

Engineering and Technology Quarterly Reviews

Yuli, N. G., Rahmat, F., & Maharika, I. F. (2024), Defining the Contextuality around Heritage Site to Maintain Cultural Sustainability. In: *Engineering and Technology Quarterly Reviews*, Vol.7, No.1, 1-9.

ISSN 2622-9374

The online version of this article can be found at:
<https://www.asianinstituteofresearch.org/>

Published by:
The Asian Institute of Research

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Defining the Contextuality around Heritage Site to Maintain Cultural Sustainability

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Abstract

Addressing pressing contextual issues related to settlements near world heritage sites is imperative. Preserving a settlement's unique identity and maintaining a sense of place and cultural sustainability in the area is crucial. This paper aims to explore the contextuality of Borobudur Temple and examine how the existing conditions support its contextuality. Our research focuses on the roof styles and motifs of the area, and we interpret contextuality through relief readings. To assess the contextual factors of the existing buildings along the Balaputeradewa corridor, we used matrix analysis and concluded how the context of recent buildings affects the area. Our findings indicate that variations in roof styles and motifs are crucial considerations for cultural sustainability. While some existing buildings reflect these findings, others are out of context. Moreover, some contexts in relief are outside the research area. These findings can be utilized to develop strategies for cultural sustainability in both rural and urban areas, especially in maintaining the area's sense of place.

Keywords: Contextuality, Relief of Borobudur Temple, Roof Style and Motifs, Cultural Sustainability

1. Introduction

1.1 Cultural Sustainability in Sustainable Development

UNESCO identifies four critical dimensions of sustainable development: society, environment, culture, and economy. Cultural considerations must be taken into account. Cultural offerings such as tourism, food, and handicrafts have the potential to contribute significantly to economic growth. Moreover, cultural sustainability is an essential component of sustainable development, as it enables the preservation and enhancement of important values and attitudes in the face of external pressures.

Cultural sustainability is intricately linked to the concept of a "sense of place". This term refers to the unique life experiences that are associated with a particular location (Graham et al, 2009). A sense of place is defined by the specific characteristics of a space that give it an identity, and it can be recognized through these qualities. These qualities are influenced by three main factors: the physical form of the space, the activities that take place there, and the meanings that are associated with it (Lynch, 1960). While everyone may have a different sense of place

for a given location, all of these meanings are rooted in the physical elements of the space and the individual's experiences there (Hasbullah, 2021).

Academic literature employs the sense of place in two distinct ways. Firstly, it is utilized as a *genius loci*, exploring the various elements that contribute to the local character, such as topography, cosmology, the built environment, and the emotional and psychological connections that people have with the place. Secondly, the sense of place is used in life experiences to comprehend how a particular place influences one's identity (Shamai, 1992). The significance of physical elements and related concepts in the definition of place cannot be overstated. While physical features exist as an objective reality of space, they are only one of three known components of place: physical context, activity, and meaning (Carmona, 2013).

The spirit of place holds both physical and non-physical strengths that can leave a lasting impression on a city (Mutfianti & Soemardiono, 2009). The interdependence of past traditions, identities, and perceptions of time travel is reflected in the contextual nature of buildings and urban landscapes. Attention to contextuality is crucial in historical sites to avoid a disconnect between old and new identities and to preserve the value of the spirit of place (Ostanevics, 2017). The root of the word "context" comes from the Latin verb *contexere*, meaning "weave together, weave, join, write" (Hufford, 2003). Context refers to the state that sets the stage for an event, statement, or idea in a fully comprehensible sense (Oxford, 2021). Additionally, context can be defined as a combination of phenomena, circumstances, facts, events, and settings that form a broader whole, background, environment, or framework (Cizgen, 2012).

City development is important in terms of time adjustment, but by directing, it is expected to provide the best results for the whole connected city. This is because contextualism in architectural design aims to create unifying relationships and dialogues, an idea that aspires to move coherently in its entirety while carving out a niche for itself. The starting point for designing in context is the evaluation of the existing structure and the conclusion that the existing structure is considered important for urban urbanism (Ostanevics, 2017). And or the purpose of contextual architecture is to preserve the natural beauty of the site through careful design that relates to the surrounding Woldford in (Zhou & Zhang, 2015).

