



The Balinese Ethnic Community's Perceptions in Regards to Modifications in Denpasar's Residential Building Spatial Planning

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Abstract

The increase influences changes in the spatial layout of Balinese ethnic residences in Denpasar in the number of family members, the growth in the community's economy, and the availability of residential yard land, which is decreasing. On the one hand, the Balinese ethnic community in Denpasar still has a perception of direction and orientation of significant (high) and obnoxious (low) values or luan and teben orientations as the forerunner to the spatial configuration of Balinese ethnic residences with the concept of zoning of the Sanga Mandala tread. This study aims to conceive of the Denpasar community's perception of the arrangement of residential houses amid increasing residential space needs. The method used is descriptive qualitative through empirical studies by conducting in-depth observations and interviews to understand the Denpasar community's understanding of structuring their homes. This study found that the Balinese ethnic community perceives changes in their homes' spatial layout based on literacy and adaptation; the Denpasar community understands the demands of residential space needs through a spatial transformation based on transformation spatial concepts of Balinese architecture.

Keywords: perception, spatial change, spatial literacy, spatial adaptation.

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1. INTRODUCTION

The heterogeneous development of Denpasar affects changes in the spatial layout of Balinese ethnic residences. The three developments in question are the economy's state, the population's growth, and Denpasar's pattern of residential building types. One family's population growth necessitates the need for increased living space. These augmentations take the shape of additional nuclear family members or augmentations

from other families (e.g., a married son who brings his wife to live in the main house). Of course, residential land (space) is closely related to population growth. Usually, create extra space by enlarging the existing structure to provide room for the different numbers of family members. Can find this problem in people who still live in old houses. The influence demonstrates the spatial change of residential arrangements to the growing number of inhabitants inhabiting the space. As a result, it is essential to think sustainably

about these residential spaces (Arvisista & Dwisusanto, 2020; Mukiibi & Machyo, 2021; Puspita & Rahmi, 2020; Sunarti et al., 2019; Tawayha et al., 2019).

The development of the local economy has an impact on geographical transformation. People with middle-class to upper-class incomes are more likely to alter the design of their houses. The modification entails a shift from one-story to two-story housing for residential areas. The change in house design from traditional to modern settings has an impact on this transition as well. In addition, the evolution of space and buildings in Balinese ethnic houses is influenced by social standing as a community with a high level of economic development. The transformation of spatial planning and construction planning to reflect self-identity and the factor of space requirements on the growing number of residents of the house are both influenced by the effect of rising social and economic status (Hanan, 2018; Ibrahim et al., 2020; Mika, 2012; Vitasurya et al., 2019).

The indigenous population of Denpasar tends to experience the issue above with a house spatial structure based on the *Sanga Mandala* pattern. *Sanga mandala* is a residential plan made up of many building masses, such as *Bale Daja* (main building/bedroom for parents and daughters), *Bale Delod* (living room), *Bale Dangin* (building for ceremonies), and *Bale Dauh* (making for sons/living room), *Paon* (kitchen), *Jineng* (rice storage), and holy sites (Dwijendra, 2020; Dwijendra & Sueca, 2019; I. K. M. Wijaya, 2018, 2020b). The arrangement of building masses in a configuration of building mass patterns is located in the center of the plaza (*natah*) with an orientation toward *Kaja* (the primary exposure or toward Mount Agung) and *Kangin* (sunrise direction). Typically, a dualistic transformation pattern results from these processes. This duality focuses on how the homeowner community thinks while deciding to alter their houses' architectural design. Understanding the "*utama*" and "*nista*" values forms the foundation of the perspective of spatial and architectural plan alterations. Compared to their opposites, namely *teben* (low-value orientation), or profane or secular, aspects that have a *luan* orientation (high-

value orientation) and are associated with holiness and ritual tend to undergo minor alteration (I. K. M. Wijaya, 2020b). As in the phenomenon above, the building layout and spatial planning implementation changes following a dualism pattern with two opposing sides. Buildings with an *utama* or *Utamah* value in a *sanga mandala* spatial layout are spaces or buildings that have experienced significant transformation and tend to keep their spatial existence.

