature, folklore and visual aspect related to the kandyan landscape have been explored under the visual and sensory spatial layers

In the desk study mainly the secondary data have been collected through, resource profiles, 1:50000 maps, google maps, books, research publications, data from [8] Department of Census and Statistics and ancient records. These data are being analyzed by Arc Map software (overlay analysis, 3D analysis) both by using qualitative and quantitative methods.

Step 03: Field survey

A field survey was done to cross check the data gathered from secondary data sources. Primary data sources such as; photographs, videos, observations, discussions with the residents, annotated sketches, and field survey sheets were used. The visual interpretation about the landscape will be quantified using the likert scale from 1 to 5. Also, a questionnaire was filled to get the perception of the people.

Results

Natural landscape of the study area

Five notable natural characters (Figure 3) were found during the desk study. They are; the well-defined drainage network where the tributaries origin from Hanthana mountains and Hewaheta highlands, flow towards the south and west, meet Mahaweli river at Peradeniya and Gatambe and from the North in Katugastota and Haragama where the tributaries join Mahaweli river. It acts as a natural boundary from three sides separating the study area from other areas.

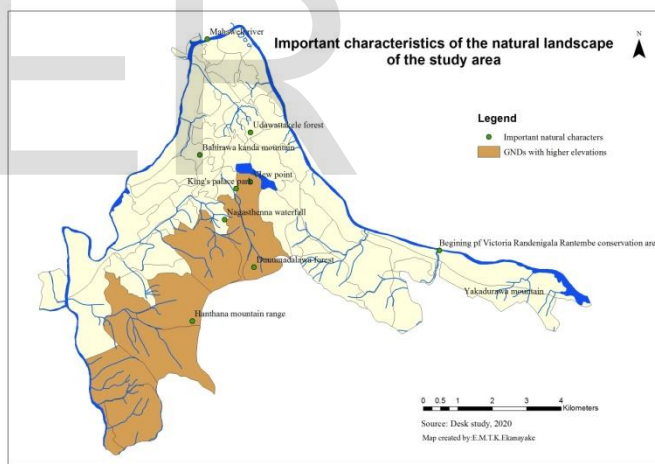


Figure 3: Important characteristics of the natural landscape of the study area

5 notable natural characters were identified

Cultural landscape of the study area

Under the cultural landscape of the study area, 3 major characteristics can be found with a total of 6 characters. (Figure 4) Three main characters related to the land use were identified. Firstly, the situation of a built up area in the center of the study area was very significant. It acts as a hub where the transportation networks cross over to the three sides. The roads from Colombo, Trincomalee, Kurunegala, Jaffna and Chenkaladi meet at the center of the area. Also it acts as the service hub of the whole Kandy district. Secondly, the availability of tea cultivated areas especially in the hilly areas was identified. These are the tea estates started during the British era and the biggest patch is available in Hantana area. Thirdly, the distribution of paddy lands along the tributaries was noted during the desk

study. In Kandy, due to the topography of the land, the paddy is being cultivated in terraced lands.

When considering about the population distribution of the study area [13] Thennekumbura GND is having the highest population density of the area.

Through the desk study and the field survey, 40 culturally important places were identified. The importance is that all these places have a historical background with regard to the history of the Kandyan kingdom. And it was interesting that out of all 40 places, 16 (40%) places are located in the congested built up area. Two minor clusters can be found towards the North West (23,24,25) and Southern part (6,7,8,9) of the built up area.

