Typological Analysis of Commercialization-Induced Spatial Transformations in Traditional Balinese Houses

I Dewa Gede Putra[1], Purwanita Setijanti[1*] and Asri Dinapradipta[1]

[1]Department of Architecture, Institut Teknologi Sepuluh Nopember, Surabaya, Indonesia.

*Corresponding author: p.setijanti@its.ac.id

Abstract

As Bali's tourism economy intensifies, Traditional Balinese Houses (TBHs) are increasingly transformed for commercial functions. While their symbolic and cultural roles have been widely studied, fewer investigations focus on how commercialization alters their spatial organization and disrupts Balinese spatial principles such as *Tri Hita Karana, Tri Mandala, Sanga Mandala,* and the *Kaja–Kelod* axis. This study examines five TBHs in Ubud using a triangulated methodology combining micro-scale spatial mapping, in-depth interviews with residents and stakeholders, and regulatory analysis. Findings identify three dominant transformation patterns: spatial conversion, spatial reconfiguration, and vertical extension. Hospitality-driven commercialization often triggers vertical growth, while retail and food-related uses drive the repurposing of communal and profane zones. Although sacred zones like the *merajan* remain intact, these adaptations increasingly blur traditional zoning hierarchies. The study reveals a governance gap: while Bali Provincial Regulation No. 5 of 2005 promotes traditional identity, it offers limited guidance for hybrid or tourism-modified dwellings. Informal customary systems, such as Asta Kosala-Kosali, often serve as substitutes but lack institutional support. This research contributes to vernacular resilience discourse by highlighting how TBH transformations are shaped by overlapping systems of tradition, economy, and regulation, calling for more responsive planning tools that support culturally rooted adaptation.

1.0 INTRODUCTION

The transformation of vernacular architecture in response to modern pressures has been widely examined within architectural and urban studies (Lozar & Rapoport, 1970; Oliver, 2007; Philokyprou, 2015). Buildings are not static entities; they evolve under socio-economic shifts, technological advancements, and environmental changes (Hyde, 2018; Nabilunnuha & Novianto, 2022). Spatial adaptation in architecture represents a continuous negotiation, between preservation and transformation, continuity and rupture, tradition and modernity. As urbanization and globalization intensify, vernacular dwellings are increasingly required to balance their cultural integrity with the evolving functional demands of contemporary life. The Traditional Balinese House (TBH) exemplifies this dilemma, particularly in the cultural landscape of Ubud, where tourism has reconfigured land values, everyday practices, and architectural forms. (Sari & Kusuma, 2020; Sarjana et al., 2020; Wijaya & Wiranegara, 2020).

This study focuses on TBHs in Ubud, Bali, specifically along Karna Street, adjacent to the Ubud Market. While many previous studies have examined TBH transformation from the perspective of cultural meaning and socio-religious change (Aritama & Putra, 2021), this research distinguishes itself by focusing instead on typological classification: identifying how different commercialization typologies correlate with specific patterns of spatial transformation. This approach emphasizes physical restructuring rather than symbolic reinterpretation, aiming to provide a clearer understanding of the architectural logic behind commercialization-driven change in heritage contexts. Rather than treating commercialization as a cultural abstraction, this paper examines how it materializes through architectural decisions: what functions get added, where they appear within the compound, and how these changes align with or deviate from spatial principles such as *Tri Hita Karana, Tri Mandala, Sanga Mandala,* and the *Kaja–Kelod* axis. This focus on spatial typologies fills a significant gap in current TBH literature, which often lacks grounded classification of change at the intersection of formal regulation and lived adaptation.

As commercialization accelerates, the transformation of TBHs is not only a result of resident decision-making or economic necessity, but also deeply entangled with overlapping systems of governance (Li et al., 2023). However, unlike many formalized urban settings, TBHs exist within a gray zone where institutional oversight is fragmented and often mediated by oral tradition and community negotiation. Understanding this regulatory ambiguity is essential to grasping the uneven, and at times contradictory, patterns of transformation observed in the field (Pranajaya et al., 2020). Although customary village (*desa adat*) governance continues to influence land use and architectural practices in many Balinese contexts, in this case, economic-commercial pressures emerge as the dominant catalyst of change. Even so, spatial transformation is not solely shaped by market dynamics. It is mediated through a complex regulatory environment that includes both formal planning policies and customary law (Paturusi & Widiastuti, 2023; Wardana, 2015). While no specific regional regulation governs TBHs, Bali Provincial Regulation No. 5 of 2005 (Pemerintah Provinsi Bali, 2005), promotes Balinese architectural aesthetics at a general level, offering limited protection for traditional spatial logic. In parallel, *Asta Kosala-Kosali*, a set of customary guidelines rooted in Balinese cosmology and recorded in *lontar* manuscripts, remains a vital yet orally transmitted reference for spatial design (Siswadi & Dwiputri Maharani, 2023). Residents often consult customary leaders (*pemuka adat*) to interpret and implement these principles, underscoring the coexistence—and sometimes tension—between cultural continuity and informal reinterpretation. Taken together, these formal and informal systems demonstrate that the transformation of TBHs is shaped not only by tourism and economic imperatives, but also by overlapping forms of cultural authority, regulatory ambiguity, and community-based knowledge (Wicaksana, 2018). This study explores these issues through two central research questions:

i.   What types of spatial transformations occur in TBHs in response to commercialization, and to what extent do these changes align with or deviate from traditional Balinese spatial principles such as *Tri Mandala, Sanga Mandala,* and the *Kaja–Kelod* axis?

ii.   How do commercialization typologies influence these spatial changes, and what are the long-term implications for planning and cultural preservation?

By classifying spatial transformation patterns across five case studies and linking them to distinct commercialization modes, this paper contributes a practical framework for understanding heritage adaptation in Bali's rapidly transforming urban fabric. The study finds that different commercialization typologies lead to distinct spatial transformations in TBHs: hospitality often results in vertical extensions, retail drives spatial conversion and additions at the ground level, and food & beverage businesses typically modify open communal areas into semi-public spaces. These patterns show how each economic function reshapes traditional layouts in specific ways. Rather than offering general cultural commentary, the findings provide typological insights that may inform local planning guidelines and future regulatory mechanisms for built heritage management in tourism-driven contexts.

2.0 LITERATURE REVIEW

2.1 Understanding Spatial Transformation in Vernacular Architecture: Theories and Global Perspectives

Vernacular architecture is inherently adaptable, continuously reshaped by cultural, economic, and environmental forces. Unlike standardized modern buildings, vernacular structures evolve through localized knowledge and incremental modifications, reflecting the lived experiences of their inhabitants (Lozar & Rapoport, 1970; Oliver, 2007). Spatial transformation in these contexts is a negotiation—between preservation and change, tradition and modernity—often triggered by external pressures such as urbanization, tourism, and commercialization (Nabilunnuha & Novianto, 2022). This study draws selectively on Amos Rapoport's insights into vernacular environments, particularly his emphasis on how spatial organization reflects environmental adaptation and functional needs (Altman et al., 1980; Lozar & Rapoport, 1970). Rather than interpreting transformation as a cultural process, this research engages Rapoport's spatial framework to understand how TBHs respond to external pressures such as commercialization.

Across global contexts, vernacular dwellings have adapted through both formal interventions (e.g., government-led upgrades) and informal modifications by residents. These spatial changes reflect ongoing tensions between economic utility and cultural continuity. Studies on West African and Liberian traditional architecture demonstrate how modern construction techniques have altered indigenous spatial arrangements, impacting cultural heritage and sustainability (Gbatu & Li, 2019). Similar challenges arise in the Baiga tribe of India, where aspirations for modernization have led to significant changes in spatial organization and material usage (Patidar et al., 2020). Meanwhile, studies on Zambian Lamba architecture highlight how economic and technological shifts influence material selection and construction techniques (Dioma et al., 2018).

In Southeast Asia, transformations have taken the form of vertical extensions and mixed-use adaptations. Traditional Malay houses in Kampong Baru, Kuala Lumpur have responded to urban densification pressures by transforming into vertical and multifunctional dwellings (Ahmad et al., 2022; Ju et al., 2009). Similarly, the recalibration of Thai vernacular architecture demonstrates how traditional design principles are reimagined to align with modern needs while retaining cultural authenticity (Punpairoj, 2018). Rural housing in North China, the traditional quadrangles, has also undergone significant changes in layout and purpose over time, driven by agricultural shifts and economic migration, reflecting how households evolve to meet new livelihood demands (Yangang & Jisheng, 2014).