Context cannot be understood as standard or inviolable but must be interpreted, manipulated, changed, or rediscovered during the architectural design process (Dağlıoğlu, 2015). Respect for context and contextual design always tries to connect new architecture with that already exists, thus encompassing it in overall sustainable progress (Feisal, 2019). Contextualism is considered to achieve aesthetic fitness for the preservation of historical areas (Sotoudeh & Abdullah, 2012), such as the importance of an interdisciplinary approach in an interactive framework involving architecture, urbanism, and restoration in a case study of development in a historical context in the Tabriz Bazaar Complex, Iran (Gharebaglou et al, 2019).

The role of urban development in adapting to changing times cannot be overstated. By strategically directing development efforts, the best possible outcomes can be achieved for the entire interconnected city. Contextualism in architectural design is key to achieving this goal. Its focus is on fostering cohesive relationships and dialogues that enable the city to move forward as a whole, while also creating distinct spaces that are unique in their own right. To begin designing within a specific context, it is crucial to assess the current structures in place. These structures hold great significance in urban planning, and contextual architecture strives to maintain their inherent charm through thoughtful design that complements the surrounding landscape. Nonetheless, it is essential to understand that context is not necessarily fixed and may require interpretation, manipulation, alteration, or rediscovery throughout the design phase. Valuing context and contextual design involves integrating new architecture with existing structures to promote sustainable progress. This approach is especially crucial for preserving historical areas. A multidisciplinary approach that incorporates architecture, urbanism, and restoration is essential, as demonstrated by a case study of development in the historical context of Tabriz Bazaar Complex in Iran.

Contextuality can be divided into four categories (Cizgen, 2012; Mirhallaj, 2016): 1) visual/physical context, 2) formal/climatic context, 3) human/historical context, and 4) sociocultural and economic context. Among these categories, the visual/physical context offers a comprehensive overview of an area's unique contextual identity.

In this case, the design interprets and applies elements such as size, scale, rhythm, mass, and the use of colors and materials in a compatible manner with surrounding buildings. The types of contexts are time, space, and people. The context of time consists of technology and the economy. The context of space consists of geophysical and climate. Meanwhile, from the geophysical context, it consists of buildings, monuments, and landscapes. Furthermore, in the context of people, it consists of perception, needs, and tradition. Sanghvi provides several criteria that need to be considered to build in context, namely: order, scale and proportion, color, materials and texture, symmetry, rhythm, and details (Sanghvi, 2017).

To ensure a harmonious integration of new designs into historic environments, a set of guidelines has been established. These guidelines emphasize the importance of ensuring compatibility with various aspects of the environment such as height, street line, facade composition, rhythm, and pedestrian experience. Additionally, attention should be paid to the correlation between the facade and the context with regards to massing, sitting, height, setback, orientation, rhythm, material, color, and scale. Designers must also consider the character, scale, form, sitting, materials, color, and detailing of the historical environment. Finally, there are five building conditions and their contexts, which include homogeneous, similar, different, contradictory, and diametrically opposed.

2. Method

The research conducted in this study utilized a qualitative descriptive methodology. A narrative review of past research on relief in the Borobudur temple was used to establish the context of the research area. The study collected and analyzed various interpretations of the relief in the temple, particularly those related to the roof style and its motifs. These interpretations were based on leading theories about contextuality (Alliance, 2007; Ostanec, 2017; Beamer, & Pidcock, 2005). The roof was chosen as a focus because it is an important element of a building that affects its physical shape, such as its height, street line, facade composition, scale, and massing. The researchers then used contextuality variables to assess the extent to which the existing research area was contextualized. The corridor of Balaputeradewa was chosen because it had undergone significant changes and was located near the Borobudur temple. Additionally, many building developments in this area were driven by the financial background of residents. The researchers analyzed 137 buildings using contextuality variables in different groups of research findings. The study focused solely on analyzing the roof style and motif on relief, comparing it to the existing conditions collected through visual corridor survey techniques. Matrix analysis was used to assess the contextuality of the research area along the corridor. Analyzing roof style and motif on relief and comparing it to existing conditions collected by visual corridor survey techniques. Matrix analysis was used to assess the contextuality of the research area along the corridor.

