

The Environmental Management of Cave Shelters: Special Reference to Rajagala Buddhist Monastery in Sri Lanka

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1. Introduction

The cave shelters have been commonly used by unitary establishments for the monks since ancient times. Having considered historical evidence, the monks were affectionate about staying in the natural cave to reside and to maintain a simple life according to the Buddhist code of discipline. The concept of cave shelters is mostly related to rock-cut or natural caves serving different purposes, such as meditation, ritualism, and accommodation for members of the Buddhist monks. Having considered those facts, Rajagala is the Buddhist monastic place where more than a hundred natural cave shelters spread out over 983 acres on the Precambrian inselberg in the eastern province, belonging to the dry zone. According to the literature and inscriptions, this site had been established by King Lajjitissa (119-109 BC), the eldest son of the King Saddhatissa (137-119 BC), during the Anuradhapura reign (Mahavansa, 1967; Deepavansa, 1970). The inscriptions state that the Kings and their followers had donated numerous caves to the monks for residence purposes (Paranavitana, 1970; Hettiarachchi & Dayananda, 2018). Most of the caves in the forest were being converted into dwelling places with some construction such as a foundation, floor, wall, window, and door using natural materials, such as clay, sand, stone flakes, and bricks, considering the existing environment, and they had tried to manage the small watercourses flowing through the caves, the landscape with trees and rocks was enhanced to add spiritual condition to space. Slight research has been done so far on the eco-friendly concept in architectural features and environmental preservation management of the monastery (Rajapaksha and Nandasiri, 2016; Karunarathna, 2023), but this research conducted on how the environment leads to spiritual development has been conducted to a lesser extent; therefore, the research aim is to discuss the impact of the environmental characteristics was considered to arrange caves as the residence places for the monks.

2. Materials and Methods

This research was carried out according to qualitative and quantitative methods including the field survey and literary sources. 83 cave shelters have been surveyed according to the base map of the site, considering the main four directions of the entire area. Each cave monument is documented by using GPS Magellan eXplorist 310 and 510 GPS to take the coordinates (N⁰E⁰) and a Bosch Laser Distance Meter GLM 30 has been used to take measurements of the features of the caves. The available physical topographies on each cave have been recorded using a prepared document in Microsoft Excel for analysis purposes; the geographical location, rock, forest type, nearest water resources, distance from the water supply, and types of raw materials to be built the cave-dwelling are included in the datasheet. All statistical records are analyzed using Microsoft Excel and GIS; other physical features are classified from content and thematic analysis methods.

3. Results And Discussion

Environmental management is the practice of organizing human activities to limit their impact on the natural environment; it can encompass the protection of the land, flora, fauna, and bodies of water (Safeopedia, 2024). Several uses of this concept were identified in cave shelters in Rajagala premises (Fig.1). Rajagala inselberg can be seen as natural rock shelters that were extensively used to prevent weather conditions, therefore, those caves were converted into living places by pre-historic men, and then members of the different faiths in the historical period, especially Buddhist monks, were widely used as monasteries during the early Anuradhapura period, especially 2,300 years B.P. Rajagala forest, part of the Nuwaragala reserve, is classified into tropical dry monsoon (mixed evergreen); apart from the western area, the eastern part where the caves are more widespread, is covered in high dense forest; the landscape is conceptually managed without massive interference with the rocks scattered around the cave dwellings made of granitic gneiss, those transform into a spiritual place, adding further values to the ecological factors.

Cave architecture with very minor interventions, such as removing stone flakes from shelters, had been made, and it was expanded with additional features such as the foundation, floor, wall, roof, and drip ledge, and was constructed more wisely with natural raw materials while respecting the surrounding environment. Most of the walls and foundation were made of stone flakes which were collected from the environment, and during cave creation, furthermore, clay and sand were widely used as binders, which were collected near the site, according to the sand particles, all are composed by the near streams (Abeynayake et al., 2023).



Figure 1. Rajagala archaeological reserve and distribution pattern of the cave shelters

Furthermore, streams (small canals) can be seen near 34 caves, which become active during the rainy season, and which water sources remain after the rainy season at least for three months, but in some places, water collected in the form of the wet patch in the lower valleys, small streams flow through some caves during the year, those water sources had been managed for their daily water consumption (both dining and bathing), 'cave number 60' the water drainage made of stone on the inside to collect and distribute water for drinking purposes. According to the inscription, King Lajjathissa had established twenty-five cool caves (natural air condition wind blows through the rocks where the water flows) for the monks (Paranavithana, 1970), yet, only two of the caves (named Dattha and Dammaruchi) can still be seen, 68 caves were facilitated with one more drip ledge to manage rainwater, and Shamika cave has 18 drip ledges put on the façade to control the rainwater to make a better living place for the monks.

The surrounding environment conservation concepts were discussed in the philosophy of the Buddhist doctrine (Theragāthāattakathā, 2008; Visuddhimārgaya, 2009). Monks always thought of maintaining the physical environment for mental relaxation (Chullavaggapali, 2005). At the same time gardens were used for monasteries; they were also approved by the Buddhist doctrine and always contained awareness of the environment and its use. Considering the Rajagala premises, monks had used rock shelters and its suburbs with the knowledge of environment management related to the philosophy of Buddhism during the 3rd century, BC to 10th century AD.

4. Conclusion

The monk, who had resided in the cave premises for a long time, managed the surrounding environment with the experience of traditional living style. The rock shelters were extensively used to prevent weather afflictions, and they were continuously prepared properly to reside since ancient times, therefore, cave shelters were the most suitable habitat the natural environment had not been greatly altered, nevertheless, only managed to accommodate where they were, for the monks who followed the lonely and simple lifestyle according to Buddhist doctrine, for thousands of years, the monks who lived in cave monasteries had a good understanding of the physical features of the caves and the surrounding environment to fulfill their minimum needs. Future research should elucidate the scientific background to the selection of methods to keep the cave interior cool based on environmental factors.

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6. Keywords

Cave, Environment, Management, Buddhist doctrine

7. References

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