These international examples reveal recurring transformation logics—such as spatial conversion, vertical expansion, and internal reorganization—that are not simply physical adjustments, but also cultural compromises. However, the extent to which these transformations are regulated, negotiated, or resisted varies across settings. Within Bali, research on Pinggan Village in Kintamani suggests that traditional Balinese architecture undergoes incremental transformations to meet contemporary needs while maintaining cultural relevance (Muktiwibowo & Wina Satria, 2020). Yet, this case differs significantly from commercialized zones like Ubud, where the pressures of tourism generate more drastic and profit-driven spatial modifications.

Table 1 outlines key global cases and their transformation patterns. These examples are not presented as direct parallels but as comparative precedents that highlight how vernacular dwellings under commercial or urban pressure tend to undergo similar spatial strategies while navigating different cultural, regulatory, and material constraints.

Table 1. Global Transformation in Vernacular Architecture: Drivers and Spatial Changes Across Contexts.

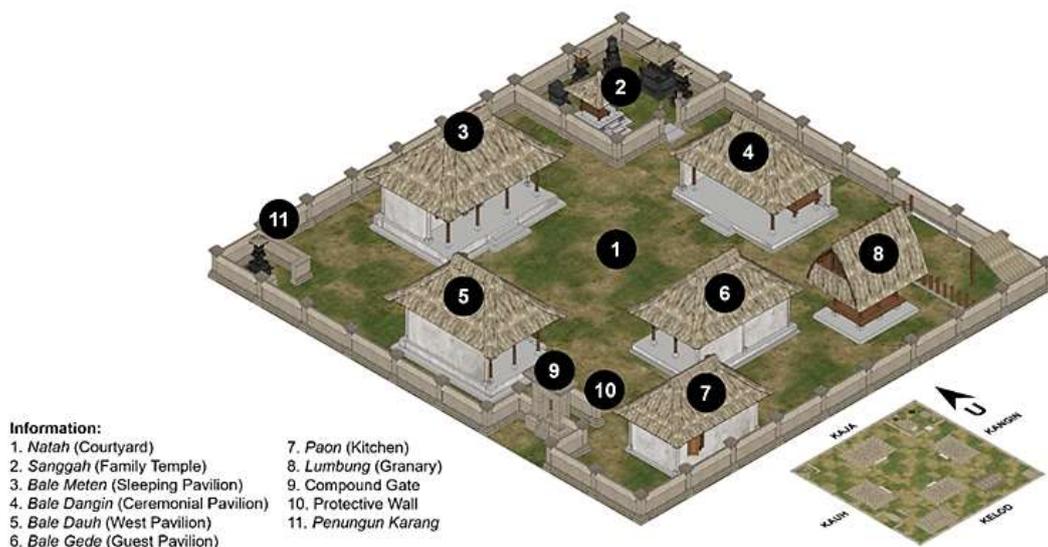| Region	Vernacular Architecture	Transformation Drivers	Key Spatial Changes	Sources
West Africa (Liberia)	Traditional Liberian dwellings	• Urbanization • Industrial materials	Shift from earthen materials to concrete, reconfiguration of communal spaces	Gbatu & Li (2019)
India (Baiga Tribe)	Baiga vernacular houses	• Modernization	Changes in spatial organization, increased use of industrial materials	Patidal et al. (2020)
Zambia (Lamba People)	Lamba traditional houses	• Economic • Technological shifts	Adoption of new materials, alterations in construction techniques	Dioma et al. (2018)
Malysia (Kampong Baru, Kuala Lumpur)	Traditional Malay houses	• Urban densification • Modernization	Vertical extensions, conversion into mixed-use dwellings	Ahmad et al (2022) Ju et al. (2009)
Thailand	Thai vernacular houses	• Adaptation to modern needs	Reimagined spatial layouts to integrate modern amenities	Punpairoj (2018)
China (Rural North China)	Traditional quadrangle houses	• Agricultural shifts • Economic	Transformation of courtyard layouts, integration of multi-functional spaces	Yangang & Jinsheng (2014)
Indonesia (Pinggan Village, Bali)	Traditional Balinese houses	• Adaptation to modern needs	Incremental spatial transformations while maintaining cultural relevance	Muktiwibowo & Wina Satria (2020)
Indonesia (Ubud, Bali)	Traditional Balinese houses	• Commercialization	Spatial transformation	

While this comparative overview provides valuable insights, most existing studies focus on material or functional outcomes without systematically classifying transformation patterns or interrogating how these patterns interact with cosmological or symbolic spatial orders. In response, this study draws on typological and spatial mapping tools to trace how transformation unfolds in TBHs, particularly in tourism-driven environments. Table 2 synthesizes recurring transformation categories from the literature—functional, structural, and partition-based—which provide the analytical framework for this study's classification of spatial change.

Table 2. Categories of Spatial Transformation.

Spatial Transformation Categories	Types	Definition	Sources
Functional Transformation (Changes in the use or purpose of space)	Spatial Conversion	Changing the primary function of a space.	(Widya A, et al. 2020)
	Spatial Reconfiguration	Adjusting spatial layout without changing function.	(Ahmed, 2018) and (Al-Sabbagh, 2020).
Structural Transformations (Physical changes to the building's structure)	Spatial Addition/Removal	Adding or removing sections of a space.	(Dişli, 2018) and (Fakhri & Faraj, 2019).
	Spatial Extension/Subtraction	Expanding or reducing a built-up area.	(Widya A, et al. 2020)
	Vertical Extension	Increasing height by adding new floors.	(Munshed & Ashour, 2024)
Partition-Based Transformation (Changes to internal divisions of space)	Demolition/Construction of Partition	Adding or removing walls to modify interior divisions.	(Widya A, et al. 2020)
	Interior Arrangement Changes	Changing non-structural elements like furniture or built-ins.	(Widya A, et al. 2020)

These categories serve not just to describe transformation, but to interpret how spatial interventions challenge traditional spatial principles such as *Tri Mandala* or *Sanga Mandala* in Balinese architecture. Across contexts, vernacular dwellings reveal a consistent logic: spatial negotiation in response to modern pressures. However, the meaning and consequence of these transformations are deeply context dependent (Widya et al., 2024).

2.2 Traditional Balinese Architecture and Balinese Principles in Spatial Design

Information:
1. *Natah* (Courtyard)
2. *Sanggah* (Family Temple)
3. *Bale Meten* (Sleeping Pavilion)
4. *Bale Dangin* (Ceremonial Pavilion)
5. *Bale Dauh* (West Pavilion)
6. *Bale Gede* (Guest Pavilion)
7. *Paon* (Kitchen)
8. *Lumbung* (Granary)
9. Compound Gate
10. Protective Wall
11. *Penungun Karang*

Figure 1. TBH Compound: Rooms and Structures.