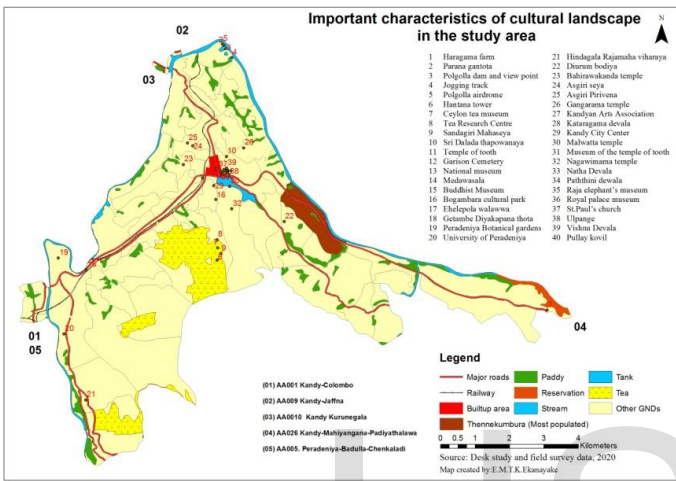


Figure 4: Important characteristics of the cultural landscape of the study area.

6 main cultural characters were found in the area

Visual and sensory landscape of the study area

When considering about the visual beauty of the area, (Figure 6) the study area has a moderate scenic beauty (Average of 3.09 in likert scale) where (1= Least scenic value, 5= Most scenic value) especially the people’s perception on the beauty of these areas was taken through the likert scale (from 1-5) after a questionnaire survey from 50 local residents. Pictures and places situated in each GND were shown to the participants to get their ratings.

According to their lived experiences, the most common response given was that, the scenic beauty of Kandy is gradually depleting due to the mass scale constructions, encroachment towards mountains, vertical constructions obstructing the natural beauty of the area specially in the mountainous areas. Therefore, the visual aspect of the area is very low in the Northern part of the study area. But the southern part is having higher gradients due to the breath taking views of Hanthana mountain range.

Kandy is an area where the typical Sinhalese culture has been preserved. The literature and folklore linked to the study area proves that, the residents and the local authorities still try to preserve the endemic culture of Kandy. One of the best examples is that the presence of the temple of the tooth of the Lord Buddha right in the middle of the city. The stories linked to the temple and near by places have still being preserved.

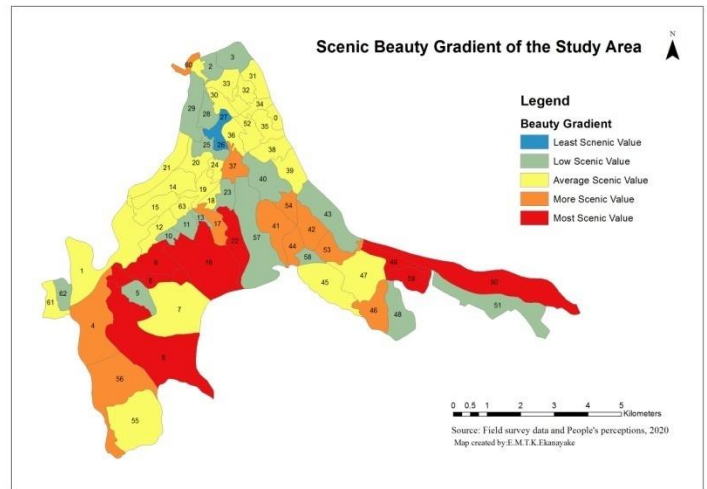


Figure 5: Scenic beauty gradient of the visual and sensory landscape of the study area