The research on spatial planning in Bali has tended to concentrate more on cosmological concerns (Adiputra et al., 2016; Candrawan, 2020; Dwijendra, 2010; Putra et al., 2020; Siwalatri et al., 2015). Cosmology is the basis for planning Balinese ethnic houses in Denpasar. Even though it becomes a thought when local wisdom is in the middle of current advances, studies of alternative viewpoints appear to have been disregarded.

This study investigates the idea of altering the spatial configuration of Balinese ethnic houses in light of current architectural, economic, and demographic trends. The end outcome of this research is an analysis of the phenomenon, with the mindset of this transformation serving as the study's theoretical framework. This study applies descriptive qualitative methodologies to the phenomena seen in the field, taking into account cultural knowledge and the mindset of the Denpasar population to interpret the wonders that make up the study's subject.

2. METHODS

This study used a qualitative descriptive methodology that emphasizes empirical observations. Researchers use in-depth observation and interview techniques as tools in sensual, emic, ethical, and logical, empirical studies on instances that have been selected through purposive sampling (Cresswell, 2015; Denzin & Lincoln, 2009; Hamzah, 2019; Johnson & Christensen, 2000; Marvasti, 2019; Muhadjir, 2000; Sugiyono, 2019). Four sub-districts of Denpasar—North Denpasar, South Denpasar, West Denpasar, and East Denpasar—are the research site (see Figure 1). Based on purposive sample principles, cases in the four sub-districts. The goal of this research

study is to find findings and conclusions that are rational and logical by emphasizing the concept of spatial treatment of Balinese ethnic dwellings in Denpasar using a normative and universal method, empirical data, and dialoguing with accepted conceptions.



Figure 1. Research Location in Denpasar
Source: Wijaya, 2022

Practical information gathered for this study through observation, a survey, and interviews are as follows:

- a. The observations to see changes in space in residential buildings. This knowledge is the foundation for comprehending the spatial setting tendencies in Balinese ethnic residences.
- b. An overview of the literature on Balinese Hindu culture, including traditional Balinese architecture and cultural conceptions and beliefs. These ideas aid in understanding rather than providing a mechanism for evaluating the confinement issue in residential design
- c. The survey to see the response to situations that have been developed and approved, notably Balinese ethnic dwellings. Recording (drawing) information on a predetermined case.
- d. Interviews with homeowners, both structured and unstructured, to learn about the origins and history of modifications to the design of Balinese ethnic houses.

The analytical approach utilized in this study progresses from the identification of empirical phenomena, which is explained below, to the stage of induction analysis:

- a. The spatial setting (zone) is analyzed in which Balinese ethnic houses. Drawings of the house arrangement and each building mass are used to identify the physical parts.
- b. They are identify the zoning system of Balinese ethnic residences, interpret the meaning of each space, and the ability to display these markers logically and rationally in the form of signs or forms. These notions demand both local and global interpretation techniques.
- c. Grouping spatial alterations in the design of Balinese ethnic houses that take the form of typological modifications
- d. Examining the ideas that the Balinese ethnic population in Denpasar has about altering their spatial arrangement

The outcomes of the analysis of spatial changes are then synthesized to provide interpretive conclusions that crystallize from the analysis's effects. The synthesis approach involves engaging in a conversation with these findings and theories or concepts of a universal character to align the conclusions of common knowledge of the context. Although not conclusive in determining the truth, these findings help expand this research's understanding of the Balinese ethnic community's decision to alter the design of their dwellings.

3. RESULT AND DISCUSSION

3.1 Alterations to Balinese Ethnic Houses' Floor Plans Based on the Residents' Comprehension

The design of the Balinese ethnic house in Bali's southern region follows the principles of the *sanga mandala*. The idea of a *sanga mandala* is a zoning scheme that divides a yard into nine zones based on the natural axis (*kangin-kauh*) and the ceremonial axis (*Kajakajakelod*). Each zone has a spatial hierarchy, with the most significant zone (*utamanUtamatama*) at the top and the least significant zone

(*nistaning nista*) at the bottom. Each area has a territory occupied by building masses, including holy places, *Bale Daja*, *Bale Dangin*, *Bale Dauh*, *Bale Delod*, Kitchen, and Barn (Dwijendra, 2008; I. K. M. Wijaya, 2021). The illustration below demonstrates the

organization of Balinese ethnic dwellings is still clearly discernible, in contrast to vernacular or traditional groups that inhabit rural areas with vast tracts of land and minimal functions. Pengotan Village, Penglipuran Village, and Tenganan Pegringsan Village

