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The Fusion of Balinese Architecture & Modern Architecture in Tropical House Villas

Pierre Senjaya[1*], Uras Siahaan[2], Sri Pare Eni[3], Margareta Maria Sudarwani[4]
Universitas Kristen Indonesia
Corresponding Author: Pierre Senjaya pierresenjaya@gmail.com

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ABSTRACT

This study explores the fusion of Balinese and modern architecture in tropical villa design, addressing the growing demand for comfortable, aesthetic, and sustainable living. Balinese architecture, rooted in cultural and spiritual principles such as Tri Hita Karana, Tri Mandala, and Sanga Mandala, emphasizes harmony with nature. In contrast, modern architecture contributes functional efficiency, minimalism, and the use of contemporary materials and technology. Using a qualitative case study of villas in Bali, the research examines the characteristics, challenges, and impacts of combining these styles. The findings reveal that this integration can create tropical homes that are both comfortable and culturally expressive. The study offers recommendations for balancing cultural values and modern innovation in future tropical villa design.

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INTRODUCTION

Architecture is one of the cultural expressions that continuously evolves along with the changes of time. Each region has architectural characteristics that reflect its cultural values, environment, and the needs of its community. One architectural style with a strong identity is Balinese architecture. Balinese architecture is known for its use of natural materials, open spatial concepts, and the Tri Hita Karana philosophy, which emphasizes the balance between humans, nature, and the divine. This principle is reflected in building designs that harmonize with the surrounding environment, the use of distinctive ornaments, and spatial layouts that follow customary and religious rules.

As time progresses and the demand for comfortable and functional housing increases, modern architecture has begun to influence traditional building designs. Modern architecture emphasizes spatial efficiency, innovative materials, and a minimalist concept that presents a simple yet elegant impression. The use of new technologies and materials such as glass, concrete, and steel has also become a hallmark of the modern approach. In recent decades, the trend of blending traditional and modern architecture has been growing. One clear example of this trend is the concept of the tropical house, a residential style that adapts tropical elements with modern touches. The tropical house villa features open designs, the use of natural ventilation, and the integration of indoor and outdoor spaces to ensure comfort in a tropical climate. This aligns with the principles of Balinese architecture, which also emphasizes a harmonious relationship with the environment.

In Bali, the fusion of Balinese and modern architecture in villa design is becoming increasingly popular, especially in the hospitality and tourism industries. Both domestic and international tourists tend to seek lodging experiences that offer modern comfort without losing the Balinese atmosphere. As a result, many property developers have begun adopting the tropical house villa concept with a hybrid approach between Balinese and modern architecture.

However, despite the many advantages of this fusion, there are also several challenges in combining two architectural approaches with differing design principles. One of the main challenges is preserving the essence and identity of Balinese architecture within modern designs without diminishing the cultural values embedded in it. Moreover, the use of modern materials and technologies must be adapted to remain environmentally compatible and to support the sustainability of local architecture.

Given this background, this study aims to further explore how the fusion of Balinese and modern architecture is applied to tropical house villas, and how cultural, functional, and aesthetic aspects can be maintained within a more contemporary design approach (Sudiarta, 2019). What are the key characteristics of Balinese and modern architecture as applied to tropical house villas? And what are the principles of integrating Balinese and modern architecture in villa tropical house design to ensure the preservation of Balinese cultural values?

LITERATURE REVIEW

Balinese Architecture

Balinese architecture is a form of spatial expression that serves as the living environment for the Balinese people, passed down through generations with the application of various rules that have evolved since ancient times. Balinese architecture is a type of vernacular architecture, known for its distinctive use of natural local materials in the construction of buildings, such as thatched roofs, bamboo, wood, stone, brick, and others (Wicaksana, 2020). The design of Balinese architecture is heavily influenced by the beliefs and culture of the Balinese people, particularly their adherence to Balinese Hindu traditions. This influence stems from the deep faith and devotion of the Balinese community to their culture and religious practices in their daily lives. Therefore, when designing Balinese architecture, it is essential first to recognize and understand the concepts and essential meanings behind Balinese architecture to truly embody its values correctly and authentically. Balinese architecture is deeply connected to the philosophies contained within its design processes, which serve as expressions of cultural values and meanings that represent the Balinese people's relationship with their living spaces. Among the key philosophies in Balinese architecture are:

a. The Tri Hita Karana philosophy, which is interpreted as the three causes of well-being in life. This philosophy emphasizes the harmonious relationship between humans and God (Parhyangan), humans and the natural environment (Palemahan), and humans with one another (Pawongan). The elements contained within Tri Hita Karana include Sanghyang Jagatkarana (the divine cause of the universe), Bhuana (the world or environment), and Manusia (humankind).