3. Results and Discussion

3.1 Existing condition in Balaputeradewa corridor around Borobudur Temple

There were 137 buildings to assess to get how the context of existing condition, along corridor of Balaputeradewa, both on south and north side of corridor.

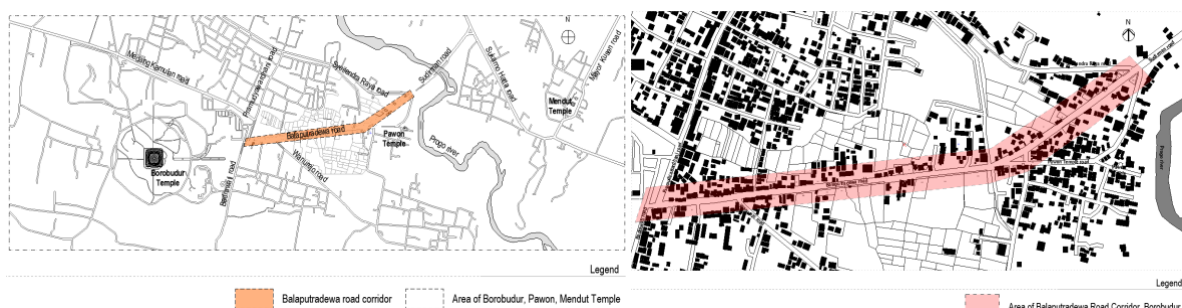


Figure 1: The context of research area and Borobudur temple (left) and research area (right)

Source: Rahmat, 2022

The existing condition, the corridor consists of a rice field area, a commercial area, a public garden, and private houses (figure 1). Most of the buildings have been changing from their original shape to the recently needed shape, i.e., commercial facade. Less than 50% of the total building looked like to consider the context of Borobudur temple. Some of the empty lands have a big potential to develop a new building, and the chance to refer to the context is pessimistic so far.






Figure 2: Spatial zone along Balaputeradewa corridor








Redraw by Rahmat, 2022

3.2 Findings of architectural style, motifs, and themes in relief of Borobudur temple

In the discussion of Javanese vernacular architecture depicted on The *Karmawibhangga* relief panels, various forms of roofs, walls, foundations, building functions, and materials are identified. Notably, the shape of the roof stands out as the most prominent feature from an architectural perspective. Hardiati and Priatmodjo grouped the identified roof shapes into three categories: shield, saddle, flat, bell, curved, and danted roofs, often made with leaves or grass. The shape of the wall follows the function of the building, with residential houses being closed and meeting places, palaces, and courts being open to the public. The relief panels also reveal two main types of buildings: temples and residential houses, with stone pedestals and wooden poles commonly used for foundation elevation (Hardiati & Priatmodjo, 2008). Table 1 showcases recent research on the Borobudur temple relief panels, contextualizing the surrounding area and illustrating the diversity of roof styles and building functions.

Table 1: Relief in Borobudur Temple which draw the Contextuality of Building

No	Roof style	Relief
1	The O30 panel scene identifies the building with a shield roof shape (front) and a gable roof (back). The function of the building as a temple.	
2	Panel scene O158 identified a building with a perisan roof, functioning as a sanctuary (sanctuary)	
3	Panel scene O47 identifies a residential house with a shield roof (in the middle) and a gable roof (on the side).	

4	Panel scene O65 identifies a residential house with a gable roof for a person (left), the house on the right is identified with a slightly curved gable roof (bell), an open wall with the function of a semi-public building for many people (right).	
5	The panel scene O128 identifies a building with a flat roof that functions as a public building where important people meet, the walls are open	
6	The panel scene O129 identifies a building with a roof shape (Bell), which functions as a place for the royal palace, the walls are open.	
7	The O76 panel scene identifies a building with a bell roof with a function as a place to try guilty people, the walls are open.	
8	The O88 panel scene identifies a building with a curved roof shape like a stupa with the function of a building in hell.	
9	One of the panel scenes identified the shape of a curved roof with the function of meeting people (perhaps the royal court), the walls are open	
10	The relief panel scene identified a building with a sunken roof with a stupa crown, functioning as a temple.	

Roof style that drew in Borobudur temple can conclude in table 3 as the group of roof style that open the possibility to analyze the context around Borobudur.

