IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

ART AND ARCHITECTURAL REMAINS OF VAITAL DEULA, BHUBANESWAR: A GIS-BASED STUDY

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Abstract

The Vaital Deula is one of the most famous Tantric temples in Odisha. It is dedicated to Goddess Chamunda and follows the unique Khakhara order of Kalinga architecture. The temple is known for its semi-cylindrical shape, complex sculptures, and strong connection to Tantric religions. The current study looks into the study of art, architectural parts and sacred landscape setting of the Vaitala temple. To understand the sacred geography of the Vaitala temple the present study use QGIS tools for georeferencing, spatial mapping, GPS-based documentation, buffer analysis, and Digital Elevation Model (DEM) maps are prepared and interpreted to understand the relationship of the temple with the landscape. The study shows the connection of Vaital Deula to the larger sacred urban network of Bhubaneswar, which includes nearby temples and water bodies used for rituals.

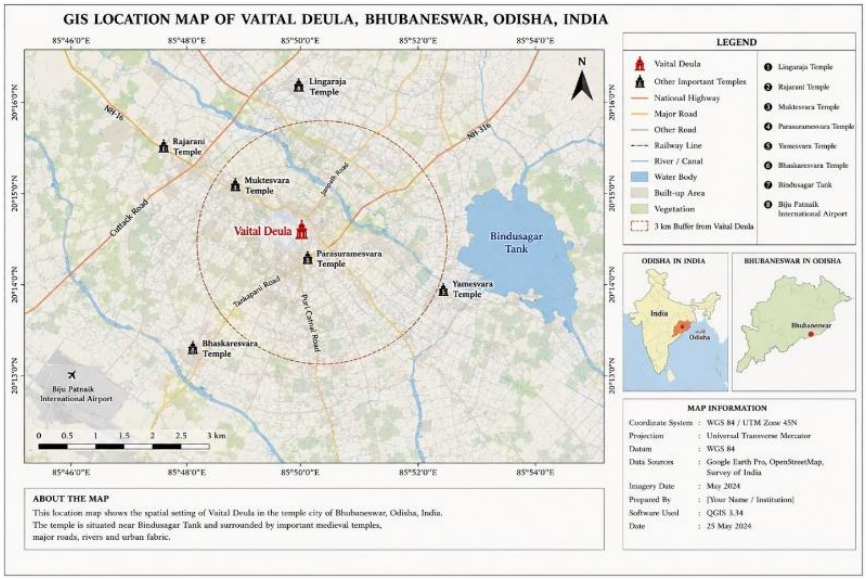
Keywords: Vaital Deula, Bhubaneswar, GIS, Khakhara Architecture, Sacred Geography

Introduction

The Vaital *Deula* located in Bhubaneswar is renowned for its distinctive *Khakhara* architectural style and Tantric religious practices. It is devoted to Goddess Chamunda and is renowned for its excellent architectural carvings and sculptural remains (Panigrahi, 1986). The temple is situated at 20.242360 latitude and 85.832323 longitude in the old town of Bhubaneswar. The surrounding area features numerous ancient temples and historical artefacts that represent the rich cultural heritage of Odisha. The present study employs Geographic Information System (GIS) to analyse different spatial aspect including the architectural remains of Vaital Deula. Geographic Information Systems (GIS) enable the mapping of temple locations and the analysis of their spatial relationships with adjacent monuments and cultural attributes (Lock, 2003).