A typical TBH compound comprising several distinct pavilions, each with a specific function (Figure 1). The layout includes structures such as the "*sanggah*" (family temple), "*bale dauh*" (west pavilion), "*bale dangin*" (east pavilion), "*bale gede*" (south pavilion), "*natah*" (open spaces), "*bale meten*," "*paon*" (kitchen), "*lumbung*" (granary), "*angkul-angkul*" (compound gate), and a protective wall. In TBH, each structure within the compound holds a specific function that reflects the cultural and spiritual values of Balinese society. The *sanggah*, or family temple, is the most sacred space within the compound, typically located in the northeast corner, and is dedicated to worship and spiritual practices. The *bale dauh*, positioned in the west, serves as a versatile pavilion for daily activities and sleeping quarters. On the eastern side, the *bale dangin* is primarily used for ceremonies and social gatherings, highlighting its role in community and family events. The *bale gede*, situated in the south, functions as a multipurpose area for large family gatherings and significant ceremonies, underscoring its importance in Balinese cultural life. Central to the compound is the *natah*, an open space that fosters communal gatherings and rituals, creating a sense of community among the inhabitants. The *bale meten* is the master bedroom for the head of the family, symbolizing authority and respect within the household. The *paon*, or kitchen, is essential for preparing meals and storing food, while the *lumbung* acts as a granary, ensuring the family's food security. Finally, the *angkul-angkul* (compound gate) and the surrounding protective wall define the boundary of the TBH, marking the transition from the outside world into the sacred and secure space of the family compound. Each of these components contributes to the holistic design of TBHs, reflecting a balance between functionality, spirituality, and community.
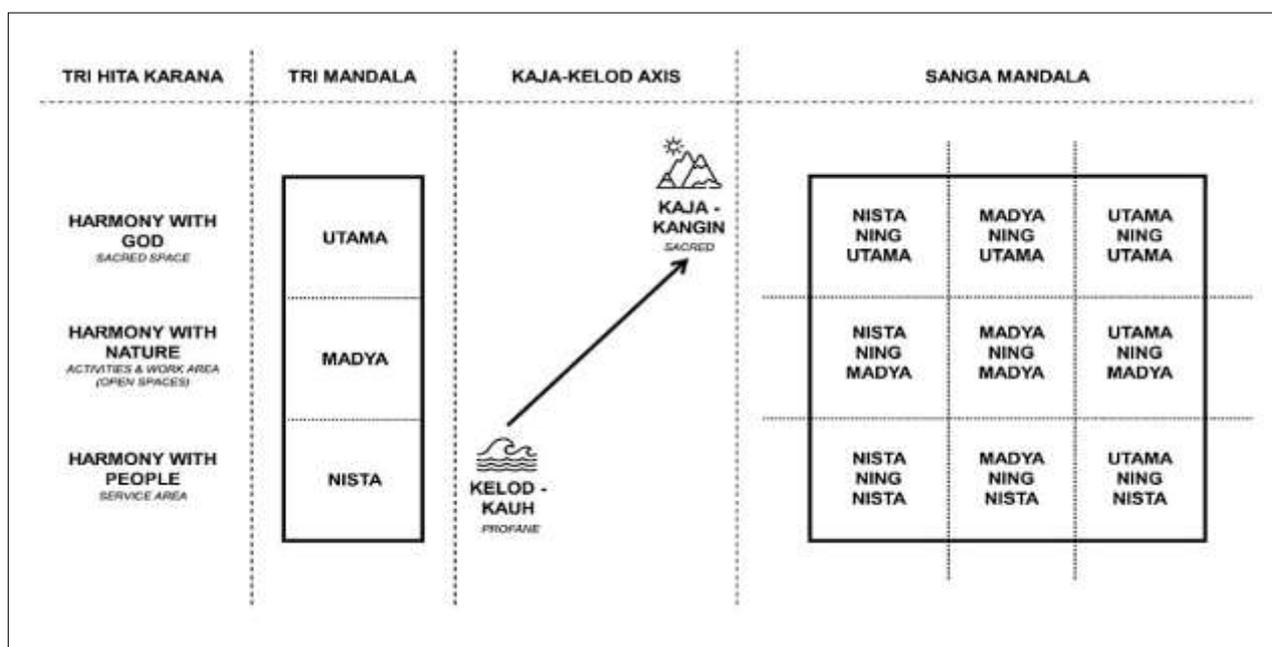

Figure 2. Balinese Principles in TBH Compounds.

Sacred spaces in TBHs are deeply rooted in the *Tri Hita Karana* philosophy (Figure 2), which emphasizes harmony between humans, nature, and the divine. This principle is reflected in the meticulous planning of Balinese houses, where spatial arrangements ensure that living spaces, communal areas, and sacred sites coexist harmoniously (Siwalatri et al., 2015; Wulandari et al., 2021). The *Tri Mandala* concept further reinforces this harmony by dividing the compound into three hierarchical zones: the *utama* (the most sacred area, where the family temple or *sanggah* is located), the *madya* (the intermediate zone for daily activities and communal gatherings, housing structures like *bale dangin* and *bale dauh*), and the *nista* (the outermost zone, designated for mundane functions such as the kitchen or *paon* and storage areas like *lumbung*) (Dewi & Joedawinata, 2021). This zoning ensures a clear separation between the sacred and the profane (Aryani & Tanuwidjaja, 2013). Another crucial element in TBH spatial orientation is the *Kaja-Kelod* axis, which differs from the conventional north-south orientation (Dwijendra, 2021). The *kaja* direction, symbolizing the mountains and considered sacred, dictates that the most spiritually significant structures, such as family temples, are placed closer to the mountains, while the *kelod* direction, associated with the sea and considered

less pure, houses structures of lesser spiritual importance (Hasudungan Irianto Sitinjak et al., 2020). Complementing this orientation, the *Sanga Mandala* concept refines spatial hierarchy by dividing the compound into nine cardinal zones, each associated with different deities and spiritual attributes: *Utama ning Utama, Madya ning Utama, Nista ning Utama, Utama ning Madya, Madya ning Madya, Nista ning Madya, Utama ning Nista, Madya ning Nista*, and *Nista ning Nista*. This intricate spatial division ensures that every structure within the compound is carefully aligned with spiritual forces, reinforcing the belief that architecture is not merely functional but an integral expression of sacred order.

However, in the context of increasing commercialization, these cosmological frameworks are often challenged. TBHs are frequently modified to serve new functions such as cafés, guesthouses, or shops. This transition often involves the relocation, resizing, or repurposing of sacred and communal zones, raising questions about the resilience and adaptability of traditional spatial logics (Putra & Risna Puspita Giri, 2019). Rather than treating these spatial principles as static heritage codes, this study considers them as analytical tools for understanding transformation. In the following section, these frameworks will be mobilized to analyze case studies of TBHs that have undergone commercialization, exploring both the strategies of adaptation and the compromises of cultural continuity.

3.0 METHODOLOGY

This research employs a qualitative methodological approach to investigate commercialization-induced spatial transformations in TBHs. Using a triangulation strategy, the study integrates three primary methods: (1) in-depth interviews with residents, (2) micro-scale spatial mapping, and (3) stakeholder interviews and regulatory document analysis.
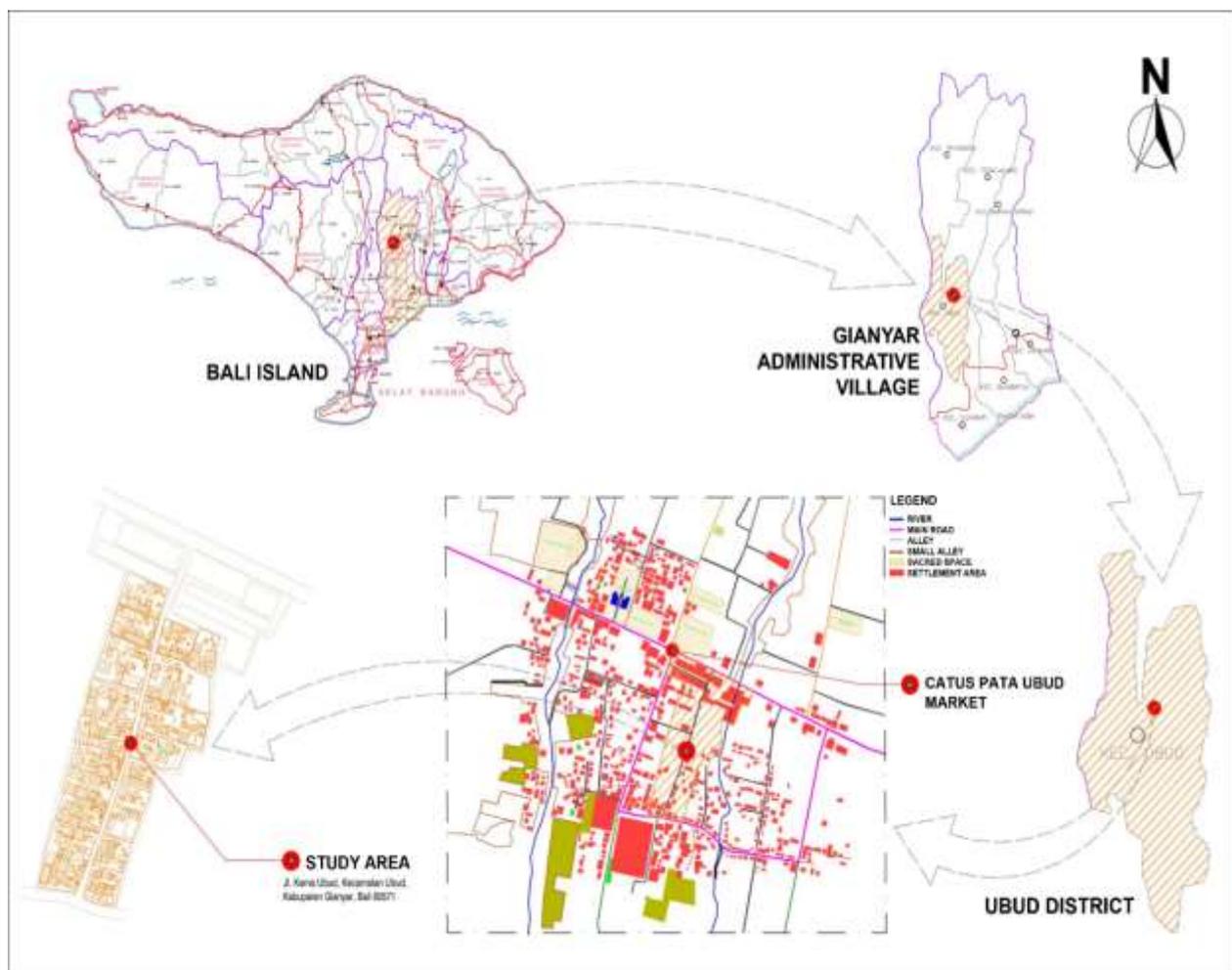

Figure 3. Study Area.

