

Typology and Transformation of Traditional Spatial Planning in Balinese Indigenous Villages: The Case of Blahbatuh

I Gusti Ngurah Anom Gunawan, Suzanna Ratih Sari, Bangun IR. Hasritanto, Sukawi

Departemen Arsitektur, Fakultas Teknik, Universitas Diponegoro, Semarang, INDONESIA

E-mail: batam.garisdimensi@gmail.com

| Submitted: March 06, 2025 | Revised: September 30, 2025 | Accepted: December 19, 2025 |

| Published: December 31, 2025 |

ABSTRACT

The spatial planning of traditional Balinese villages embodies a profound cultural and religious philosophy, ensuring a balance between sacred spaces, residential areas, and public domains. This study investigates the implementation of the Ulu Teben concept within the spatial structure of traditional villages in Blahbatuh, Bali, and its adaptation to modernization and economic shifts. The primary objective is to assess the extent to which Ulu Teben principles have been maintained and to identify key factors driving spatial transformations. A qualitative approach with a case study method is employed, integrating field observations, in-depth interviews with customary leaders and local communities, and document analysis. The research utilizes thematic and spatial analysis, supported by Geographic Information System (GIS)-based mapping to track spatial alterations. Findings indicate that while Ulu Teben remains a foundational principle in traditional village spatial planning, various adaptations have emerged due to population growth, economic pressures, and the expansion of the tourism sector. These changes have led to shifts in land use, including the conversion of sacred zones into residential and commercial areas. The degree of adaptation varies across different traditional villages, demonstrating flexibility in the application of traditional spatial structures. This study concludes that safeguarding traditional spatial planning necessitates a balanced strategy that integrates indigenous wisdom with modern urban planning policies. Strengthening customary regulations, leveraging digital mapping technologies, and promoting active community involvement are crucial measures in preserving the integrity of the Ulu Teben concept amid modernization challenges.

Keywords: Ulu Teben, Balinese Traditional Village, spatial planning, cultural sustainability, land-use transformation.

INTRODUCTION

The spatial planning of traditional villages in Bali represents a legacy of traditional spatial planning systems that have been passed down through generations and remain an integral part of community life. Balinese customary villages (*desa adat*) serve not only as residential areas but also as religious and social spaces rooted in Balinese Hindu philosophy. One of the fundamental principles in the spatial organization of customary villages is the Ulu Teben concept, which regulates spatial orientation and hierarchy based on sacred values and cosmological relationships with nature. This concept forms the basis for creating a harmonious village spatial pattern, where each spatial element has a role and meaning that supports the balance between humans, the environment, and spirituality [1], [5]-[7]. A study on the spatial planning of customary villages, particularly in Desa Adat Blahbatuh, is essential in understanding how this traditional concept continues to be applied amid modernization and ongoing social transformations

In recent decades, rapid economic development, tourism expansion, and urbanization have posed significant challenges to the sustainability of customary village spatial planning in Bali. Land-use changes that do not align with traditional spatial principles have disrupted local social and cultural systems. Highlights that the increasing number of commercial developments around customary villages has led to shifts in spatial functions, ultimately threatening the cultural and environmental sustainability that has been preserved for centuries. *Desa Adat* Blahbatuh serves as a case study of a customary village experiencing pressure from urbanization and spatial transformation,

necessitating an in-depth examination of the extent to which the Ulu Teben concept can be maintained and applied in contemporary times.

One of the main challenges in the spatial planning of customary villages in Bali is the imbalance between preserving cultural values and meeting the demands of modern development. Many customary villages face dilemmas in maintaining their traditional spatial structures while accommodating modern facilities and more efficient infrastructure. This phenomenon is not unique to Desa Adat Blahbatuh but is also prevalent in various other customary villages in Bali facing similar challenges. Therefore, this study aims to explore how spatial typologies in Desa Adat Blahbatuh can be categorized based on the Ulu Teben principle and identify the factors driving changes in the village's spatial patterns.

To address these challenges, several solutions have been proposed by previous researchers. A commonly implemented approach is strengthening spatial regulations through customary laws and local government policies. Emphasizes the importance of binding regulations in maintaining the spatial structure of customary villages in accordance with inherited cultural values [2], [8]-[10]. Additionally, the integration of digital mapping technologies such as Geographic Information Systems (GIS) has been introduced to monitor spatial changes and provide data-driven recommendations for customary village planning [3], [11]-[13]. However, the effectiveness of these solutions still requires further evaluation, particularly in the context of unique customary villages like Blahbatuh.

Several previous studies have also highlighted the significance of community-based approaches in maintaining the spatial structure of customary villages. Community participation in decision-making regarding spatial changes is a key factor in ensuring the continuity of traditional spatial principles [4], [14]-[16]. Therefore, this study will consider a participatory approach to analyze how the indigenous community in Blahbatuh can actively contribute to designing sustainable spatial planning policies.

Although various aspects of customary village spatial planning have been widely discussed in the academic literature, there is still a gap in understanding how the Ulu Teben concept specifically functions in structuring the spatial organization of Balinese customary villages. Many studies have primarily focused on the Tri Mandala and Sanga Mandala concepts, while research specifically on Ulu Teben remains limited. Furthermore, there is a lack of empirical studies evaluating the effectiveness of regulations and adaptation strategies for customary villages facing external pressures such as tourism and urbanization. Therefore, this study aims to bridge this gap by providing a more comprehensive analysis of spatial typologies based on Ulu Teben and examining how this concept can be preserved in the modern era.