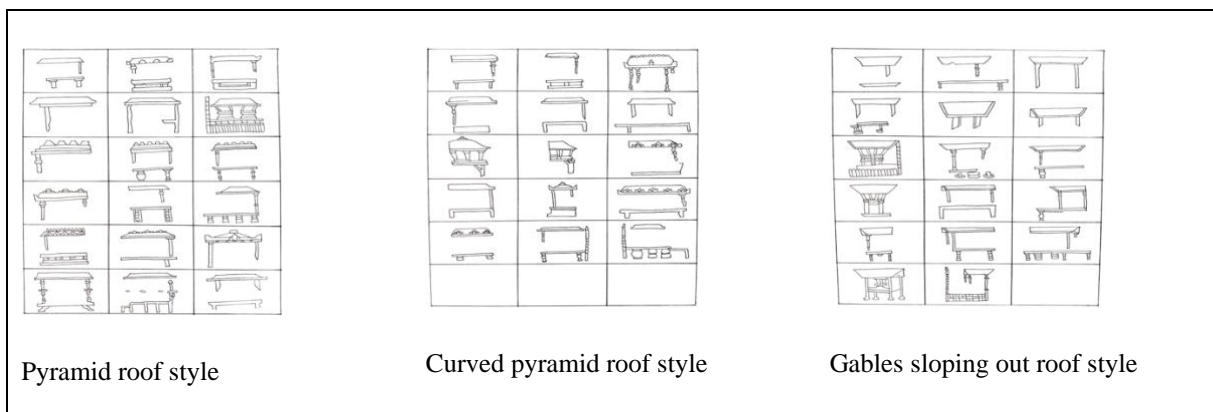


Figure 3: Roof style interpretation from relief

The research assessed the existing roof style to the roof style in relief. Some of roof style used saddle type and shield type.

Table 2: Roof assessment refers to the roof types in relief of Borobudur.

Roof style	Qty.	Code of building									
		1	2	3	4	5	6	7	8	9	10
Shield style.	10	U1	U5	U6	U9	8	2	3	9	6	2
		U3	U4	U5	U6	U7	U7				
		U53	U54	8	U60	2	2	3	S80	S86	S90
		S92	S95	S1	S109	S1	S1	S12	S13	S12	S12
				03		17	27	8	6	4	3

		S82	S132								
Saddle style.	64	U2	U3	U4	U7	U8	U1	U1	U1	U1	U1
				U1		U2	U2	U2	U2	U3	U3
		U15	U16	7	U21	4	5	6	8	0	1
				U3		U4	U4	U4	U4	U4	U5
		U32	U33	5	U38	1	2	3	8	9	0
				U5		U7	U7	U7			
		U51	U57	9	U70	1	4	5	S81	S83	S85
				S9		S9	S9	S10	S10	S10	S10
		S87	S93	4	S97	8	9	0	1	7	8
				S1		S1	S1	S12	S12		S13
S111	S118	19	S120	21	26	9	5	S91	1		
		U4									
		S134	S110	0	S135						
Plat style	2	U19	U36								
Bell style	0										
Curved style	0										
Dented style	0										
<i>Panggung Pe</i> style	9	U27	U56	U6	U63	U6	U6	U7	S13	U4	
Shield and saddle combination	5	U64	U65	U4	U55	S8	9				
Shield and flat combination	1	S116									
Unidentified	2	U20	U29								
Landscape (no building)	22	U34	U37	U4	U66	U6	U7	U7	U7		
				S1		S1	S1	S11	S11	S11	
		S96	S102	04	S105	06	12	3	4	5	
		S137	S133								
Total	137	S: South side of corridor; U: North side of corridor									

Table 4 summarizes the function of each roof type. The prevalent roof styles for houses are shield and saddle roofs. However, for public buildings such as palaces, courts, stupas, and temples, there is a variety of roof styles including flat, bell, curved, danted, and *Panggung Pe* styles. This discovery suggests that public buildings in the vicinity of Borobudur have many different roof variations, which contribute to the sense of place in that area during ancient times. Only two simple roof types, shield and saddle, are used for houses. This is likely because as private properties, houses do not play as significant a role in defining the sense of place for the area.