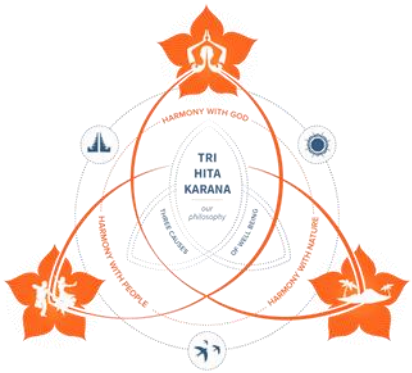

Figure 1. History and Meaning of Tri Hita Karana in Bali
Egod.eu,2021

b. The Tri Mandala philosophy is a spatial regulation concept that divides space into zones specifically, a conception of three areas that serve as a guideline for zoning based on levels of sanctity. These three areas or levels consist of:
    1) Nista Mandala (jaba sisi), which refers to the outermost area and is considered the least sacred zone.
    2) Madya Mandala (jaba tengah), which is the intermediate or transitional area, possessing a moderate level of sanctity.

3) Utama Mandala (jeroan), which is the innermost area and regarded as the most sacred zone.

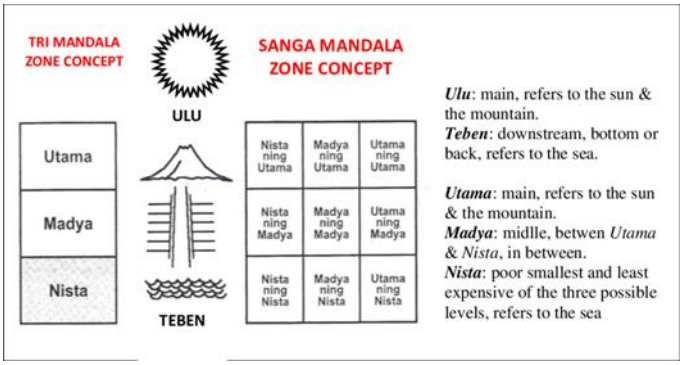

Figure 2. History and Meaning of Tri Hita Karana in Bali
Egod.eu,2021

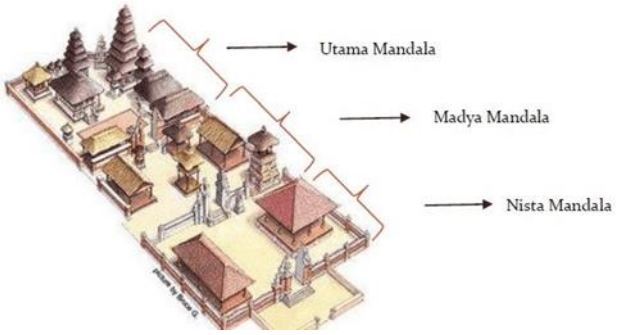

Figure 3. Mutiara, H. (2015). Correct Structure of a Temple
http://hindualukta.blogspot.com

c. The Sanga Mandala philosophy is a spatial and zoning regulation based on direction, rooted in the Kaja–Kelod (mountain–sea) and Kangin–Kauh (sunrise–sunset) concepts. These directional concepts represent sacred and profane orientations in Balinese cultural beliefs. Each pair carries sacred significance, forming two imaginary axes: the Kangin–Kauh ritual orientation axis (East–West) and the Kaja–Kelod natural orientation axis, which varies depending on the region in Bali.

The Sanga Mandala concept divides space into nine zones based on their levels of sacredness and profanity. This concept includes a central open area called the Natah. Along the Kangin–Kauh axis, space is divided into three zones: Utama (sacred), Madya, and Nista (profane). The same division applies to the Kaja–Kelod axis, resulting in a grid of nine zones, each holding its own degree of sanctity or profaneness.