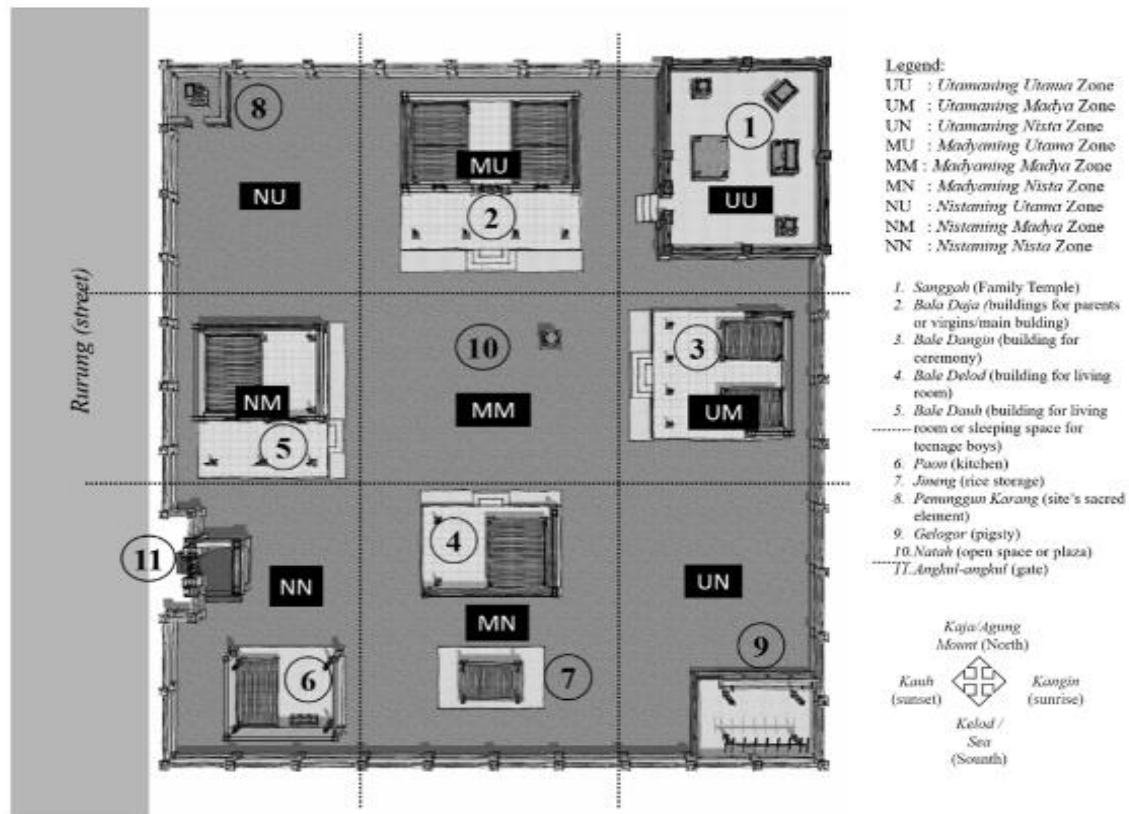


Figure 2. Concept of *Sanga Mandala*

sanga mandala concept.

Local laws in each Bali neighborhood typically govern the spatial arrangement of residential buildings based on understanding the orientation hierarchy between orientations of *utama* value (high or sacred) and those of *nista* value (low or profane). But the demand for space, the mindsets of the times, and the people that tend to lead to aspects of renewal and practicality in spatial planning gave birth to a dynamic attitude. Balinese ethnic dwellings in Denpasar, which have dynamics of increasing population expansion and constricting land availability, can be found to reflect these changes. This has turned into justification for the Balinese ethnic group in Denpasar to design a residential layout that suits their requirements. The spatial

are examples of vernacular villages in highland regions whose settlement patterns are still discernible following the orientation and zoning system. The road serves as the primary axis for the three communities' linear layout (Adiputra et al., 2000; Eriawati, 2018; Hanan & Winawangsari, 2020; Joniarta et al., 2019; Kumurur & Setia, 2011; Setiawan et al., 2020; I. K. M. Wijaya, 2020a; I. K. M. Wijaya & Dwijendra, 2021). The settlement's spatial configuration is unaffected by the increase in the number of families because plenty of land is still available, preventing changes during the construction phase.