RESEARCH METHODS

This study employs a qualitative case study approach to analyze the spatial typology of Blahbatuh Traditional Village based on the Ulu Teben concept. A case study was selected to enable an in-depth exploration of phenomena in their original context, considering social, cultural, and environmental aspects. This approach provides a broader understanding of traditional village spatial dynamics amid modernization and economic shifts.

Research Approach The qualitative approach in this research focuses on an in-depth exploration of spatial patterns, traditional values, and factors influencing changes in traditional village spatial planning. This study prioritizes the perspectives of indigenous communities to understand spatial transformations based on tradition. A qualitative study is employed to identify persistent spatial patterns and aspects that have changed due to external pressures.

The case study method was chosen to examine real-world phenomena within complex environments. Highlights that case studies offer deep insights that are difficult to obtain through quantitative methods. In this study, case studies focus on various locations within Blahbatuh Traditional Village, exhibiting different levels of Ulu Teben implementation. The accuracy in determining the strategy in the flow chart will provide direction for the type of research that supports it. Figure 1.

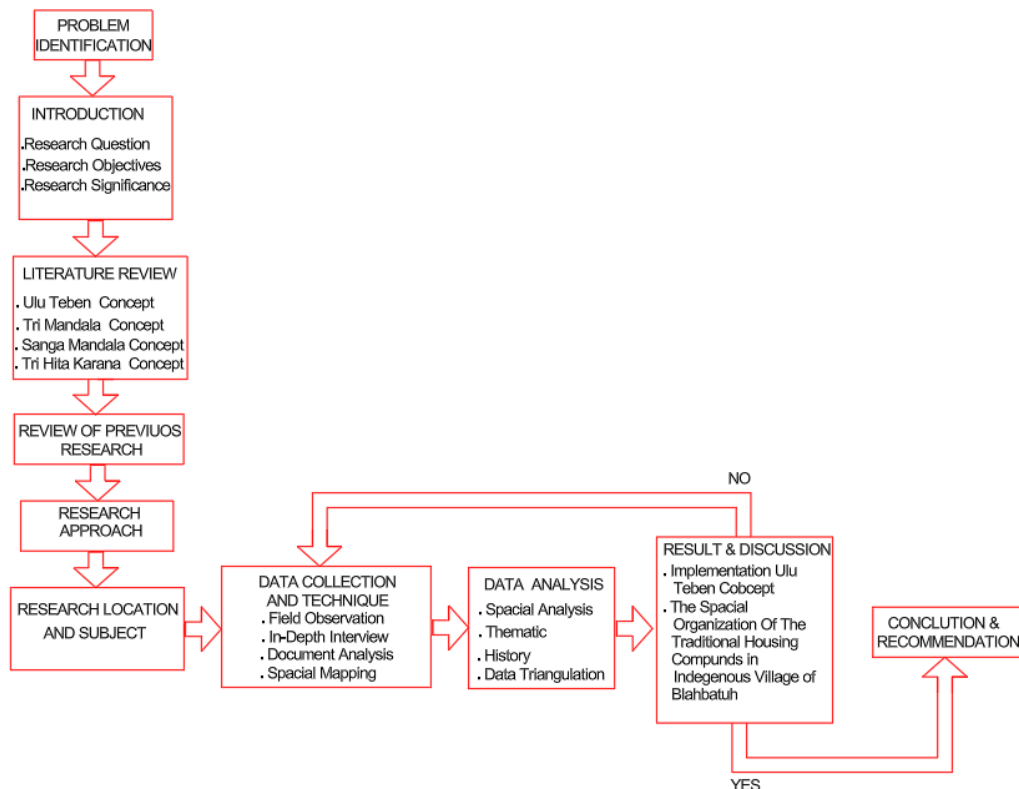


Figure 1. Flow chart

Data Analysis

Data analysis in this study involves a rigorous and multidimensional approach to ensure accuracy and reliability. The following techniques were employed:

Spatial Analysis: Geographic Information Systems (GIS) were used to map and analyze spatial transformations within the village. This technique enables the identification of land-use changes, zoning shifts, and deviations from traditional spatial planning principles. The spatial data collected were processed using ArcGIS software to compare past and present village layouts, highlighting areas of significant transformation.

Thematic Analysis: Data obtained from interviews and observations were coded and categorized into key themes, including the preservation of the Ulu Teben concept, land-use transformations, and socio-economic influences on spatial organization. The thematic analysis allowed for the identification of patterns and underlying factors contributing to spatial changes.

Data Triangulation: To ensure the validity and reliability of findings, multiple data sources including field observations, interviews, and document analysis were cross-verified. This triangulation method enhances the credibility of the research by reducing biases and confirming consistency across different data sets.

Historical Analysis: A historical examination of spatial changes over time was conducted to understand long-term trends in traditional village planning. Archival records, historical maps, and previous research were analyzed to contextualize spatial transformations within broader socio-cultural and economic shifts.

RESULT AND DISCUSSION

The Ulu Teben concept is a fundamental principle in the spatial planning of traditional villages in Bali, determining spatial orientation and division based on sacredness and cosmological hierarchy. This concept remains evident in the physical structure of Blahbatuh Traditional Village, where

sacred areas such as the main temples are positioned in the *ulu* (upstream/highland) section, whereas profane areas, including residential zones and markets, are situated in the *teben* (downstream/lowland) section [1].