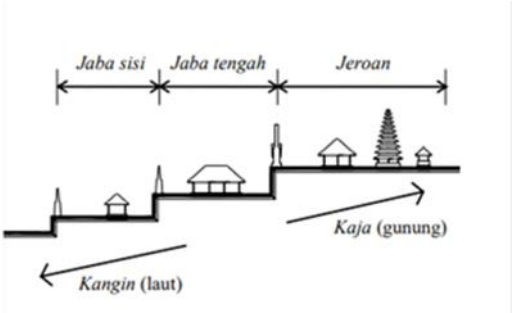

Figure 4. Temple Section Oriented Along Kaja-Kelod Axis
Sources Analisiss, 2012

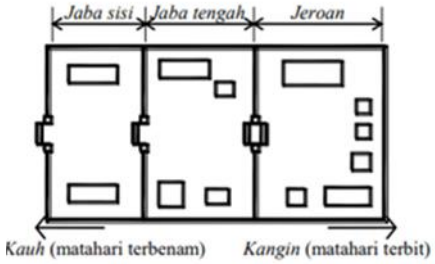

Figure 5. Temple Section Oriented Along Kaja-Kelod Axis
Sources Analisiss, 2012

d. The Tri Angga philosophy is a conceptual framework that governs the hierarchy among different realms of nature. It refers to the hierarchical structure of the microcosm, the middle realm, and the macrocosm. Tri Angga is closely related to Tri Loka, and it emphasizes three physical body values: Utama Angga (the upper/sacred part), Madya Angga (the middle part), and Nista Angga (the lower/profane part). Based on the vertically oriented Tri Loka, the Bhuwana Agung (macrocosm or universe) is divided into: Swah Loka (Realm of the Gods) – the highest and most sacred realm. Bwah Loka (Realm of Humans) – the middle realm with moderate sacred value. Bhur Loka (Realm of Animals and Evil Spirits) – the lowest and most impure realm. Tri Angga and Tri Loka apply both to the Bhuwana Alit (microcosm) and Bhuwana Agung (macrocosm), meaning they are relevant from the individual human scale to the broader geographical scale. In the earthly context: Mountains are considered Utama (sacred), Plains are Madya (intermediate), Oceans are Nista (profane or impure).
e. The Asta Kosala Kosali philosophy represents the traditional Balinese architectural knowledge concerning the arrangement of land for residential and sacred buildings. According to this concept, the layout of buildings is guided by the human body's anatomy, specifically that of the owner or occupant, forming a human-centric spatial design approach.

f. The Arga Segara philosophy explains the sacred orientation axis between Arga (mountain or kaja) and Segara (sea or kelod). Mountains are viewed as Parahyangan, the dwelling place of the gods (Hyang), the plains are seen as the realm of humans, and the sea is considered the realm of sea monsters and malevolent spirits.

Distinctive characteristics of Balinese architecture include:

a. Spatial Zoning: The natah concept—an open courtyard at the center of a building complex that functions as the main activity space.
b. Natural Materials: Use of natural stone, teak wood, bamboo, and thatch to create a harmonious and organic atmosphere.
c. Meru and Limasan Roofs: Multi-tiered meru roofs for sacred buildings, and limasan (pyramidal) roofs for residential houses.
d. Ornaments and Carvings: Decorative elements that reflect Balinese spiritual values and aesthetics.
e. Open Space Design: A semi-open architectural layout that allows for natural ventilation and optimal daylight.

Modern Architecture

Modern architecture developed in the early 20th century, emphasizing the principles of functionality, simplicity, and spatial efficiency (Wijaya, 2019). Several key principles of modern architecture relevant to this study include:

a. Form Follows Function:
The shape of a building should be determined by its intended function.

Figure 6. Rakta, S. (2025). Geometric architectural form by Rakta Studio
https://www.arsitag.com

b. Minimalism:
Minimal use of decorative elements to create a clean and simple impression.

Figure 7. TonTon, S. (2025). Modern Minimalist Architecture Features Minimal Ornamentation
https://www.arsitag.com

c. Innovative Materials:
The use of materials such as concrete, glass, and steel to create strong and efficient structures.