In contrast to those who stay in the highlands, Denpasar's Balinese ethnic population has a different settlement pattern. The design of the

communities in Denpasar follows the *sanga mandala* concept, which divides the house into nine zones. Each zone has a hierarchical value and orientation, with *luan* and *teben* values that are interpreted in the directions of *kaja*, *Kangin*, *kauh*, and *kelod* (I. K. M. Wijaya, 2021; K. A. P. Wijaya & Wiranegara, 2020; Yulianasari et al., 2020). Changes in residential spatial design result from Denpasar's growth at an accelerating pace of population increase and the shrinking land supply. To accommodate the need for extra functions, these spatial modifications incorporate building mass and space. The Balinese ethnic group in Denpasar is aware of the importance of spatial hierarchy in their planning and is responsive to changes in spatial planning. According to the understanding of the relevant spatial hierarchy, zones that undergo modifications (addition of space) typically have low-value zones and directions (profane). Despite the zones or demands having considerable importance, they are nonetheless maintained for using sacred structures or structures for regional customs. According to research by Wijaya (2021), there is a dualism of direction that is of *utama* value and *nista* (low), which tends to experience dynamics of change, which is a zone of low weight, in the spatial arrangement of Balinese ethnic dwellings with a *sanga mandala* idea. The economic, behavioral, and environmental characteristics of metropolitan communities frequently impact the dynamics of these changes (Indriani, 2018; K. A. P. Wijaya & Wiranegara, 2020). A practical lifestyle and the presence of an urban environment influence how residential houses are laid out concerning their complexity of functions as a result of rising economic growth. The awareness of the hierarchical values of space, which generally regulate the spatial layout of Balinese ethnic houses, continues to affect changes in the spatial planning of the residences of the Balinese ethnic population in Denpasar. The Balinese ethnic group in Denpasar continues to value ritualistic practices; therefore, despite significant changes, places associated with ceremonial practices still appear to exist. In Denpasar, the Balinese ethnic population frequently relocates to low-value areas as opposed to areas that are

thought to have high values (*Kaja-kangin* directions).

Ten cases across four sub-districts in the Denpasar area illustrate the dynamics of spatial changes in Balinese ethnic dwellings. (see figure below)