Field observations reveal that Blahbatuh Traditional Village continues to uphold the Ulu Teben-based structure in the arrangement of the Pura Kahyangan Tiga temples. The Pura Puseh, which symbolizes divinity, is positioned in the village's upstream region, adjacent to areas with higher elevation. Conversely, the Pura Dalem is located in the *teben* region, close to the traditional cemetery (*setra adat*). This spatial division aligns with the Hindu-Balinese cosmological principle, which categorizes spaces according to spiritual and sacredness levels.

However, this study also identifies deviations from the traditional pattern due to modernization pressures. Population growth and land-use changes have resulted in spatial transformations that no longer strictly adhere to the Ulu Teben concept. Some residential areas now encroach upon sacred zones, potentially impacting the spiritual and social values of the traditional community.

Blahbatuh Village comprises five traditional villages: Blahbatuh Traditional Village, Satria Traditional Village, Teruna Traditional Village, Antugan Traditional Village, and Darmatiaga Traditional Village. Each of these villages applies the Ulu Teben concept differently, particularly in the placement of Pura Kahyangan Tiga, traditional cemeteries (*setra adat*), and traditional community halls (*Balai Banjar Adat*). The implementation of the Ulu Teben spatial concept in Blahbatuh Village is illustrated in Figure 2.

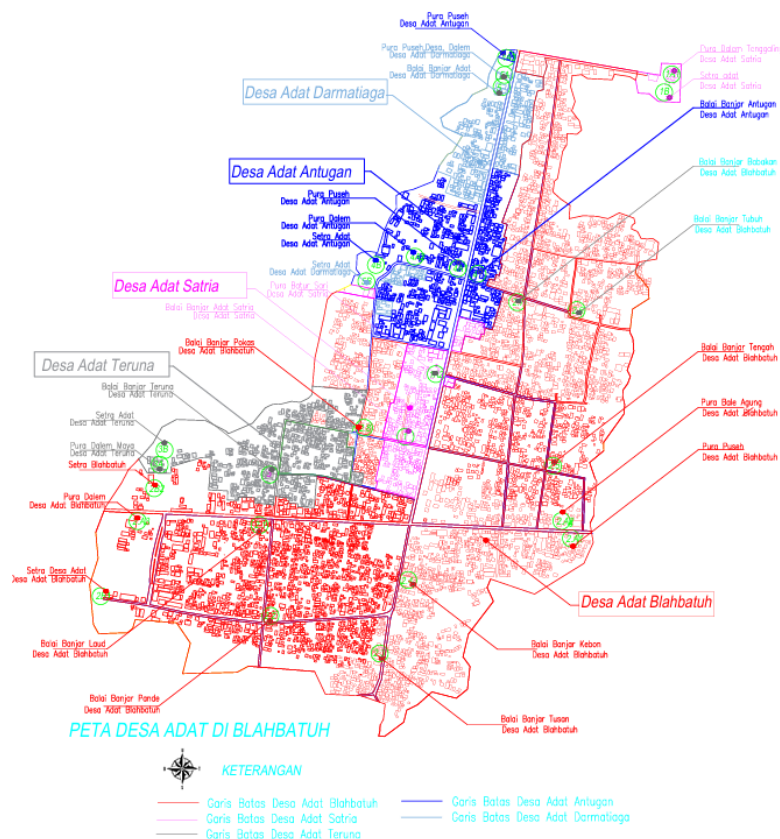


Figure 2. Traditional Villages in Blahbatuh Village

Blahbatuh Traditional Village exemplifies the Ulu Teben application by maintaining its traditional spatial structure. The Pura Kahyangan Tiga temples remain the sacred center in the *ulu* region, while the market and residential areas are located in the *teben* region. However, urban expansion and infrastructure development have led to spatial modifications, where some areas previously designated as *Madya Mandala* have been repurposed into residential and commercial facilities.

Specifically, main roadside areas have been transformed into commercial spaces such as shops and stalls. The spatial pattern of Blahbatuh Traditional Village is depicted in Figure 3.