Figure 8. TonTon, S. (2025). Modern Minimalist Architecture Features Minimal Ornamentation
https://www.arsitag.com

d. Technology Integration:
The application of modern technology in lighting, ventilation, and smart building systems.
e. Open-plan:
A spatial design concept that eliminates dividing walls between rooms, creating an open and continuous layout.

Figure 9. TonTon, S. (2025). Modern Minimalist Architecture Features Minimal Ornamentation
https://www.arsitag.com

f. Energy Efficiency:
The use of eco-friendly materials and designs to reduce energy consumption.

The Integration of Balinese and Modern Architecture

In the effort to merge Balinese and modern architecture, several design principles are applied, including: adaptation of traditional ornaments into simplified forms Balinese ornaments are retained but in a minimalist style; the use of local materials in modern structures concrete and glass are combined with wood and natural stone; natural lighting and ventilation merging the concept of natah within a modern spatial layout and flexible zoning; and the use of open-space concepts to create continuity between interior and exterior spaces (Wardhana, 2017).

Tropical House Concept

The tropical house concept refers to house designs adapted to tropical climates to create thermal comfort. It is also defined as a house design that responds to tropical climate conditions to enhance thermal comfort (Rapoport, 1969). The main principles of tropical house design include: Natural ventilation, with large openings to improve air circulation; Sun protection, using wide roofs, overhangs, and vegetation to reduce heat gain; Local materials, such as wood, stone, and bamboo that are well-suited to tropical climates; Indoor-outdoor transition, with semi-open spaces that connect the interior and exterior (Kaplan, 1987).

Previous Studies

Previous research has extensively explored the integration of traditional and modern architecture. Several relevant studies include:

a. A study by Sudiarta (2019) on the Adaptation of Balinese Architecture in Contemporary Design, which examines how Balinese architectural elements are applied in modern building designs. The findings show that natural materials and spatial layouts based on the Tri Hita Karana philosophy can still be preserved in modern design.
b. A study by Putra (2020) on the Application of the Tropical House Concept in Modern Villas in Bali, which found that villas using the tropical house concept provide better thermal comfort than conventional designs. The key factors influencing comfort were air circulation and the use of vegetation as a natural cooling element.
c. A study by Hidayat (2021) on the Integration of Traditional and Modern Architecture in Tourism Buildings, which analyzed how traditional design can be implemented in modern commercial buildings without losing cultural identity. The recommendation was to adapt traditional elements into simpler and more functional forms.
d. A study by Susanti (2022) on the Sustainability of Balinese Architecture in Modern Property Development, which revealed that the use of environmentally friendly materials and modern technology can support the sustainability of Balinese architecture. The use of renewable energy and spatial efficiency were identified as key factors in the development of Balinese architectural properties.

Based on these previous studies, this research aims to deepen the analysis of how the fusion of Balinese and modern architecture can be more effectively applied in tropical house villa designs, particularly in terms of sustainability, aesthetics, and occupant comfort.

METHODOLOGY

This research uses a qualitative approach with a case study method. The qualitative approach is chosen to gain an in-depth understanding of how the integration of Balinese and modern architecture is applied in tropical house villa designs. The case study method is used because this research focuses on an in-depth analysis of several relevant research objects to gain comprehensive insights.

Types of Data

This study uses two types of data: Primary data, obtained directly from the field through observation, interviews, and documentation of the research objects. Secondary data, gathered from written sources such as journals, books, research reports, and architectural documents related to the fusion of Balinese and modern architecture.

Data Sources

Primary sources include architects who design tropical house villas combining Balinese and modern architecture, villa owners or residents who have implemented this concept, and property developers engaged in the design and construction of tropical villas in Bali. Secondary sources include academic literature and publications related to Balinese architecture, modern architecture, and tropical house design; architectural project documents such as design drawings, case studies, and building regulations; and the interpretation of analytical results to address the research questions and formulate key research findings.

RESEARCH RESULT

Discussion will be conducted in several important aspects, including characteristics, challenges, impact on comfort, aesthetics, and environmental sustainability, as well as responses from occupants and developers to the applied design.