The selection of TBHs was structured to capture diverse spatial transformation patterns and their implications (Yin, 1981). The study focuses on five TBHs in Ubud, selected through purposive sampling (Groat & Wang, 2013) based on their varying degrees of commercial adaptation. Selection criteria included: (1) the extent of spatial modification (e.g., additions, reconfigurations, vertical extensions); (2) the type and scale of commercial integration; and (3) the degree of alignment or deviation from Balinese spatial principles, such as *Tri Hita Karana, Tri Mandala, Sanga Mandala,* and the *Kaja–Kelod* axis.

Research began with semi-structured interviews with TBH residents, focusing on how their homes had evolved over time and the motivations behind these changes. These narratives informed the generation of micro-scale spatial mappings, first hand-drawn on site, then digitized using AutoCAD. To ensure data reliability, this mapping process was conducted iteratively, with findings from interviews and field observations cross-validated through multiple visits and follow-up interviews. Sketches were refined collaboratively and visually verified by both interview participants and a two-person research team. Any inconsistencies were discussed and revised collectively to maintain consistency and accuracy. Spatial changes were classified using a typological framework that categorized transformations into functional, structural, and partition-based types. Peer-checking within the research team, combined with repeated field verification and resident feedback, reinforced the interpretive reliability of both visual and narrative data.

Following this, the study conducted additional interviews with local stakeholders, including religious and community leaders, to understand how the transformations are perceived within the local customary framework. This was supplemented with a review of regulatory documents, particularly the Bali Provincial Regulation No. 5 of 2005, which provides general guidelines for building architecture in Bali. Although no specific regulation governs TBHs, the study also references *Asta Kosala-Kosali*, a customary spatial guideline transmitted orally and through lontar manuscripts.

Rather than aiming for generalizability across all of Bali, the selected cases are intended to represent similar patterns of adaptation in other urbanized and tourist-saturated areas. Although subjectivity is inherent in interpretive research, triangulation across spatial mapping, interviews, and regulatory analysis enhances the study's credibility and provides a more holistic understanding of how commercialization reshapes both space and meaning in Balinese vernacular architecture.

4.0 FINDINGS & DISCUSSION

4.1 Navigating Change: The Spatial Transformation Patterns in TBHs Amidst Commercialization

This section addresses the first research question: What are the predominant spatial transformation patterns in TBHs because of commercialization? Drawing on five case studies located along Jalan Karna in Ubud, three major spatial transformation patterns were identified: spatial conversion, spatial reconfiguration, and spatial addition or vertical extension. These transformations largely reflect residents' efforts to adapt their homes for commercial purposes while negotiating the preservation of cultural values.

Across the cases, spatial conversion often involved repurposing traditional pavilions, such as the *bale dauh* and *bale dangin*, into guest accommodations, art shops, or cafes. In one case, the *jineng* (rice barn) was transformed into a retail display area, while in another, a sleeping pavilion was converted into a boarding house. Spatial reconfiguration was commonly observed in kitchens, sleeping quarters, and communal spaces to accommodate more intensive uses. Vertical extensions were introduced in two of the five cases, particularly in properties serving as homestays or boarding houses, marking a notable departure from the traditional single-story logic of TBHs.

Micro-scale spatial mapping illustrated these physical alterations, while in-depth interviews revealed that the transformations were primarily driven by economic considerations—such as tourism demands, increased land value, and intergenerational household needs. Residents generally prioritized preserving the *merajan* (family temple), while showing flexibility in adapting the more secular or functional parts of the compound. For example, one household chose to relocate the *merajan* to the second floor rather than dismantle it, maintaining its function while accommodating vertical growth. This finding suggests a strong attachment to the spiritual core of the TBH, even amid substantial spatial reorganization. As one resident explained,

"Asal merajan tetap utuh dan bisa digunakan untuk sembahyang, bagian lain bisa kami sesuaikan dengan kebutuhan zaman." ("As long as the merajan remains intact and usable for worship, other parts can be adjusted to suit current needs.") – 1st Participant

Another resident described their decision to convert the bale dangin into a retail shop:

"Kami ingin tetap tinggal di sini, tapi juga perlu pemasukan. Jadi, kami ubah bagian depan untuk toko, tapi kami tetap jaga tata ruang utamanya." ("We want to continue living here, but we also need income. So, we turned the front area into a shop, but we still preserve the main spatial order.") – 3rd Participant

Table 3 summarizes the transformation patterns observed across the five case studies, categorized into spatial conversion, reconfiguration, addition/removal, vertical extension, and partition or interior arrangement changes. Figures 4–5 visualize these changes in compound layouts.
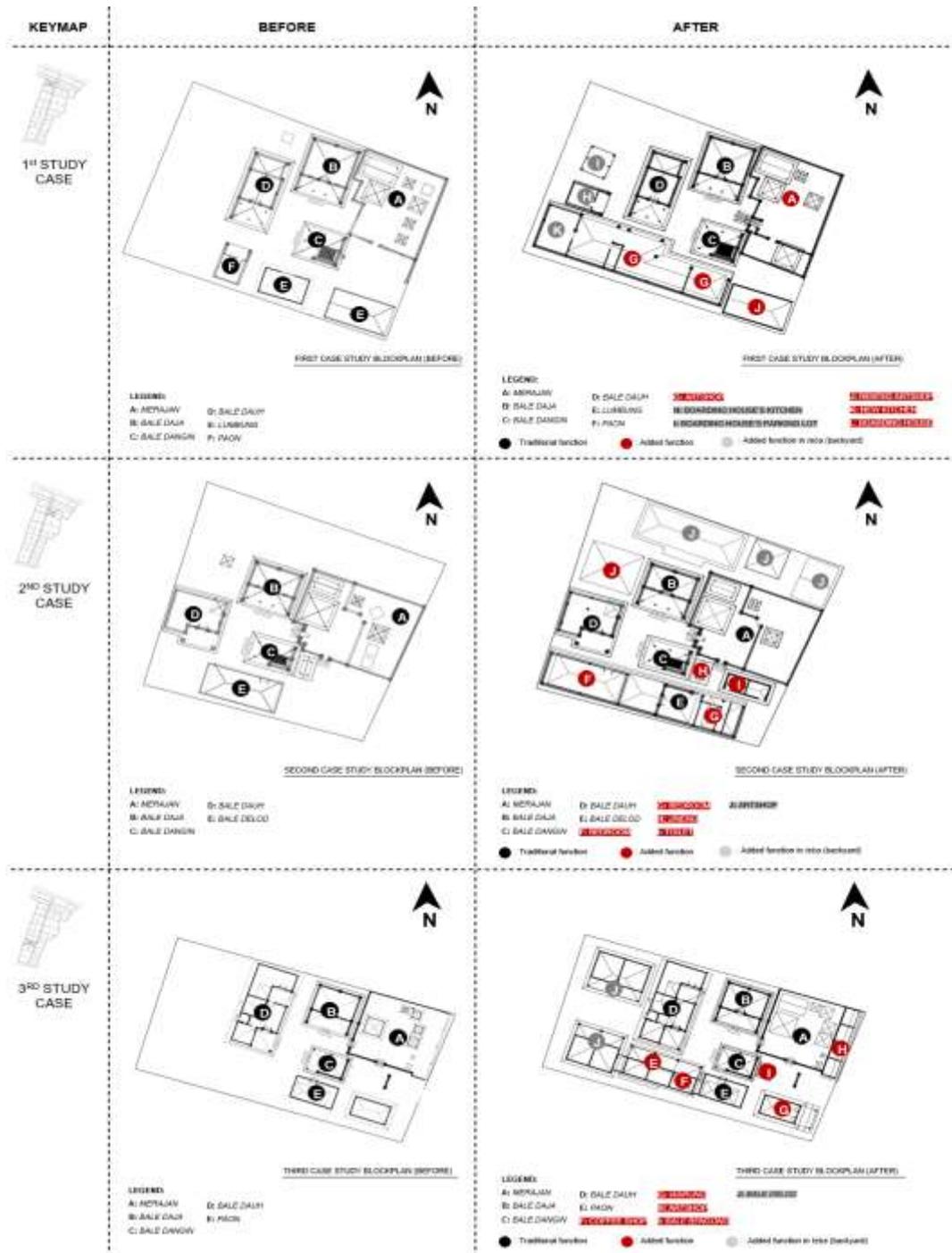