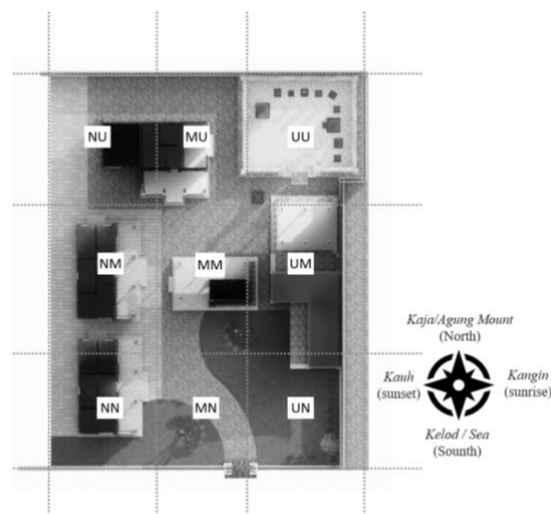


Figure 3. Zone of Change in Case 1

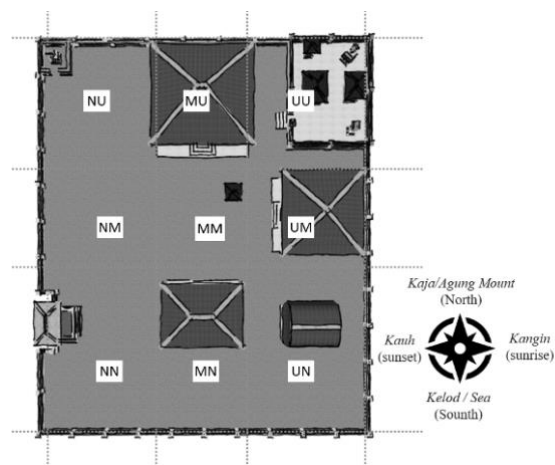


Figure 4. Zone of Change in Case 2

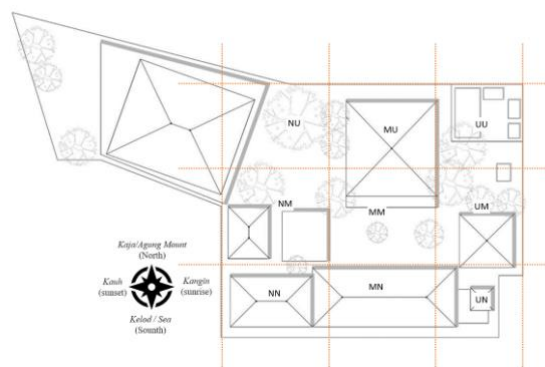


Figure 5. Zone of Change in Case 3

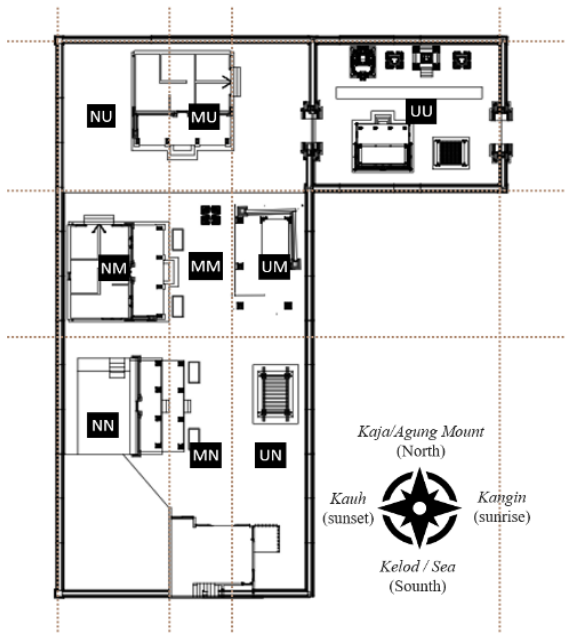


Figure 6. Zone of Change in Case 4



Figure 7. Zone of Change in Case 5

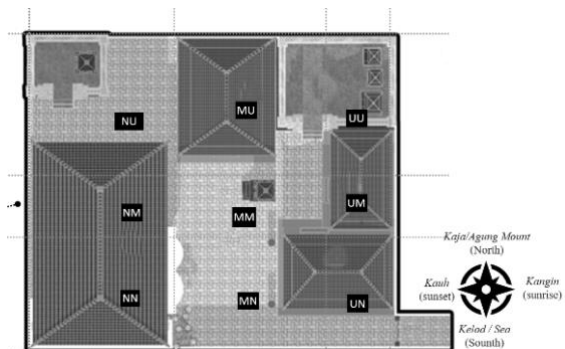


Figure 8. Zone of Change in Case 6

Figure 9. Zone of Change in Case 7

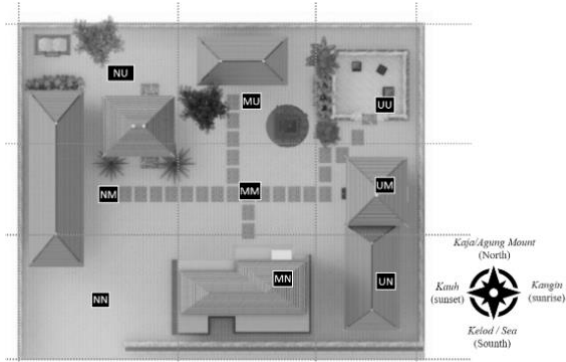


Figure 10. Zone of Change in Case 8

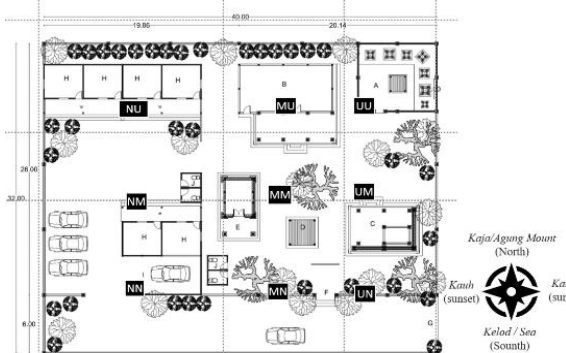


Figure 11. Zone of Change in Case 9

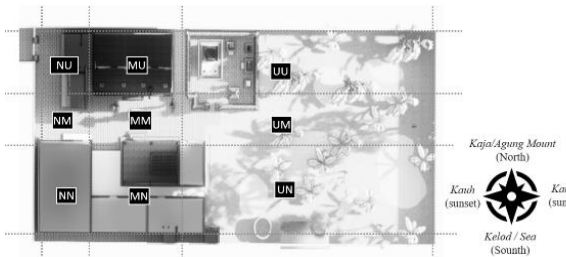
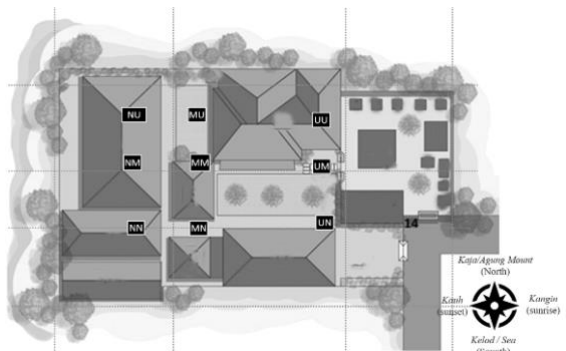


Figure 12. Zone of Change in Case 10



Figures 3 to 12 show that the building changes occurred in the building masses of *Bele Delod*, *Bale Dauh*, and the kitchen. These buildings are in the low-value zone (see Table 1). The figure above shows how the spatial configuration of Balinese ethnic dwelling, which often tends to be in low-value zones (*kelod* and *kauh*), has changed over time. Changes can form functional additions and space combinations that alter the building's shape and depart from the typical design of Balinese ethnic buildings (see Figure 13). The development of residential amenities and urban community lifestyles, which impact the creation of new house spaces, are responsible for these spatial alterations.

Table 1. The mass of the building changes and is constant