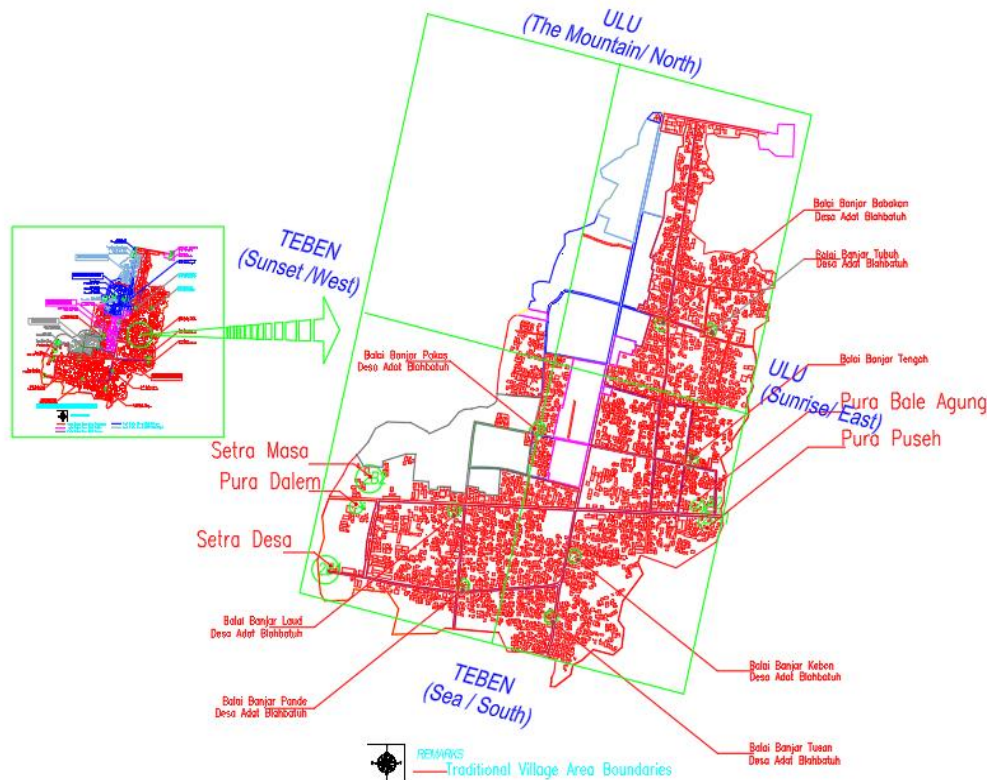


Figure 3. Ulu Teben Spatial Pattern of Blahbatuh Traditional Village

Based on the spatial layout, Pura Puseh and Pura Bale Agung are situated in the eastern (ulu) area, while Pura Dalem is positioned in the western (teben) region. The village has two cemeteries: Setra Masa and Setra Desa, both located in the teben section. Approximately 60% of the traditional community's residential compounds are in the ulu section, while 40% are in the teben section. The village market, serving as the economic center, is also located in the western teben area, near Pura Dalem.

The spatial arrangement of Satria Traditional Village is illustrated in Figure 4. The Ulu Teben spatial concept in Satria Traditional Village differs from the common pattern. The Pura Kahyangan Tiga temples in this village are located in two different areas. Pura Dalem Tanggaling is positioned in the ulu region, while Pura Batur Sari, which houses Pura Bale Agung, is also in the ulu region. The Setra Adat Satria cemetery is located near Pura Dalem Tanggaling in the ulu area. According to the village elders, these placements are rooted in historical factors from the Blahbatuh Kingdom era, where Pura Dalem Tanggaling existed before Satria Traditional Village was formally established. When the village was founded, the community agreed to designate Pura Dalem Tanggaling as the primary Pura Dalem, with the adjacent cemetery as the traditional burial ground.

In Satria Traditional Village, 45% of residential compounds are in the ulu area, while 55% are in the teben area. Similar to Blahbatuh, roadside properties have been repurposed into commercial establishments due to urbanization and economic growth.

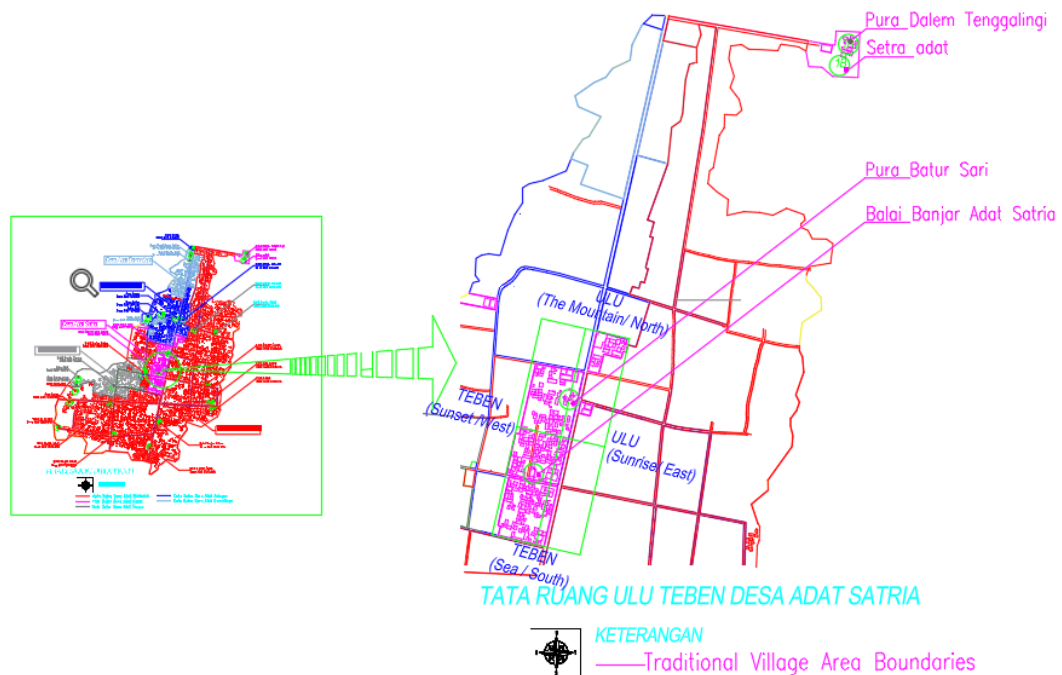


Figure 4. Ulu Teben Spatial Pattern of Satria Traditional Village

Teruna Traditional Village exhibits a unique spatial pattern compared to other villages in Blahbatuh. The Pura Kahyangan Tiga Pura Puseh, Pura Bale Agung, and Pura Dalem are all located within Pura Dalem Maya, situated in the western teben area. The Setra Adat Teruna cemetery is also in the teben section, close to Pura Dalem Maya. According to the village elders, Pura Dalem Maya predates the formation of Teruna Traditional Village and was historically managed by the Teruna Banjar community before transitioning into a formal traditional village. When the village was officially established, the community agreed to consolidate the Pura Kahyangan Tiga temples within Pura Dalem Maya, along with the adjacent cemetery. The spatial layout of Teruna Traditional Village is shown in Figure 5.