Figure 4. Spatial Transformation of 1st – 3rd Study Case
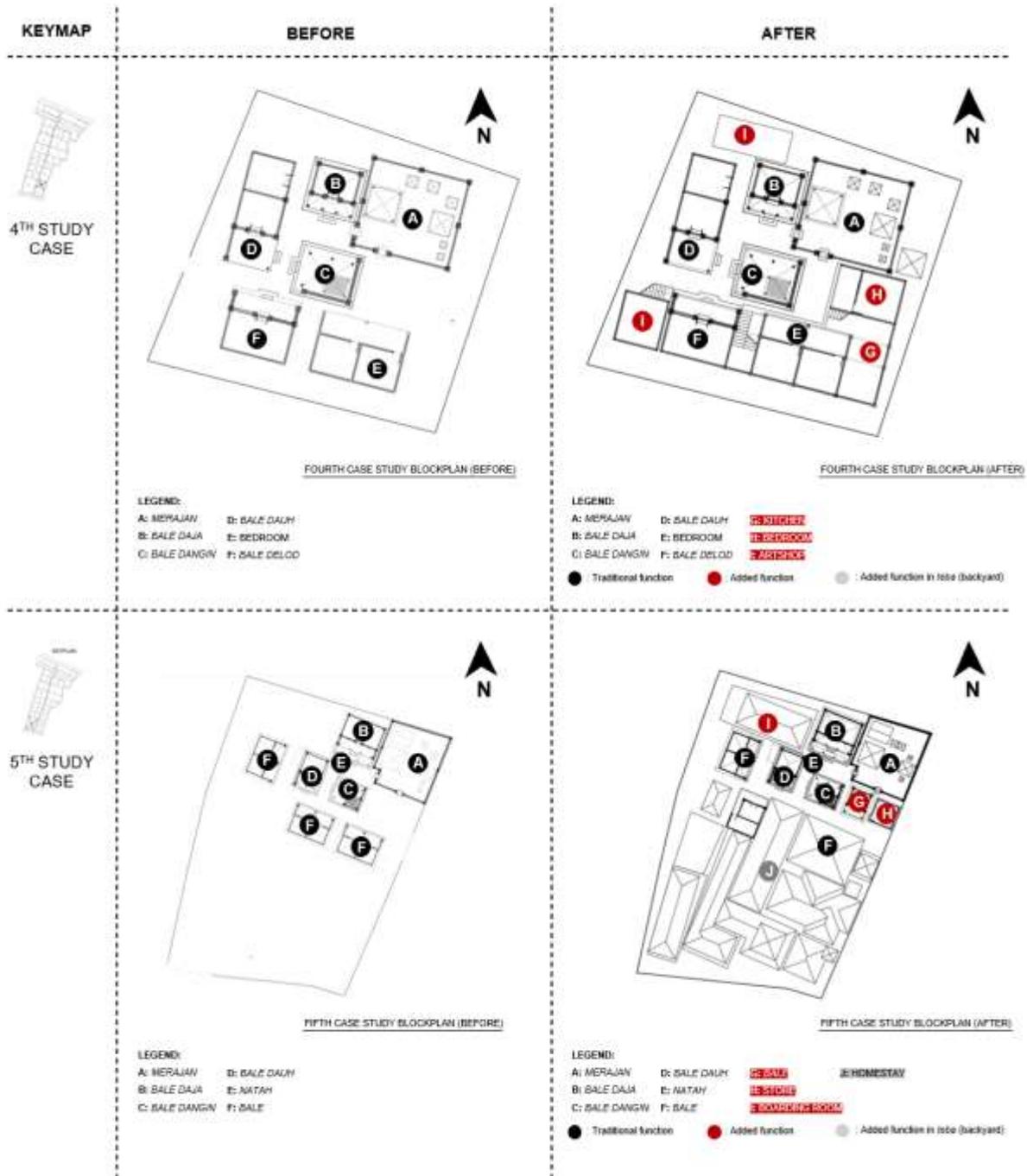
Figure 5. Spatial Transformation of 4th – 5th Study Case

The findings reveal that spatial conversion, spatial reconfiguration, and spatial addition/removal are the predominant transformation patterns in TBHs due to commercialization (Table 3). These transformations primarily involve the repurposing of traditional domestic spaces into retail, hospitality, and food & beverage establishments, restructuring original spatial hierarchies. Spatial reconfiguration, particularly in kitchens and sleeping pavilions, accommodates commercial activities while maintaining the overall architectural layout. Spatial additions, such as new art shops, guest rooms, and secondary kitchens, frequently occur in backyards and peripheral spaces, demonstrating how TBHs adapt by extending their functional capacity. Vertical expansion is most commonly observed in hospitality-related functions, where additional floors accommodate rental spaces, diverging from the traditional single-story TBH layout.

Table 3. Spatial Transformation Types in Each Case Study.

Study Case	a	b	c	d	e	f	g
1st Study Case	✓ Art shop added in previous residential space	✓ Kitchen reconfigured for boarding house use	✓ New art shop and kitchen added in backyard	✓ Boarding house space extended	✓ New second-floor space	X	X
2nd Study Case	✓ Residential space converted into a retail/art shop	✓ Reconfiguration of bedroom and additional kitchen	✓ Addition of bedroom and toilet	✓ Backyard restructured for retail	✓ New second-floor area	✓ New partitions created for added functions	X
3rd Study Case	✓ Café and retail shop replaced previous household function	✓ *Bale Bengong* converted for commercial use	✓ Addition of new comercial spaces	✓ Some open space absorbed into built-up area	X	✓ Partition added for shop functions	X
4th Study Case	✓ Bedroom repurposed for commercial lodging	✓ Bale reconfigured for shop function	✓ Addition of an art shop and kitchen	✓ Some areas expanded for rental use	✓ New second-floor addition	X	X
5th Study Case	✓ Bale converted into store	✓ Homestay area created within existing layout	✓ Additional boarding rooms	✓ Some spaces expanded	X	X	X

*Information:

a: Spatial Conversion

b: Spatial Reconfiguration

c: Spatial Addition/Removal

d: Spatial Extension/Subtraction

e: Vertical Extension

f: Demolition/Construction of Partition

g: Interior Arrangement Changes

A pattern emerges between commercialization typologies and spatial transformation types. Retail functions primarily drive spatial conversion, repurposing existing pavilions into art shops or souvenir stores, often supplemented by minor spatial additions. Food & beverage establishments, such as cafés and *warungs*, favor ground-level modifications, utilizing courtyards (*natah*) or peripheral zones for customer seating, leading to spatial extension and partition changes. Hospitality, particularly boarding houses and homestays is the main driver of vertical expansion, as rental accommodations necessitate increased capacity, resulting in multi-story structures that depart from traditional TBH spatial logic.

Table 4 further analyzes these findings by categorizing patterns according to commercialization typologies—retail, hospitality, and food & beverage—and linking them to specific spatial changes. This comparison demonstrates that the type of economic function significantly influences how and where transformation occurs. For example, hospitality uses more vertical expansion to meet lodging capacity, while

F&B favors modifying open communal spaces like the natah. Retail, on the other hand, often utilizes conversion and minor additions, strategically preserving ground-floor accessibility for consumer engagement. This categorization highlights how commercial intent plays a decisive role in the scale and typology of spatial interventions.