Building	Constant	Change
<i>Sanggah</i> (temple)	✓	
<i>Bale Daja</i>	✓	
<i>Bale Dangin</i>	✓	
<i>Bale Dauh</i>		✓
<i>Bale Delod</i>		✓
Kitchen		✓

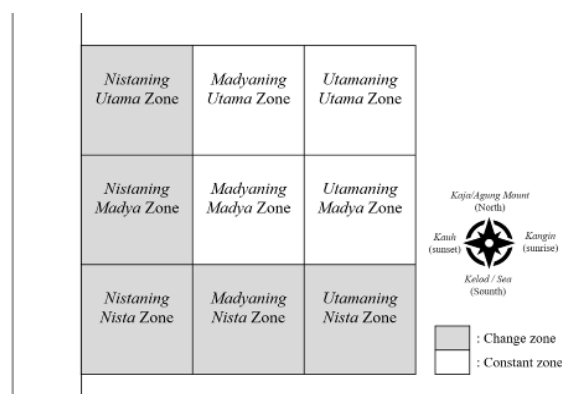


Figure 13. Constant and Changing Zone Graph

3.2 Typology of Modifications to Balinese Ethnic Residential Houses' Spatial Planning in Denpasar

A kind of adaptation that considers the idea of traditional Balinese architecture in the dynamics of its changes is the literacy knowledge of the spatial concept of Balinese ethnic dwellings in Denpasar in the face of spatial transformations. With the construction of new structures and the existing ones' subsequent horizontal and vertical expansion, zoning amendments frequently favor the *teben*

position and the *nista* zone. This alteration results in the following type of alteration:

a. Horizontal Typology

Changes in spatial planning with a vast land result in horizontal typology. For housing that still has a large amount of land, the availability of a new residential space is necessary before adding space or buildings by extending (connecting) the old building or constructing a new building on the available land. While the *luan* zone does not vary significantly, the construction of new buildings pays attention to the space hierarchy in the *teben* or *nista* (low value) zones. Similar to the expansion of space, the renovated buildings are *Bale Delod* and *Bale Dauh* structures situated in the *teben* zone. (see Figure 14)