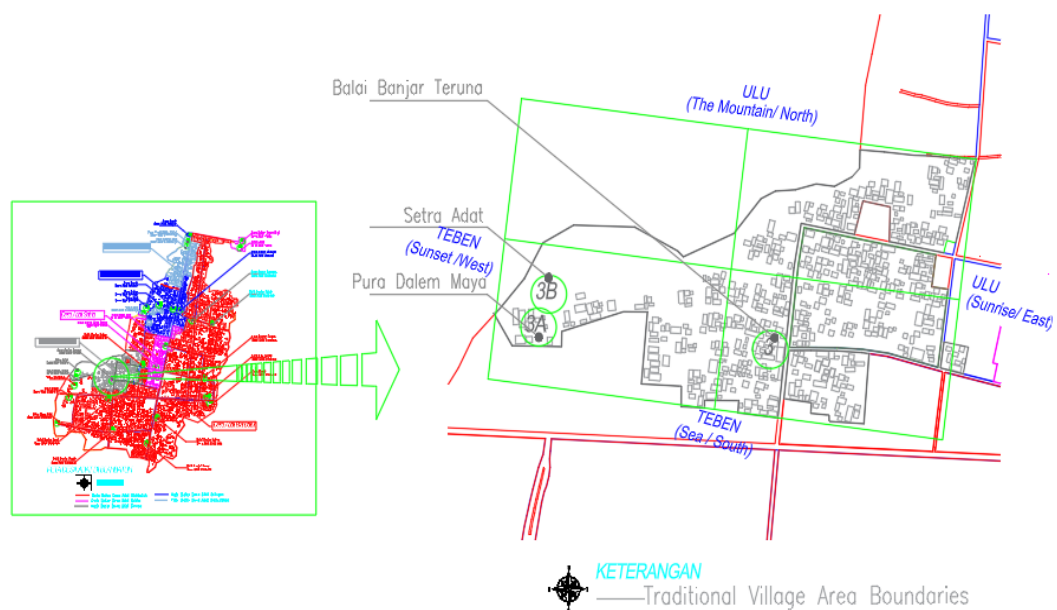


Figure 5. Ulu Teben Spatial Pattern of Teruna Traditional Village

Based on the Ulu Teben spatial layout of Teruna Traditional Village, 80% of the residential compounds are in the ulu section, while 20% are in the teben area. Changes in land use have also been observed, particularly in roadside properties that have been converted into shops and stalls, serving the communities of Satria, Blahbatuh, and Teruna Traditional Villages.

Antugan Traditional Village adheres to the conventional Ulu Teben spatial concept, where Pura Puseh and Pura Bale Agung are positioned in the ulu (northern) area, while Pura Dalem is located in the teben (southern) area. However, spatial modifications have occurred along the main road, with many properties repurposed into shops and commercial establishments, including traditional meeting halls (*Balai Banjar Adat*).

Approximately 60% of residential compounds are in the ulu area, while 40% are in the teben section, as depicted in Figure 6.