Study Area

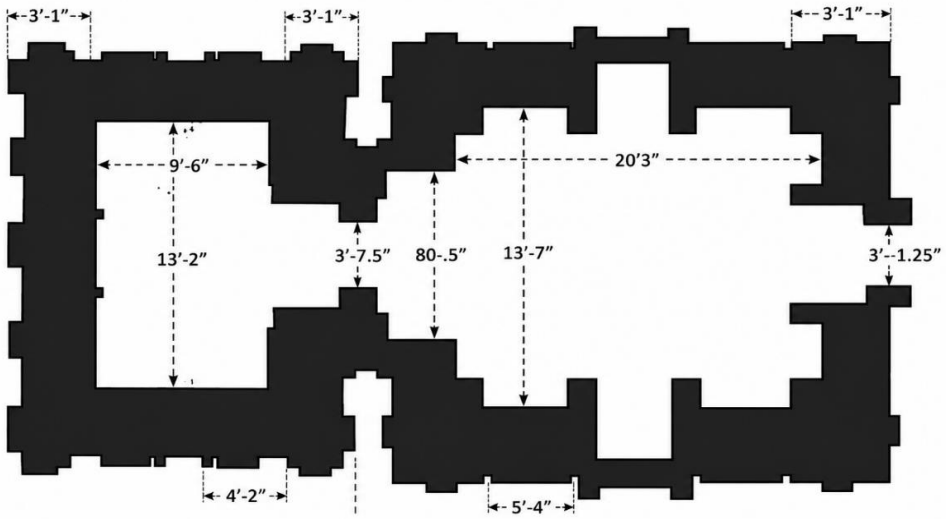
This study is mostly about Vaital Deula (Baitala Deula), which is in Bhubaneswar Old Town. The temple is close to the holy Bindusagar Lake and is an important example of early mediaeval Odisha temple architecture (Behera, 1993). There are many historic temples, holy tanks, traditional settlements, and places for rituals that make up the cities as a cultural landscape. The study area was selected because it has historical and architectural value. GIS tools, like spatial mapping, GPS survey, and buffer analysis, were used to study the temple and the sacred land around it in order to figure out what it meant culturally and geographically (Lock, 2003) (Figure-1).



(Figure-1: GIS Location Map of Vaital Temple)

Historical Background of Vaital Deula

Vaital is one of the most important temples in Bhubaneswar and is also known as Baitala Deula or Tini-Mundia Temple (Senapati, & Sahu 1968). The temple was built around the eighth century CE, during the Bhauma-Kara period. During this time the Tantric forms of Shaivism and Shaktism became very important in Odisha. The monument is for Goddess Chamunda, who in Tantric traditions is an aggressive form of the Mother Goddess. The deula or tower is characterized by a semi-cylindrical in shape, much like the Dravidian gopuram of the South Indian temples. The name "Vaital" is thought to come from the words "Vaitala" or "Vaitalu," words associated with this unique architectural form found in Odisha (Figure-2).



(Figure-2: Vaital Temple Ground Plan (after Donaldson))

The history of the temple shows how important Tantric religion was in Odisha in the early Middle Ages. Shakti worship was very important during this time, as shown by the sculptures of Chamunda, Bhairava, Mahishasuramardini, and the Matrikas. The temple shows how artistically advanced Odisha temple architecture has become with its fine sculptures, beautiful pilasters, chaitya windows, and classically modelled figures. Bhubaneswar's sacred architecture includes Vaital Deula and temples like

Lingaraja Temple and Mukteswara Temple. The temple is still important for learning about Odisha art, architecture, iconography, and Tantric religions (Das, 1982).

Methodology

This interdisciplinary study examines *Vaital Deula* spatial organization and artistic remains using Geographic Information System (GIS) techniques for art-historical and architectural analysis (Lock, 2003; Michell, 1988). Primary and secondary data were used for this research. Systematic field surveys, architectural observation, photographic documentation, GPS-based location recording. Secondary data were collected from archaeological reports, historical literature, scholarly publications, satellite imagery, and topographical maps.

Field investigation spatial data was georeferenced and processed using QGIS. A geospatial database was created to map the temple complex's architecture, sculpture. Buffer analysis, spatial correlation, and nearest neighbour analysis were used to assess the temple's relationship to the sacred landscape of Bhubaneswar (Lock, 2003).

The architectural investigation focuses on the temple's *Khakhara* typology, elevation pattern, decorative programs, constructional features, and Tantric iconography. Comparisons with other early medieval Odisha temples were done to determine stylistic continuity and regional variation. Integrating GIS-based spatial analysis with traditional architectural study provides a systematic and scientific framework for understanding *Vaital Deula* cultural landscape, spatial logic, and artistic significance within Odisha's temple heritage.