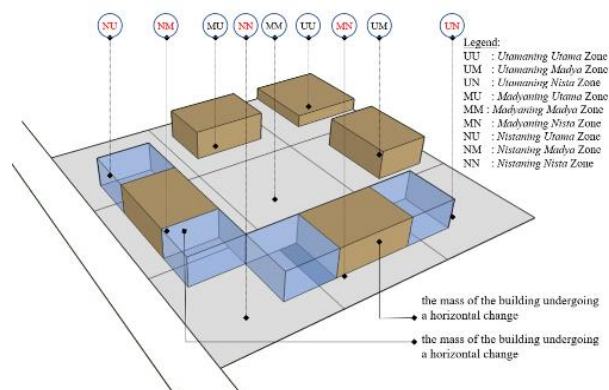


Figure 14. The Mass of The Building Undergoing a Horizontal Change

b. Vertical Typology

Abrupt direction changes happen in residential neighborhoods with small areas. The one-story *bale daja*, and *bale dauh* structures have been transformed into two- or three-story systems. The development consists of expanding the top of the form. This is a spatial planning modification in response to changes in the houses of Denpasar-area Balinese dwellings. The physical design of Balinese ethnic houses continues to influence how the general public perceives space for religious ceremonial activities and customs. In the dynamics of change, it is essential to safeguard the presence of sacred sites like *Bale Daja* and *Bale Dangin*. This occurs in

the house where a *sangguh* or holy place is located (*sangguh utama*). The *sanga mandala* concept is rarely used for new construction as a method of failing to establish residential zones. This demonstrates that the main house, not the

ethnic residences divide the space hierarchy based on the *luan* and *teben* directions using traditional Balinese architecture permeating Hindu-Balinese philosophy as a guideline. To create a distinct hierarchical order in the spatial arrangement of the house, the concept

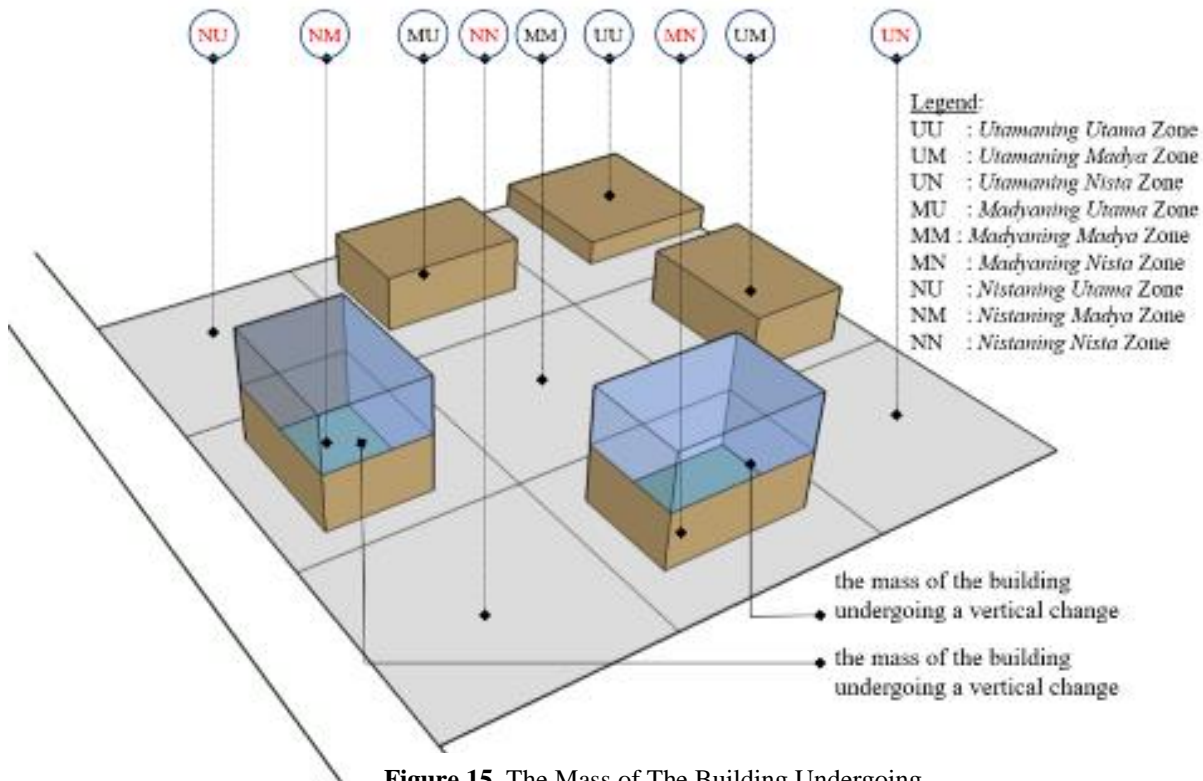


Figure 15. The Mass of The Building Undergoing a Vertical Change

place inhabited outside the main house, is where a domestic spatial plan with a *sanga mandala* notion occurs. (see Figure 15)