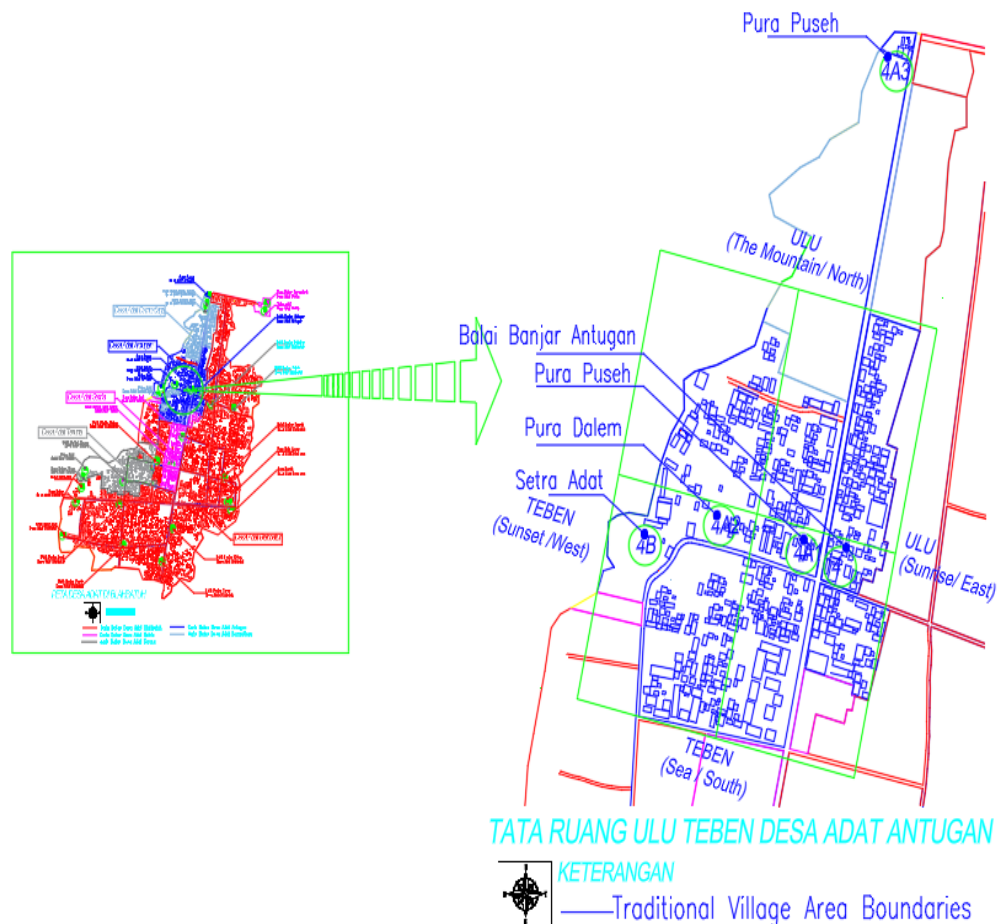


Figure 6. Ulu Teben Spatial Pattern of Antugan Traditional Village

Darmatiaga Traditional Village exhibits a slightly different Ulu Teben spatial pattern. Unlike other villages, all three Pura Kahyangan Tiga temples Pura Puseh, Pura Desa/Pura Bale Agung, and Pura Dalem are consolidated in a single location north of the Balai Banjar Adat Darmatiaga. The Setra Adat cemetery is in the teben section, farther from Pura Dalem than is typical, due to land constraints.

Residential compounds are evenly distributed, with 50% in the ulu section and 50% in the teben section. As with other villages, roadside properties have been converted into commercial establishments due to economic growth and urbanization. The Ulu Teben spatial pattern of Darmatiaga Traditional Village is shown in Figure 7.



Figure 7. Ulu Teben Spatial Pattern of Darmatiaga Traditional Village

The housing compounds of indigenous communities in Blahbatuh continue to adhere to traditional spatial patterns, following the Sanga Mandala concept. Houses are typically oriented towards Mount Agung and the rising sun as the sacred center, while kitchens and storage areas are placed in lower zones. This spatial arrangement aims to maintain the spiritual balance and functional efficiency of living spaces in the daily lives of the indigenous people.

Based on field observations and interviews with homeowners, the implementation of Sanga Mandala in traditional housing compounds in Blahbatuh can be categorized into several types, as illustrated in Figures 8 and 9.

In the Sanga Mandala spatial arrangement of Type 1 (Figure 8), the kitchen (pawon) is positioned in Nistaning Nista, while the family shrine (Merajan/Sanggah) is located in Utaming Utama. The Bale Daja is situated on the northern side (Utamaning Madya), Bale Dangin on the eastern side (Madyaning Utama), and Bale Delod on the southern side (Nistaning Madya). Additional Bale Dauh and Bale Dangin structures have been introduced as sleeping areas for the growing family. The kitchen, located near the entrance (angkul-angkul), symbolizes the manifestation of Dewa Brahma (fire) as a purifier of negative energy. Consequently, entering the compound traditionally begins with passing through the kitchen for energy purification.

In Type 2 (Figure 9), the Merajan/Sanggah remains in Utaming Utama, while Bale Daja is positioned in Utamaning Madya (north), Bale Dangin in Madyaning Utama (east), and Bale Delod is integrated with the kitchen in Nistaning Madya (south). Unlike Type 1, the kitchen in this layout is not placed near the entrance to prevent it from being visible to visitors due to concerns about tidiness.