Table 3: The building function of each roof style

Roof Styles	The Building Functions
Shield roof style	House, religious activity
Saddle roof style	House
Flat roof style	Public building with open wall
Bell roof style	Palace, court, <i>stupa</i>
Curve roof style	Public building (palace)
Danted roof style	Public (palace/ temple)
<i>Panggung Pe</i> roof style	Public

For the motif on each roof style, stated in table 4

Table 4: Variation of roof motifs in Relief

No	Variation of roof motif
1	Plain motifs
2	Vertical block motifs
3	Wreath and tassel ornament motifs

3.3 Analysis of the contextuality in existing building

This segment will evaluate the contextual nature of the research zone. Among the 137 structures lining the path of Balaputeradewa, 116 are tangible edifices while 21 constitute landscape garden fences, sculptures, gates, gardens, rice fields, and farm areas. The tabulated data below pertains to the examination of roof styles, which directly correlates to the discoveries made in Borobudur relief.

Table 5: Analysis of recent roof style in Balaputeradewa

Roof Styles	Total buildings
Shield roof style	32 buildings
Saddle roof style	66 buildings
Flat roof style	2 building
Bell roof style	0
Curve roof style	4 buildings
Dented roof style	0
<i>Panggang Pe</i> roof style	9 buildings
Combination of shield and saddle style	4 buildings
Combination of shield and flat	1 building
Not identified	2 buildings

Two buildings remain unidentified due to the recent addition of a facade obscuring their original roof structure or form. Regrettably, current research cannot identify roofs with distinct bell, curve, or dented styles within the existing building typology. In terms of roof motifs, plain motifs were used in 90 buildings, vertical block motifs (antefix) in 26 buildings, while garland and tassel motifs were not used in any buildings. The inclusion of unique roof types in a building's design can present challenges when developing a contextual strategy for its new function. In today's world of franchised businesses, specific building designs, motifs, and interior decor are often pushed forward. However, without proper regulation, this phenomenon could make it difficult to achieve cultural sustainability around heritage sites. To maintain the sense of place around the Borobudur temple in Balaputeradewa, corridor development strategies must be considered in governmental public policy. This includes regulations for building design, such as roof styles and motifs, and building improvements that align with the context of Borobudur itself. As such, the study of roof styles and motifs is one of many ways to understand the context of the Balaputeradewa corridor.

Borobudur's relief was utilized in the analysis due to gaps in regulations concerning the architectural style of buildings around the area, such as the UDGL of Borobudur and the Government law about National Tourism Strategic Area (*Kawasan Strategis Pariwisata Nasional – KSPN*). While there are buildings around the

Borobudur complex (*Kompleks Taman Wisata Candi Borobudur*) that can serve as a precedent for assessing contextuality, the challenge lies in the Balaputeradewa corridor and other corridors outside the temple complex, which are privately owned. Unfortunately, private property presents a higher gap between maintaining a sense of place and economic issues. Preserving cultural sustainability around heritage sites is crucial for maintaining the sense of place in the area. To achieve this, guidelines for roof styles and motifs are often recommended. By leveraging data from relief in places like the Borobudur temple, creating a precedent for improvement becomes possible. By adapting these styles to fit both new and old building guidelines within their context, cultural sustainability can be effectively maintained within heritage sites. The impact of such preservation efforts can be significant and long-lasting.

4. Conclusion

The Borobudur temple boasts ten unique roof styles that are categorized into pyramid, curved pyramid, and gables sloping out styles. These styles are further enhanced by three roof motifs, including plain, vertical block, wreath, and tassel motifs. Unfortunately, two of the roof styles remain unidentified due to the recent building cladding that obscures the original roof structure. The lack of information on these two roof styles and two roof motifs presents a challenge for maintaining the heritage and cultural sustainability of the Borobudur area. New regulations will need to be implemented to ensure that the sense of place is preserved.

The research findings suggest that the roof style and motifs can serve as physical form indicators for maintaining a sense of place and cultural sustainability in heritage areas. By using the Borobudur temple as a contextuality indicator, we can develop strategies to maintain cultural sustainability beyond the building's form, style, material, and color.

Author Contributions: All authors contributed to this research.

Funding: This research received no external funding. Some of the research was from thesis research in Master of Architecture program at Master of Architecture study program at Department of Architecture Universitas Islam Indonesia.

Conflicts of Interest: The authors declare no conflict of interest.

Informed Consent Statement/Ethics approval: Not applicable

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