Architectural Features of Vaital Deula

The *Vaital Deula* is a unique structure located in the same compound of the *Sisiresvara* temple (Donaldson, 1985). The Vaitala temple is built after the *Sisiresvara* temple and probably the same artisans have repeats many of the architectural motifs and design elements on the walls of the Vaitala temple. These are well executed with much more refined, advanced level of craftsmanship. Structurally, the temple is built in the *khakhara* style, meaning its main tower features a distinctive barrel-vaulted roof like a wagon top, which visually sets it apart from typical conical temples. The overall design consists of two primary parts: the main inner sanctum housing the deities, and a flat-roofed assembly porch called the *jagamohana* attached directly to the front (Figure-3). The outside decorative program of the temple is intentionally designed to emphasize the female divine principle, reflecting its dedication to the *sakta* and tantric traditions. The major subsidiary niches along the outer walls feature prominent carvings of goddesses like *Mahisamardini* and *Parvati*, while male deities are virtually excluded. In front of the assembly porch, the physical remains of a *yupa*, or a sacrificial stone post is noticed, which confirms the temple's association with Tantric ritual practice (Chand, 2005).

(Figure-3: Vaital Temple Bhubaneswar)

Architecturally, the temple also speaks about a story of a sudden historical disruption, while the main tower is beautifully complete, the decorative artwork on the outer walls of the *jagamohana* is only roughly carved out. The incomplete or rough art work tells that the carvers might have been forced to stop their work mid-design, due to foreign invasions and political chaos that hit the region at the start of the 9th century.

Chamunda Mother Goddess

Vaital Deula is mainly dedicated to Mother Goddess Chamunda, a powerful form of Goddess Shakti in Hindu religion (Mishra, 2009; Bose, 1932). She is worshipped as a goddess of strength, protection and destruction of evil forces. The image of Chamunda in the temple depicts the strong tantric tradition of the early mediaeval period of Odisha. The idol of Chamunda is carved in a weird and aggressive form. She is shown as a thin figure with deep eyes and a serious expression, representing the power of life and death. In many representations the goddess stands above a body which represents victory over fear, ignorance and evil. She is decorated with garlands of skulls, ornaments and weapons that testify to her powerful nature. Animals such as jackals and other symbolic figures are also found in the vicinity of the deity, connecting her with Tantric beliefs and cremation-ground symbolism.

The sculpture of Chamunda is religiously as well as creatively important. The carving work on the deity speaks of the high skill of the Odishan temple artists (Bose, 1932). The sculpture is unique and attractive because of the details of jewellery, hair style, dress and facial expression. The temple walls are adorned with the carvings of attendants, dancers and divine figures which add to the beauty of the temple. The image of Chamunda at Vaital Deula gives us an idea of the religious ideas, artistic traditions and cultural life of ancient Odisha. Some parts of the sculpture are weathered and damaged over time but the carvings that are left behind show the richness of Odishan temple art and architecture.