3.3 Balinese Ethnic Communities in Denpasar's Conception of Literacy and Adaptation in Residential Spatial Planning

The Balinese ethnic community's knowledge of the principles of Hindu religious teachings, which place rituals or things related to traditions in a higher zoning system, often shapes the physical arrangement of their houses. Determining the location of places with a primary function (high) requires understanding the orientation of *Kaja* and *Kangin* as upstream directions (high value). Understanding this idea has become essential to Balinese ethnic group life, founded on Balinese Hindu religious teachings. Balinese

of *luan* and *teben* is interpreted as a dual direction that must be maintained. While the focus of *teben* is connected to the law of *kelod* and *kauh*, the order of *luan* is equal to that *kaja* and *kangin*.

The Balinese ethnic group still understands literacy in executing the requirement for complicated places in Denpasar's development and modernity. The Balinese ethnic community understands the spatial layout of Balinese ethnic residences through an understanding of the direction and hierarchy of space, so the idea of using this understanding as a reference in the initial spatial planning and any changes is at the heart of the literacy in question. The ethnic community of the Balinese uses the existence of the nine hierarchies of space and the dualism of direction as a framework for analyzing change.

The *luan* direction and the *utama* zone are places for ritual and traditional activities, but the *teben* and *nista* zones are places for domestic service activities (secular or profane).

As a result of the demands for the function of dwelling in an ethnic Balinese house in Denpasar, adjustments in spatial design were made due to an understanding of literacy concepts in the direction of *luan-teben* and *utama-nista*. There must be enough land and structures to accommodate more family members living in one house. The order and areas of *teben* and *nista* are used when adding space or buildings to one yard. Different building forms are modified by adding more room or facilities, with Balinese ethnic architecture appearing as a result (traditional). Most Balinese buildings, the first square and one story have since evolved into structures with enormous proportions and multiple floors. This modification reflects the necessity for additional rooms or systems to house the growing number of family members.

4. CONCLUSION

The Balinese ethnic community in Denpasar conducts residential spatial planning based on the provisions of the *sanga mandala* concept as the knowledge that has been developing amid the Balinese ethnic community. Perceptions in understanding changes in the spatial layout of residential houses and the dynamics of their differences are carried out contextually through literacy of the meaning of the concepts of *luan – teben* and *utama – nista*; adapting to these changes which result in a typology of spatial differences in the horizontal direction for yards with large areas of land and the vertical focus for narrow yards.

This contextual perception has an understanding by the Balinese ethnic community in Denpasar, namely understanding the spatial concept of *sanga mandala* on the value of spatial orientation and hierarchy, as well as the urgency of space; and adjusting the space requirements based on the orientation value and the order of the area. So contextual values become the mindset and perception of the Balinese ethnic community in Denpasar in facing the demands of changing

space which is increasingly complex in their needs. The zones that have the value of *teben* and *nista* are areas of tolerance in adding length and changing the shape of the building. In contrast, the zones with the value of *luan* and *utama* of existence are maintained as core and substantive spaces.

AUTHOR CONTRIBUTION

Three architecture lecturers at Warmadewa University and another author from the Department of Architecture & Multimedia Gallaecia, Portucalense University, Portugal, each contributed to the preparation of this article.

As the first author, I Kadek Merta Wijaya (IKMW) played a role in building ideas on research topics and the substance of studies; Mariana Correia (MC), as the second author, gave a contribution to a study of research methods; I Nyoman Warnata (INW), as the third author, gave direction at the preparation of the topic discussion stage; and as the fourth author, I Ketut Sugihantara (IKS), gave the literature review. The researcher would like to thank the Research Institute of Warmadewa University for providing the funding grant for this study. The Warmadewa University architecture students helped with field data collection. The informants provided information and were permitted to conduct observations beginning with the initial identification stage and continuing through the analysis stage.

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