Table 4. Patterns Between Commercialization Typologies and Spatial Transformations.

Commercialization Typology	Common Spatial Transformation Types	Key Observations
Retail (Artshops, Stores, Souvenir Shops)	• Spatial Conversion (previous residential spaces turned into shops) • Spatial Addition (new retail spaces added) • Spatial Extension (expanding existing space for commercial purposes) • Partition Changes (new walls to separate commercial areas)	• Retail spaces are often integrated into existing residential layouts by repurposing bale structures or creating small standalone shops in open areas. • Shops tend to remain on the ground floor, avoiding vertical expansion unless combined with other functions (e.g., homestay + retail).
Hospitality (Boarding Houses, Homestays, Lodging)	• Vertical Extension (new floors added for accommodation) • Spatial Conversion (reusing bale or bedrooms for lodging) • Spatial Addition (adding new lodging units) • Interior Reconfiguration (rearranging internal spaces for accommodation)	• Hospitality frequently requires vertical expansion to accommodate multiple guests, making it the most common driver of multi-story transformations in TBHs. • Private bedrooms and communal spaces are often repurposed into guest rooms. • Open courtyards or *teba* (backyard) areas are sometimes converted into shared facilities (e.g., shared kitchens for boarding houses).
Food & Beverage (Cafés, Warungs,	• Spatial Addition (creating outdoor or semi-outdoor seating) • Spatial Extension (expanding built-up area for dining) • Partition Changes (separating seating from private spaces)	• Food & Beverage businesses favor open, interactive spaces, often leading to the modification of *natah* (courtyard) areas into semi-public spaces. • Kitchens are often expanded or added in new locations to accommodate food preparation. • Unlike hospitality, F&B businesses rarely require vertical expansion, as they prioritize ground-level accessibility for customers.

In conclusion, commercialization has resulted in the transformation of TBHs through a variety of spatial strategies that reflect both market-driven imperatives and cultural considerations. These changes are not uniform but vary depending on the type of economic function introduced—retail, hospitality, or food and beverage—each shaping the architectural adaptation differently. Despite this diversity, a common pattern is the careful negotiation between economic utilization and the symbolic maintenance of sacred spatial zones, especially the *merajan*.

The following section further investigates how these transformations interact with traditional Balinese spatial principles. It explores to what extent the evolving spatial logic of TBHs aligns with or deviates from established cosmological frameworks such as *Tri Hita Karana, Tri Mandala, Sanga Mandala,* and the *Kaja–Kelod* axis.

4.2 Commercialization-Driven Spatial Transformations in TBHs: Patterns and Implications

This section still addresses the first research question: How do these spatial changes align with or deviate from traditional Balinese spatial principles, including *Tri Hita Karana, Sanga Mandala, Tri Mandala, a*nd *the Kaja-Kelod* Axis?

Findings show that sacred spatial orders, especially the placement and orientation of the merajan, are largely respected across all five cases (Figure 6-7). Residents consistently preserved the *merajan* in its original location or, where necessary, relocated its upward without compromising its function or cosmological orientation. This reflects a continued adherence to *Tri Hita Karana* and the principle of maintaining balance between humans, nature, and the divine.

In relation to Balinese spatial principles, these transformations reveal a delicate negotiation between preservation and adaptation. The *Tri Mandala* and *Kaja-Kelod* zoning principles remain partially upheld, with sacred spaces (*Merajan*) consistently preserved in the *Utama* (sacred) zone. However, the encroachment of commercial functions into the *Madya* (intermediate) and *Nista* (profane) zones disrupts the spatial logic that historically maintained a clear separation between sacred, communal, and economic spaces. The *Tri Hita Karana* philosophy, which emphasizes harmony between humans, nature, and the divine, is increasingly challenged as economic pressures push traditional domestic functions into commercially oriented spaces.

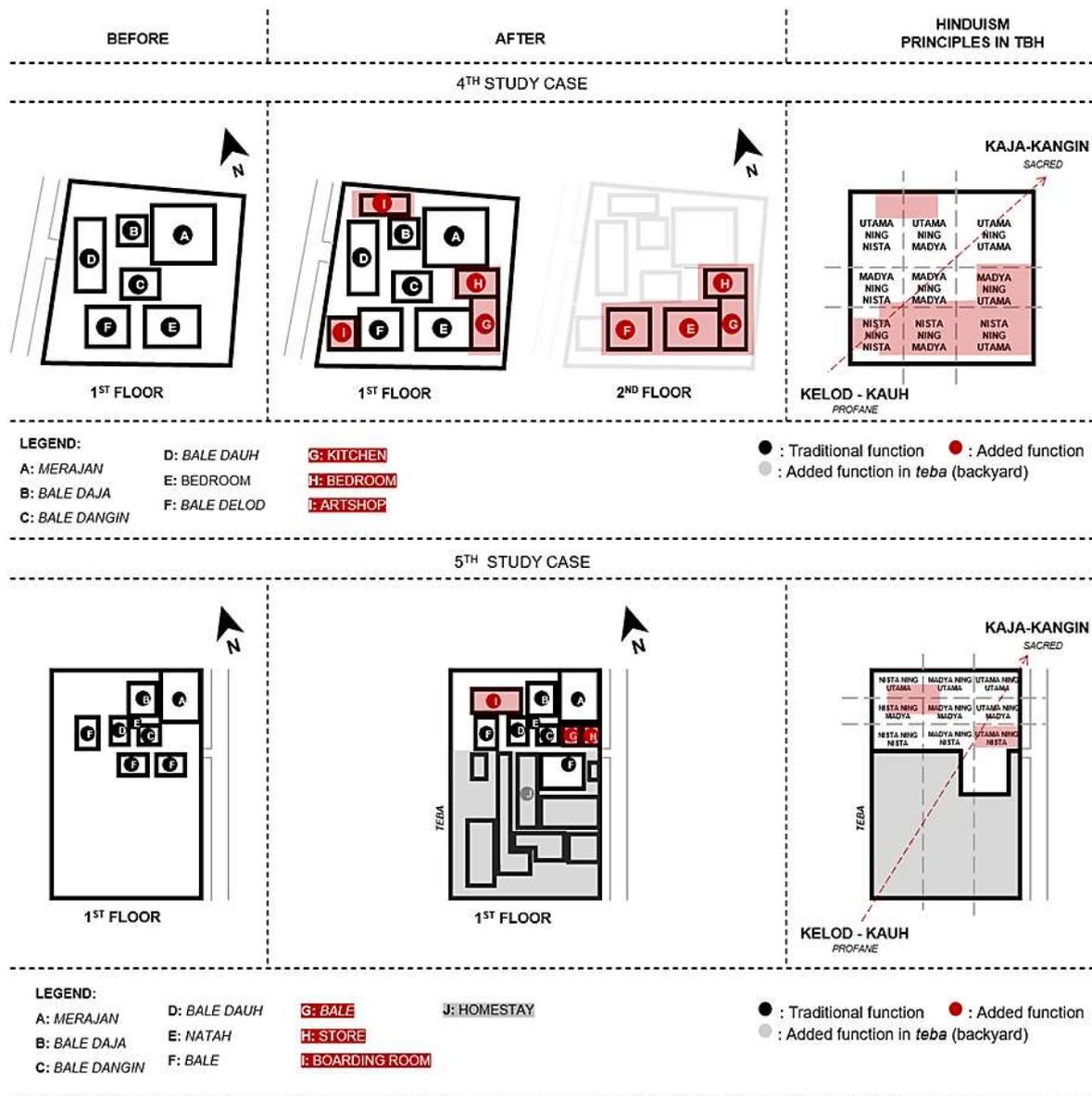**Figure 6.** Spatial Transformation Patterns of 1st – 3rd Case Study.

Figure 7. Spatial Transformation Patterns of 4th – 5th Case Study.

One of the key observations from the study is that sacred spaces, particularly the *merajan* (family temple), remain largely preserved across all cases. This adherence reflects the continued reverence for *tri hita karana*, which emphasizes harmony between humans, nature, and the divine. The *merajan* is consistently located in the *utama* (most sacred) zone, aligned with the *kaja-kangin* direction (toward the mountains and sunrise), preserving its function as the spiritual core of the compound. However, while sacred spaces remain intact, the surrounding communal and residential areas have undergone significant alterations, demonstrating a shift in spatial priorities.