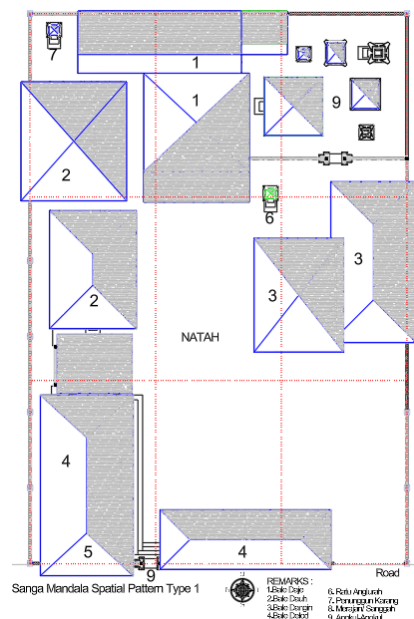


Figure 8. Sanga Mandala Spacial Pattern
Traditional Housing Type 1

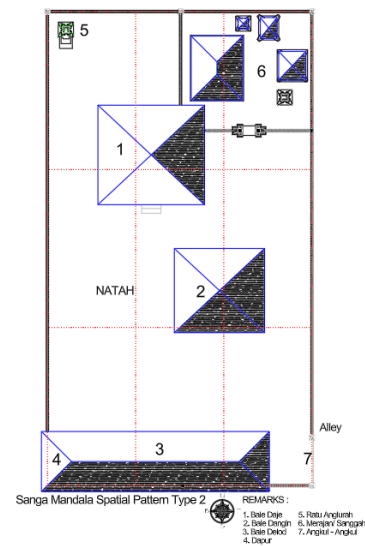


Figure 9. Sanga Mandala Spacial Pattern
Traditional Housing Type 2

In Type 3 (Figures 10 and 11), the Merajan/Sangghah is located in Utamaning Madya/Kaje Kangin (northeast), Bale Daja in Utamaning Madya (north), Bale Dangin in Madyaning Madya and Madyaning Utama (east), Bale Dauh in Madyaning Nista (west), and Bale Delod in Madyaning Madya (south). The kitchen is placed away from the entrance for privacy reasons. Additional structures have been built to accommodate the increasing number of family members.

Type 4 demonstrates a similar spatial arrangement, with the Merajan/Sangghah in the northeast (Utamaning Utama), Bale Daja in the north (Utamaning Madya), Bale Dauh in the west (Madyaning Nista), Bale Dangin in the east (Madyaning Utama), and Bale Delod in the south (Nistaning Nista). The kitchen is situated in the southeast (Nistaning Nista), strategically hidden from visitors' view.

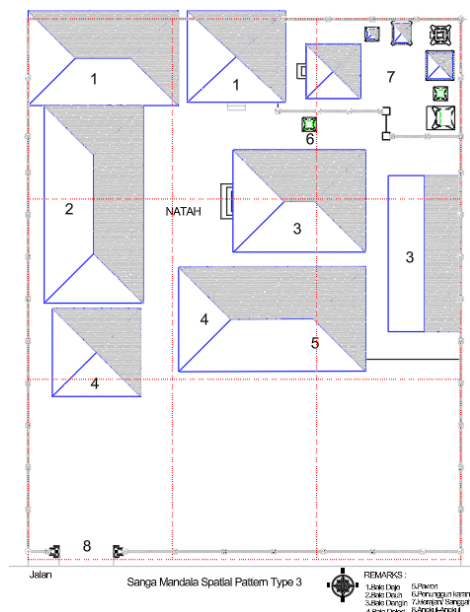


Figure 10. Sanga Mandala Spacial Pattern
Traditional Housing Type 3

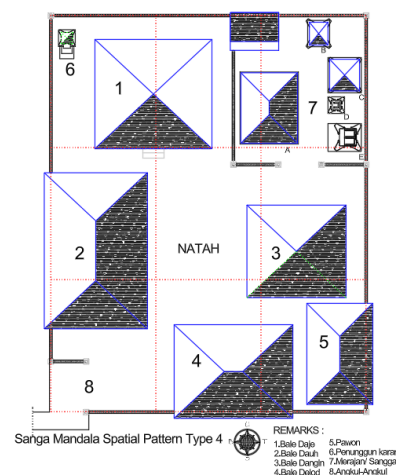


Figure 11. Sanga Mandala Spacial Pattern
Traditional Housing Type 4

In Type 5 (Figures 12 and 13), the Merajan/Sangghah remains in Utamaning Utama (northeast), Bale Daja in Utamaning Madya (north), Bale Dauh in Madyaning Nista (west), Bale Dangin in Madyaning Madya (east), and Bale Delod in Nistaning Madya (south). However, the kitchen is placed in Madyaning Utama (east), deviating from the conventional Sanga Mandala arrangement, where the kitchen is typically located in Nista. According to the homeowner, this adjustment was made to keep the kitchen out of sight from guests. Additionally, a small shop (warung) has been introduced in Utamaning Nista (north) to generate extra income by utilizing land near the main road.