Research findings

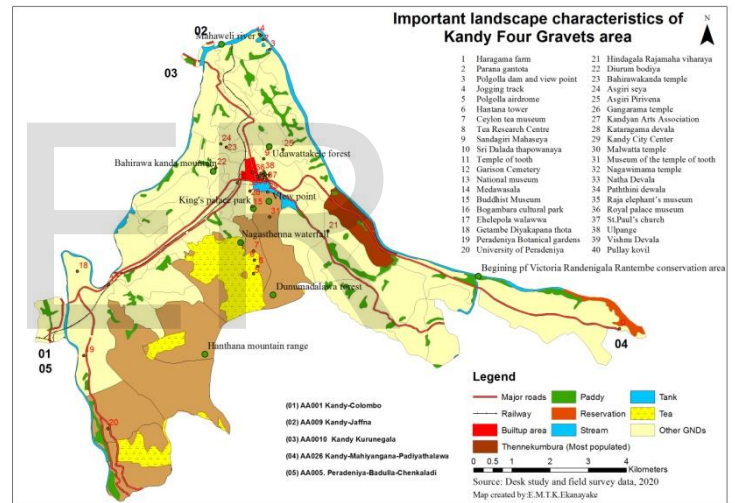


Figure 6: Important characteristics of the Kandy Four gravets area

Final landscape characteristics map of the study area

Several positive and negative findings were discovered at the end of the assessment. (Figure 6) On the positive note, this area is one of the most beautiful areas filled with trekking routes and it’s an environmental sensitive area. When examining about the hydrology of the study area, Hanthana mountains and Dunumadalawa forest area are the origins of most of the water sources. Due to the higher scenic values (likert scale 3.09) and the favorable cooler climate twisted with panoramic views of the mountains, most of the hotels and guest houses have been established in this area to attract both foreign and local tourists. The availability of Mahaweli River covering the study area from three sides provides beauty as well as acts as a natural boundary. It was found during the field survey that river expeditions are gradually becoming famous in certain sections of the river. The demand is more from the foreign tourists for these adventures.

The study area is blessed with two natural forests to be available within the boundaries. Dunumadalawa is a reserved area while Udawattakele is a forest visited by the locals as well as the foreign tourists.

A total of 48 natural and culturally important places were identified through the LCA. 16 of culturally important places and two natural places are located in this small GND area. These places are composed of religious buildings, parks, natural forests, ancient buildings and museums which attract most of the tourists, specially the holy temple of the tooth.

The legacy of being the last Sinhalese kingdom and the prevalence of the temple of tooth within the heart of the city, the history and folklore linked to the study area still prevails and being protected by the people. The typical Kandyan culture, epitome of Buddhism is still protected in the area which has enabled the city to become a UNESCO world heritage city.

On the negative note, it was found that, due to the population increase, the nearby Hantana mountain area has been encroached by the human habitats. During the field visits, it was noted that due to the improper stabilization of the slopes in hilly areas; some places have become highly vulnerable for landslides.

Moreover, it was evident after the field survey; there is a depletion of the forest covers and paddy areas in the study area. Most of the paddy lands have been converted to residential areas and the plot sizes have been drastically decreased.

Since the study area is geographically located in a plateau; the polluted air is stuck within the area, leading to higher air pollution in the city. Also due to higher entry of vehicles, availability of narrow roads, lack of public transportation facilities, and Kandy being a transportation hub, the traffic congestion is higher specially in this study area limits.

When looking at a development point of view, Kandy four gravets area is a unique area filled with development potentials.

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But considering the natural landscape, it is a very sensitive area. Furthermore, due to the area horizontal developments have been curtailed due to lack of space within the area. On the other hand, currently there are mass scale constructions happening within the study area and in the future, it will be hard for any more construction developments. Also, it was evident that, due to the increasing facilities with in the city, ([12]Kandy city Center, [15] multimodal transportation program etc) there will be a larger influx of population to the city. Therefore, planning needs to be done carefully.

One of the striking potentials identified during the LCA process was that the study area is full of potentials to develop tourism because the natural, cultural and visual landscape of the study area provides a better platform to develop tourism.

Conclusion

The study proves that LCA is a better tool to identify the landscape characteristics in any landscape. It also helps to identify the strengths, weaknesses, threats, trends and also opportunities that can be used to develop an area. Moreover, based on the availability of a perfect combination of natural, cultural and perceived landscapes, the tourism can be further developed in this area while incorporating each landscape characteristics identified. And the developments has to be done while improving the positive opportunities and minimizing the negativities.

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ⁱ GND= Small administrative division

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