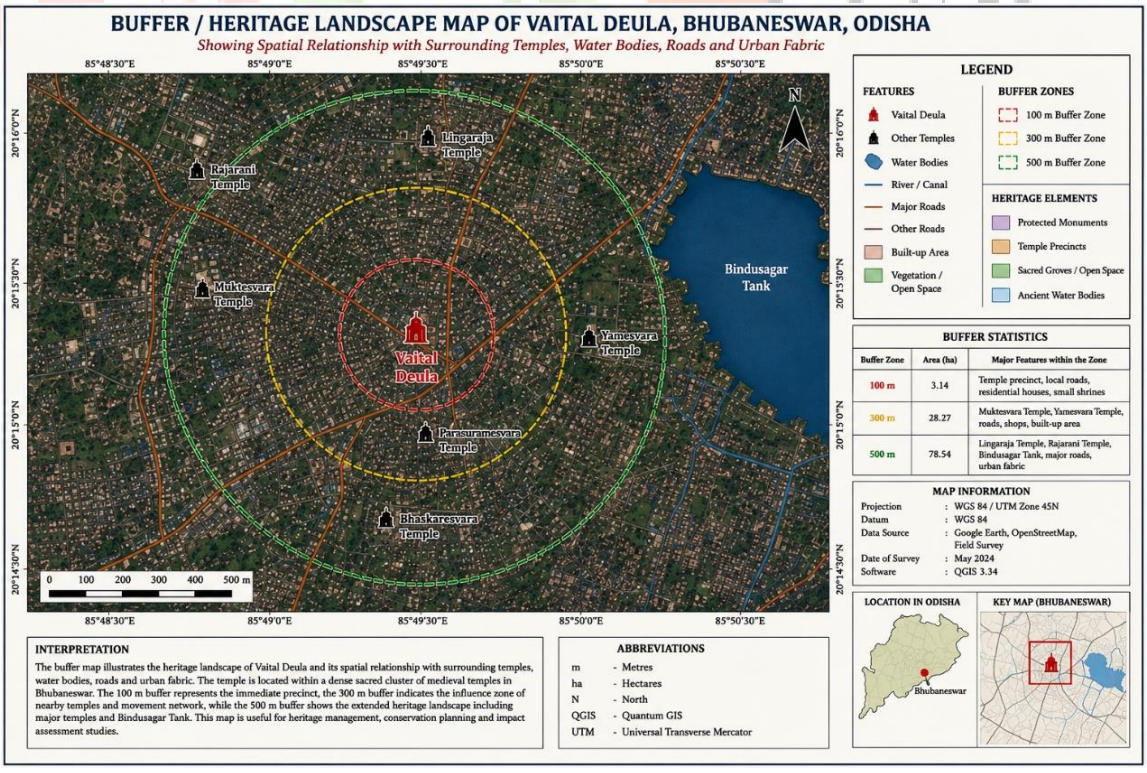
Scope and Limitations of The Study

The present study investigates the art, architecture and spatial organization of Vaital Deula through the use of Geographic Information System (GIS) techniques and architectural analysis (Lock, 2003). The study deals with the *Khakhara* style of architecture of the temple, its sculptural remains, iconographic representations and spatial arrangement within the sacred landscape of Bhubaneswar. Analysis of the distribution of architectural and artistic elements have been performed with the use of GIS tools like spatial visualisation, spatial correlation and buffer analysis (Lock, 2003). The study also contributes to the heritage documentation and provides a scientific framework to understand the cultural significance of the monument. But the research is largely confined to the visible architectural and sculptural remains of the temple and its immediate surroundings. The study is mainly based on field observation, GPS survey, satellite imagery and available historical records (Lock, 2003). The weathering, structural damage and loss of sculptural detail also make accurate interpretation difficult.

Buffer and Heritage Landscape Study of Vaital Deula

The buffer and heritage landscape analysis of Vaital Deula was done with the help of Geographic Information System (GIS) techniques to know the spatial relationship of the temple with its surrounding sacred environment (Lock, 2003). To create a buffer map around the temple, QGIS software was used to prepare the buffer zones of 100 m, 300 m and 500 m (Figure-4) around the temple complex. The analysis helps to detect the distribution pattern of the nearby temples, water bodies, roads, settlement pattern and other cultural features associated to the historic landscape of Bhubaneswar.

The spatial analysis shows that Vaital Deula is sited within a tight cluster of early mediaeval temples and sacred monuments, pointing to its significance in the religious and urban landscape of ancient Bhubaneswar. The important temple like Muktesvara Temple, Rajarani Temple and Lingaraja Temple come under the heritage influence zone (Fergusson, 1910). The presence of Bindusagar Tank and its associated sacred water systems also adds a further layer of ritual and cultural significance to the landscape (Senapati & Sahu, 1968).