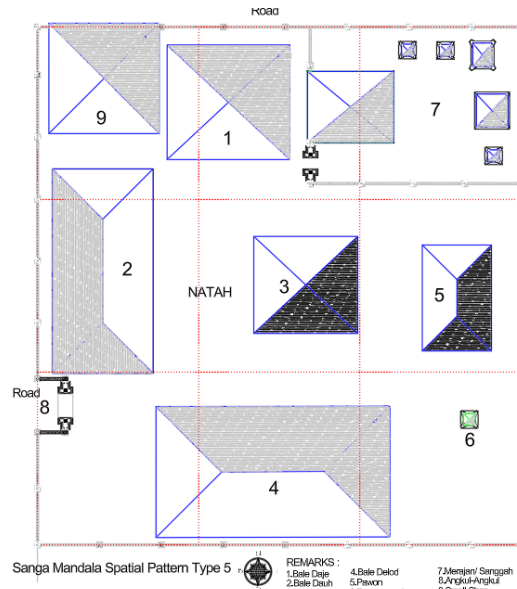


Figure 12. Sanga Mandala Spacial Pattern Traditional Housing Type 5

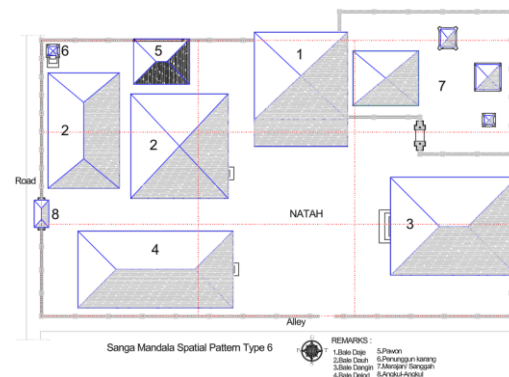


Figure 13. Sanga Mandala Spacial Pattern Traditional Housing Type 6

CONCLUSION

This study has examined the application and transformation of the Ulu Teben spatial concept in the traditional villages of Blahbatuh, Bali. Through qualitative analysis utilizing field observations, in-depth interviews, and spatial mapping techniques, the research demonstrates that while Ulu Teben remains a fundamental organizing principle, significant adaptations have occurred due to modernization, population growth, and economic pressures. Findings indicate that the spatial organization of Blahbatuh's traditional villages including Blahbatuh, Satria, Teruna, Antugan, and Darmatiaga continues to reflect the Ulu Teben principle, where sacred spaces (pura) are positioned in higher elevations (ulu), while residential and commercial areas are allocated in lower sections (teben). However, deviations have emerged, particularly in response to land demand and shifts in land use. Sacred spaces have, in some cases, been encroached upon by residential and commercial developments, raising concerns over the erosion of cultural values. Key factors driving spatial transformation include economic expansion, government policies on land use, and external investment. While some villages retain their spatial integrity, others have experienced substantial alterations, leading to hybrid spatial arrangements where traditional and modern elements coexist. This study's novelty lies in its in-depth exploration of Ulu Teben, filling a gap in Balinese spatial planning literature. Unlike previous research that focused on Tri Mandala and Sanga Mandala, this study highlights Ulu Teben's role and its adaptation amid socio-economic pressures. To safeguard traditional spatial planning while accommodating modern development, a multi-pronged approach is recommended. Strengthening customary regulations, leveraging digital mapping technologies, and fostering community participation in land-use planning are essential. Policy interventions should prioritize cultural sustainability by ensuring spatial transformations align with indigenous values. Future research should explore innovative frameworks that balance heritage preservation with economic imperatives, securing the integrity of Balinese traditional spatial organization in evolving urban landscapes.

ACKNOWLEDGEMENT

The authors would like to express their sincere gratitude to all individuals and institutions who contributed to the completion of this research. Special thanks are extended to the customary leaders and community members of Blahbatuh for their invaluable insights and participation in this study. The support and cooperation provided by local government authorities and academic experts have been instrumental in enriching our analysis. We are also grateful to our research colleagues and institutional affiliates for their constructive feedback and scholarly discussions that enhanced the depth of this study. Additionally, we acknowledge. Finally, we extend our appreciation to the reviewers and editors for their insightful comments and suggestions, which significantly improved the quality of this manuscript. Any remaining errors or interpretations are solely the responsibility of the authors.

REFERENCES

- [1] Windia, W., & Dewi, N. L. P. (2013). *Tri Hita Karana dan Implementasinya dalam Pembangunan Berkelanjutan di Bali*. Denpasar: Pustaka Larasan.
- [2] Budiharjo, E. (1997). *Arsitektur: Bentuk, Ruang, dan Tatanan*. Jakarta: PT Gramedia Pustaka Utama.
- [3] Tjahjono, G. (2000). *Cosmology and Architecture in Premodern Indonesia: Architecture, Ritual, and Society*. Oxford: Oxford University Press.
- [4] Dwijendra, N. K. A. (2021). Urbanization and the transformation of traditional Balinese houses. *Vernacular Architecture Review*, 10(2), 89–105.
- [5] Adhika, I. N. (2022). Spatial arrangement and cultural resilience in Balinese traditional villages. *Journal of Urban and Regional Planning*, 45(2), 189–203.
- [6] Ardika, I. W. (2020). *Arkeologi Bali: Dari Masa Prasejarah hingga Kerajaan Hindu-Buddha*. Denpasar: Udayana University Press.
- [7] Ardika, I. W. (2020). Preservation of spatial concepts in Balinese traditional architecture. *Asian Journal of Environmental Design*, 14(3), 321–337.
- [8] Anom, I. P. (2018). Transformation of sacred spaces in Balinese traditional settlements: Challenges and adaptations. *International Journal of Heritage Studies*, 24(5), 654–670.
- [9] Dwipayana, I. G. (2019). Adaptation of Balinese architecture to tourism development: A case study of Ubud. *Journal of Tourism and Cultural Change*, 17(1), 112–128.
- [10] Kuta, I. G. P., Wijaya, K., & Rahayu, S. (2022). Spatial dynamics of Balinese traditional villages: Adaptation and transformation. *International Journal of Built Environment*, 29(3), 203–217.
- [11] Krier, R. (2009). *Architectural Composition*. New York: Rizzoli.
- [12] Nas, P. J. M. (2003). *Urban Symbolism*. Leiden: Brill.
- [13] Norberg-Schulz, C. (1980). *Genius Loci: Towards a Phenomenology of Architecture*. New York: Rizzoli.
- [14] Oliver, P. (2006). *Built to Meet Needs: Cultural Issues in Vernacular Architecture*. London: Routledge.
- [15] Soegijanto, F. X. (2018). *Perkembangan Kota dan Permasalahannya*. Yogyakarta: Gadjah Mada University Press.
- [16] Sutopo, H. B. (2006). *Metodologi Penelitian Kualitatif: Teori dan Aplikasi dalam Penelitian Sosial*. Surakarta: UNS Press.