The *madya* (intermediate) and *nista* (profane) zones, traditionally used for communal and household activities, have seen the most extensive modifications due to commercialization. *bale bengong, bale dauh,* and *bale delod*, which once served as sleeping areas or social spaces, have been converted into art shops, cafés, and guest accommodations. This spatial reallocation challenges S*anga Mandala* and *Tri Mandala* principles, which dictate clear zoning between sacred, communal, and profane areas. In some cases, commercial activities extend into areas that were traditionally considered *Madya* spaces, blending communal and economic functions in ways that blur traditional boundaries.

91

Another significant transformation is the vertical extension observed in some case studies. Traditional Balinese architecture is predominantly single-story, reflecting cultural and environmental considerations, including the relationship between human scale, sacred spatial proportions, and local climatic conditions. The introduction of second-floor guest accommodations and retail spaces represents a departure from the traditional layout, disrupting the horizontal spatial logic that once defined TBHs. This alteration is driven by land-use efficiency and economic pressures rather than adherence to traditional principles, marking a clear deviation from *Tri Hita Karana's* balance between built space and open space.

Despite these disruptions, certain adaptive strategies indicate an effort to maintain traditional spatial logic while integrating commercial functions. In some cases, new commercial activities are deliberately placed in the *Nista* zone, aligning with the *Kaja-Kelod* Axis, which dictates that the most profane or least sacred activities should be positioned toward the *Kelod* (sea) direction. Additionally, outdoor areas such as the *Teba* (backyard) and *Telajakan* (green space) are frequently repurposed for commercial use, rather than intruding upon the core ceremonial spaces, demonstrating a negotiation between economic expansion and cultural continuity.

Vertical expansion, while not inherently incompatible with Balinese philosophy, introduces a major spatial shift that is not traditionally accounted for in the single-story organization of TBHs. Nonetheless, in some cases, residents tried to maintain symbolic zoning by assigning upper floors to profane or commercial uses and preserving lower floors for ritual or residential functions. These adaptations demonstrate an ongoing negotiation between traditional spatial logic and contemporary commercial demands.

4.3 Governance, Custom, and the Future of Spatial Identity in TBHs

This section responds to the second research question: How do residents and stakeholders perceive, negotiate, or resist these transformations within Ubud's cultural and regulatory landscape? Beyond the physical alterations, transformations in TBHs reflect a deeper restructuring of spatial meaning under commercialization pressures.

Resident interviews consistently reflected a pragmatic ethic: preserving ritual integrity while adapting spatial form to economic necessity. The *merajan* was seen as inviolable, but other zones were open to reinterpretation. As one resident shared, *"Yang penting upacara tetap jalan. Bale yang lain bisa untuk tamu atau toko."* ("As long as the ceremonies continue, the other pavilions can be used for guests or shops.") – 3rd Participant. This pragmatism aligns with what Rapoport described as the "core–non-core" structure in vernacular architecture, where the sacred core is highly resistant to change, while peripheral areas accommodate external influences (Lozar & Rapoport, 1970; Rapoport, 2005). Yet, when economic activities continually encroach on formerly communal or domestic zones, the symbolic hierarchy of the compound becomes increasingly fragmented. Over time, these cumulative changes risk eroding the spatial identity that once embedded cultural meaning into the built environment.

This pragmatism is embedded in local governance norms, as illustrated by the *Kepala Lingkungan* of Ubud Kelod. He confirmed that transformations rarely impact core ceremonial zones. Spatial adjustments— such as relocating kitchens, adding partitions, or converting the natah—are typically negotiated through informal consensus. *"Yening ada upacara, biasane tiang ngelingang lewat grup,"* he noted, underscoring how ceremonial boundaries are socially upheld even in dense urban settings.

However, the absence of formal guidelines specific to TBHs has opened room for interpretive flexibility and confusion. While Bali's Provincial Regulation No. 5 of 2005 outlines broad architectural identity principles, it does not address internal TBH organization. Customary spatial law, such as Asta Kosala-Kosali, remains influential, but is mostly transmitted orally and selectively understood. *"Biasanya nanya ke pemangku kalau bingung,"* a resident noted, suggesting a reliance on community elders over written codification. From a regulatory standpoint, Peraturan Daerah Provinsi Bali No. 5 Tahun 2005 tentang Persyaratan Arsitektur Bangunan Gedung establishes that all buildings must adhere to principles of Tri Hita Karana, maintain Balinese architectural identity, and respect environmental harmony (Pasal 2–3). The regulation further mandates in Pasal 10 that traditional houses follow norma pembangunan tradisional Bali—yet it lacks specificity on how this

applies to hybrid or commercialized TBHs. Additionally, Pasal 6 prohibits building function changes that conflict with spatial plans, but enforcement has proven weak, especially in informal or high-pressure zones like Jalan Karna. As the Kepala Lingkungan stated, *"Nenten wenten aturan sane netepang patut lan ten patut nyambungang lantai kalih… sami ngalantur."* ("There is no rule to determine whether second floors are appropriate… everyone just adjusts as they see fit.").

From a long-term perspective, this fragmented regulatory environment poses risks for the continuity of TBHs as culturally embedded spaces. Without intervention, the gradual absorption of communal and profane zones into commercial functions may lead to a functional hollowing of spatial symbolism. Rapoport (1982) warned that vernacular environments lose cultural legibility when their spatial organization no longer reflects their original meaning systems. In the context of Ubud, this signals the urgent need for proactive heritage planning. Future efforts must move beyond architectural aesthetics toward zoning overlays, context-based design guidelines, and derivative policies that clearly define acceptable transformation thresholds. Such instruments can provide clarity to both residents and local administrators, ensuring that the sacred–secular order remains legible and respected. Without these, TBHs risk becoming increasingly commercial facades, severed from the ritual practices and spatial identities that once defined them.

5.0 CONCLUSION

The commercialization of TBHs reveals a complex relationship between spatial adaptation and cultural continuity. This study identified three dominant spatial transformation types: spatial conversion, spatial reconfiguration, and vertical extension. These changes are closely associated with commercialization typologies such as hospitality, retail, and food and beverage, each exerting different spatial pressures on TBHs. While sacred zones like the merajan remain largely intact, commercial uses increasingly occupy communal (Madya) and profane (Nista) areas. This shift disrupts the spatial coherence defined by Balinese principles such as Tri Mandala, Sanga Mandala, and the Kaja–Kelod axis. The introduction of upper floors and mixed-use layouts marks a significant departure from the traditionally horizontal organization of TBHs. These transformations reflect not only physical change but also the gradual erosion of symbolic spatial order.

To protect the long-term identity of TBHs, the study proposes three policy directions. First, zoning overlays should be introduced to regulate where and how commercial adaptations occur, particularly in high-pressure areas like Jalan Karna. Second, visual planning tools derived from Asta Kosala-Kosali can help translate traditional principles into accessible design guidelines. Third, all future regulation should involve collaboration with community leaders and residents to ensure that both cultural values and economic realities are reflected in policy. Although Bali's Perda No. 5 Tahun 2005 articulates cultural aspirations, it lacks enforcement strength and does not sufficiently address internal transformations in TBHs. Informal community regulation continues to be important, but it must be supported by formal planning systems that can adapt to rapid change while preserving meaning.

By classifying commercialization-induced transformation patterns and linking them to economic typologies, this study contributes to a deeper understanding of how vernacular architecture evolves in tourism economies. Rather than resisting change, the goal is to shape it. The critical question is not how much a TBH can transform, but how transformation can be guided to preserve both its function and cultural meaning in the evolving urban fabric of Bali.