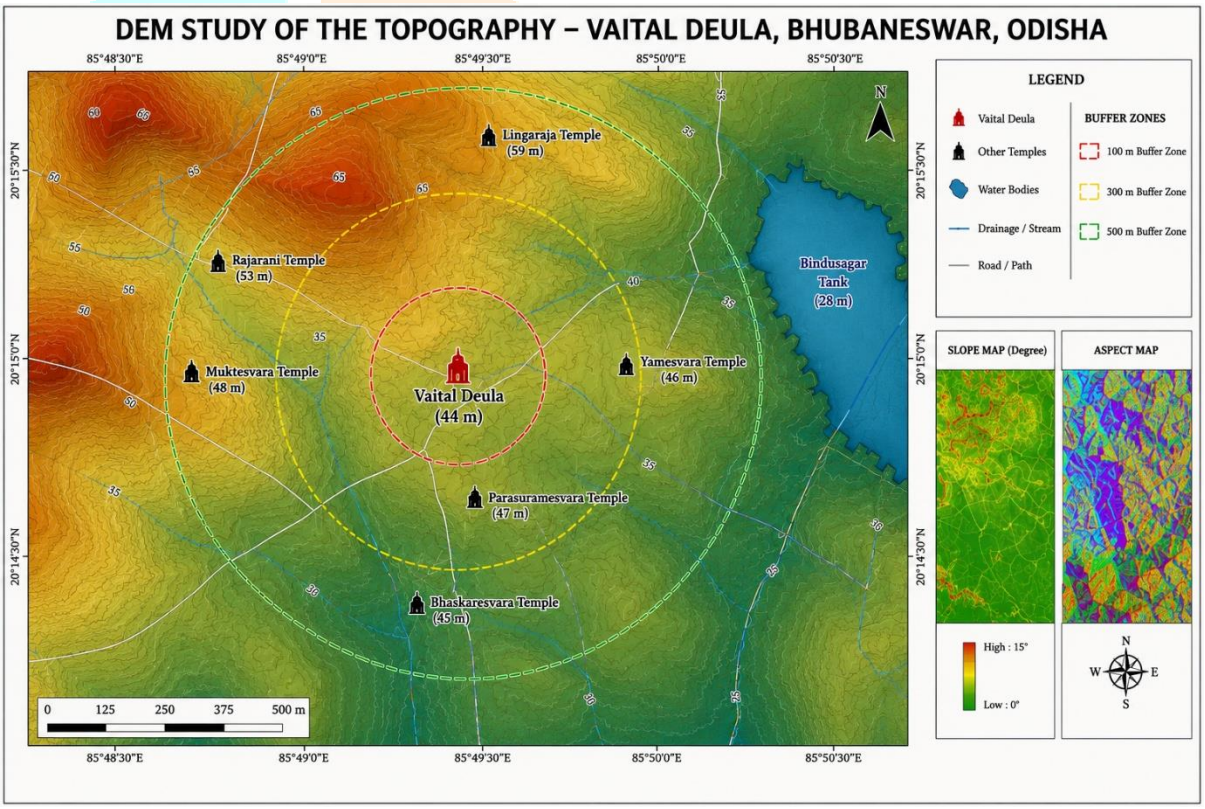
(Figure-4: Buffer Map of Vaital Temple Bhubaneswar)

The buffer analysis further demonstrates the interdependence of temple networks, pilgrimage routes, and settlement growth patterns. Around the temple, the roads and paths that show evidence of past accessibility and ritual movement within the sacred urban centre. The GIS-based heritage landscape assessment provides valuable insights into cultural heritage documentation, conservation planning and sustainable management of the historic temple environment.

DEM Study of the Topography

Digital Elevation Model (DEM) of Vaital Deula was studied using GIS techniques to understand the land surface and topographical features around the temple (Lock, 2003). DEM data from satellite sources were processed using QGIS to examine elevation, slope, drainage, and surface patterns of the surrounding area. This analysis is helpful in understanding the impact of natural landscape in terms of the location and development of the temple.

The study reveals that Vaital Deula is situated on a comparatively higher ground in the historic temple landscape of Bhubaneswar. The land surface together to this is gently sloping, with the lower areas noticed around water bodies like Bindusagar Tank. The topography seems to have been an important factor in the location of temples, roads and settlements in the region (Senapati & Sahu, 1968). Drainage patterns also show the importance of water systems in the historical environment (Figure-5).



(Figure-5: DEM Map of Vital Temple)

DEM analysis is very useful to understand the relation between natural landscape and temple architecture (Lock, 2003). It aids in understanding the environmental setting of Vaital Deula and helps in heritage documentation, archaeological research and conservation planning through scientific spatial analysis.

Conclusion

The present study of Vaital Deula indicates the significance of Geographic Information System (GIS) techniques with art-historical and architectural analysis for the comprehension of sacred heritage landscapes. The research shows that the temple is a major hub of Tantric religious tradition in early

mediaeval Odisha and a significant example of *Khakhara* style architecture. A detailed study of the architectural elements, the sculptural remains and the spatial organization reveals the artistic richness and the cultural importance of the monument.

The relationship between the temple and its surrounding sacred landscape was identified using GIS-based methods such as buffer analysis, spatial mapping, and DEM analysis. The sacred landscape includes nearby temples, water bodies, roads, and settlement patterns. The findings indicate that the positioning and configuration of Vaital Deula were intimately related with the natural topography and religious environment of Bhubaneswar. The study also demonstrates the usefulness of GIS in heritage documentation, spatial understanding and conservation planning. The research combines traditional architectural study with modern geospatial technology, to provide a scientific approach for the analysis of historical monuments and cultural landscapes. This interdisciplinary study thus contributes to a better understanding of the creative, architectural and spatial significance of Vaital Deula in the temple heritage of Odisha.

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