6.0 REFERENCES

Ahmad, S., Yetti, A. E., Ali, N. E., Sanusi, M. S., & Samsudin, P. Y. (2022). Adaptation of traditional Malay house design towards housing comfort and satisfaction. Malaysian Journal of Society and Space, 18(3). https://doi.org/10.17576/geo-2022-1803-14

Altman, I., Rapoport, A., & Wohlwill, J. (1980). Human Behaviour and Environment. Springer Science+Business Media. https://doi.org/10.1007/978-1-4899-0451-5

Aritama, A. A. N., & Putra, I. D. G. A. D. (2021). Tourism Activities in the Traditional Balinese House: The Challenges of Designing a Homestay in Gianyar Bali. Journal of Social and Political Sciences, 4(1). https://doi.org/10.31014/aior.1991.04.01.250

Aryani, N. P., & Tanuwidjaja, G. (2013). SUSTAINABLE ARCHITECTURAL DESIGN IN A TRADITIONAL BALINESE HOUSING IN ACCORDANCE TO THE CONCEPT OF TRI MANDALA. Journal of Architecture&ENVIRONMENT, 12(2), 113. https://doi.org/10.12962/j2355262x.v12i2.a561

Dewi, R. S., & Joedawinata, A. (2021). Tri Mandala in the Layout of Pakraman Penglipuran Bangli, Bali. ARTic, 4(1), 373–382. https://doi.org/10.34010/artic.v4i1.4790

Dioma, B. N., Malama, A., & Munshifwa, E. K. (2018). African Vernacular Architecture, Culture and Modernity: An Investigation Among the Lamba People of Chief Mushili on the Copperbelt Province of Zambia. Journal of Asian and African Studies, 53(7), 1102–1117. https://doi.org/10.1177/0021909618765018

Dwijendra, N. K. A. (2021). The Complexity of Orientation in Traditional Village Architecture in Bali, Indonesia. Humanities Diliman, 18(1), 99–117.

Gbatu, J. N., & Li, H. (2019). The Transformations of Vernacular / Traditional Architecture to Modern Architecture in West Africa, Liberia. Proceedings of the 2019 International Conference on Architecture: Heritage, Traditions and Innovations (AHTI 2019). https://doi.org/10.2991/ahti-19.2019.37

Groat, L. N., & Wang, D. (2013). Architectural Research Method. In Architectural research methods.

Hasudungan Irianto Sitinjak, R., Kusuma Wardani, L., & Firtatwentyna Nilasari, P. (2020). Traditional Balinese Architecture: From Cosmic to Modern. SHS Web of Conferences, 76, 01047. https://doi.org/10.1051/shsconf/20207601047

Hyde, R. (2018). The evolution of buildings and cities. Adapting to changing environmental conditions from urbanization. Architectural Science Review, 61(1–2), 1–3. https://doi.org/10.1080/00038628.2018.1438788

Ju, S.-R., Omar, S., & Ko, Y.-E. (2009). Modernization of Traditional Malay House in the Kampong Baharu (Kuala Lumpur). GEST 2009 - Green Tech, Eco Life & Sustainable Architecture for Cities of Tomorrow, 334–341.

Li, J., Peng, X., Li, C., Luo, Q., Peng, S., Tang, H., & Tang, R. (2023). Renovation of Traditional Residential Buildings in Lijiang Based on AHP-QFD Methodology: A Case Study of the Wenzhi Village. Buildings, 13(8), 2055. https://doi.org/10.3390/buildings13082055

Lozar, C., & Rapoport, A. (1970). House Form and Culture. In Prentice-Hall, Inc. https://doi.org/10.2307/3331293

Muktiwibowo, A. K., & Wina Satria, M. (2020). Coping Strategies in Vernacular Architecture: Adaptation and Adjustment for Contemporary Needs at Pinggan Village, Kintamani, Bali. In Reframing the Vernacular: Politics, Semiotics, and Representation (pp. 173–178). Springer International Publishing. https://doi.org/10.1007/978-3-030-22448-6_14

Nabilunnuha, M. B., & Novianto, D. (2022). Prinsip Keberlanjutan dan Ketahanan Lingkungan pada Rumah Tongkonan Toraja. Jurnal Lingkungan Binaan Indonesia, 11(1), 28–38. https://doi.org/10.32315/jlbi.v11i01.79

Oliver, P. (2007). Built to Meet Needs: Cultural Issues in Vernacular Architecture. Routledge. https://doi.org/10.4324/9780080476308

Patidar, S., Raghuwanshi, B., & Tiwari, S. (2020). Transformation in Vernacular Architecture of Baiga Tribe of Central India. In Reframing the Vernacular: Politics, Semiotics, and Representation (pp. 107–126). Springer International Publishing. https://doi.org/10.1007/978-3-030-22448-6_10

Paturusi, S. A., & Widiastuti. (2023). Traditional Balinese Architecture as a Tourist Attraction in Bali: An Architect's Perspective. ASTONJADRO, 12(3), 897–906. https://doi.org/10.32832/astonjadro.v12i3.14321

Pemerintah Provinsi Bali. (2005). Peraturan Gubernur Bali No. 5 Tahun 2005 tentang Persyaratan Arsitektur Bangunan Gedung (5).

Philokyprou, M. (2015). Continuities and Discontinuities in the Vernacular Architecture. ATHENS JOURNAL OF ARCHITECTURE, 1(2), 111. https://doi.org/10.30958/aja.1-2-2

Pranajaya, I. K., Suda, I. K., & Subrata, I. W. (2020). Marginalization of Bali traditional architecture principles. International Journal of Linguistics, Literature and Culture, 6(5), 10–20. https://doi.org/10.21744/ijllc.v6n5.975

Punpairoj, P. (2018). Recalibrating the New Thai Vernacular Architecture. Journal of Architectural/Planning Research and Studies (JARS), 7(2), 65–80. https://doi.org/10.56261/jars.v7i2.168844

Putra, I. D. G., & Risna Puspita Giri, K. (2019). House as Work Place in Ubud Tourism Area. KnE Social Sciences. https://doi.org/10.18502/kss.v3i21.4980

Rapoport, A. (2005). Culture, architecture, and design. In Architectural and planning research book series.

Sari, N. L. K. I., & Kusuma, I. M. W. (2020). Nilai Filosofis Tata Ruang Bangunan Tradisional Bali dalam Teks Asta Kosala Kosali. Sphatika: Jurnal Teologi, 11(1), 88. https://doi.org/10.25078/sp.v11i1.1497

Sarjana, I. P., Gelgel, I. P., & Utama, I. W. B. (2020). The Dynamics of Tri Hita Karana Implementation in The Balinese Hindu Residence in South Denpasar. International Journal of Interreligious and Intercultural Studies, 3(2), 58–68. https://doi.org/10.32795/ijiis.vol3.iss2.2020.1091

Siswadi, G. A., & Dwiputri Maharani, S. (2023). Dimensi Aksiologis pada Tata Letak Bangunan di Bali Berdasarkan Lontar Asta Kosala Kosali. Sphatika: Jurnal Teologi, 14(2), 126–141. https://doi.org/10.25078/sphatika.v14i2.3038

Siwalatri, N. K. A., Prijotomo, J., & Setijanti, P. (2015). Spatial Concepts of Bali Indigenous Architecture. Procedia - Social and Behavioral Sciences, 179, 118–127. https://doi.org/10.1016/j.sbspro.2015.02.415

Wardana, A. (2015). Debating Spatial Governance in the Pluralistic Institutional and Legal Setting of Bali. The Asia Pacific Journal of Anthropology, 16(2), 106–122. https://doi.org/10.1080/14442213.2014.997276

Wicaksana, I. B. A. (2018). The Art of Space and Architecture; Asta Kosala Kosali and Asta Bumi. Bali Tourism Journal, 2(1), 14–18.

Widya, A. T., N, A., Aziza, M. R., Tanjung, A. S., Kurniawan, G. K., Basica, E. A. A., S, R., & Pratama, Z. A. R. R. (2024). Housing spatial transformation as a translation of community resilience in Kampung Cungkeng, Bandar Lampung City. IOP Conference Series: Earth and Environmental Science, 1361(1), 012020. https://doi.org/10.1088/1755-1315/1361/1/012020

Wijaya, K. A. P., & Wiranegara, H. W. (2020). BALINESE PLANNING PHILOSOPHY: IMPLEMENTATION IN DENPASAR CITY PLAN. International Journal on Livable Space, 5(1), 11–20. https://doi.org/10.25105/livas.v5i1.6352

Wulandari, A. A. A., Yogita, S. B., & Simanjuntak, P. M. (2021). The Application of Balinese Tri Hita Karana and Tri Loka Concept in Children's Creativity Hub in Kuta, Bali. IOP Conference Series: Earth and Environmental Science, 794(1), 012242. https://doi.org/10.1088/1755-1315/794/1/012242

Yangang, F., & Jisheng, L. (2014). The modification of North China quadrangles in response to rural social and economic changes in agricultural villages: 1970–2010s. Land Use Policy, 39, 266–280. https://doi.org/10.1016/j.landusepol.2014.02.009

Yin, R. K. (1981). The Case Study as a Serious Research Strategy. Knowledge, 3(1), 97–114. https://doi.org/10.1177/107554708100300106