Characteristics and Challenges of Balinese and Modern Architecture

This study identifies that Balinese architecture is deeply rooted in cultural and spiritual philosophy, which is reflected in its design. Some distinct features of Balinese architecture, such as the use of natural materials (wood, bamboo, natural stone), open design with rich ornaments, and spatial arrangements harmonizing with the surrounding environment, remain integral in the design of the tropical house villa. The Tri Hita Karana philosophy, which emphasizes balance between humans, nature, and God, continues to be upheld in Balinese architecture applied to the tropical house villa (Wardana, 2019). On the other hand, modern architecture emphasizes functionality, simplicity, and the use of innovative materials like glass, concrete, and steel. The main characteristics of modern architecture include the reduction of excessive decorative elements, offering wider open spaces, and connecting interior and exterior spaces. The fusion of both creates a unique design, where modern minimalist principles collaborate with the rich cultural elements of Bali (Putra, 2020). For example, the use of modern geometric shapes combined with Balinese wood carvings or bamboo walls paired with efficient steel roofs. Although there is significant potential in blending these two architectural styles, the main challenge found is maintaining the authenticity and philosophy of Balinese architecture in modern designs that prioritize space efficiency and simplicity. Some of the main challenges identified in this study include:

Material Compatibility

Although many Balinese materials like bamboo and wood are used, modern materials like concrete and steel are often seen as conflicting with Bali's principle of harmony with nature. The challenge lies in how to use modern materials without sacrificing the aesthetic value and sustainability that are characteristic of Balinese architecture.

Integration of the Tri Hita Karana Philosophy

Translating the Tri Hita Karana philosophy into modern villa design is challenging. It involves connecting indoor and outdoor spaces, creating a balance between public and private areas, and ensuring that the design respects Bali's spiritual principles.

Environmental Impact

Balinese architecture is highly concerned with harmony with nature. However, modern architecture, with its larger and more rigid materials, may reduce the natural, environmentally friendly nature of the buildings. The challenge is to create designs that remain environmentally friendly and support sustainability.

Impact of the Fusion of Architecture on Comfort, Aesthetics, and Sustainability

In terms of comfort, the fusion offers significant benefits. The use of open designs, with gardens, natural ventilation, and large openings, allows for fresh air circulation and maximizes natural lighting. The semi-open space concept, characteristic of Bali, greatly supports good airflow, which is essential for comfort in tropical regions. From an aesthetic perspective, the combination of Balinese design with its traditional ornaments and modern minimalist forms creates an attractive atmosphere, supporting the research (Sari, 2021). The use of natural materials like bamboo, wood, and stone in both interior and exterior elements provides a distinct Balinese natural ambiance, while the clean and simple modern structure creates an elegant contrast. In terms of sustainability, the tropical house villa design, which combines Balinese and modern architecture, has great potential in supporting sustainability principles. The use of environmentally friendly local materials, rainwater management, and the application of eco-friendly technologies such as solar panels and energy-efficient systems are sustainable practices that can maintain a balance between nature and development. For example, wide roofs reduce heat from the sun, minimizing the need for air conditioning.

Case Study Comparison

In this study, several tropical house villas that implement the fusion of Balinese and modern architecture were analyzed. The findings show that each villa has a slightly different design approach, depending on location, budget, and design goals. Some villas emphasize stronger Balinese elements, with more ornaments and wooden and bamboo structures, while others prioritize modern simplicity with minimal traditional touches. However, both demonstrate that this fusion can be successful if executed with careful attention to the balance between culture and functional needs.

DISCUSSION

This study finds that the fusion of Balinese architecture and modern architecture in the design of tropical house villas can create a dwelling that is aesthetic, functional, and sustainable. Balinese architecture offers cultural values, spirituality, and a connection to nature through concepts like Tri Hita Karana and the use of natural materials. On the other hand, modern architecture brings efficiency, simplicity, and the use of innovative technologies and materials. This fusion is evident in the use of modern forms combined with distinct Balinese elements, such as wood ornaments and open space structures. The main challenge in this integration is maintaining the essence of Balinese culture while meeting modern functional needs, including material selection and the application of sacred zoning.

From a comfort perspective, the open design supports natural ventilation and lighting. Aesthetics are created from the harmony of traditional elements and minimalist style. In terms of sustainability, the use of local materials and eco-friendly technologies such as solar panels and rainwater management provide essential solutions. Case studies show that variations in approach can be applied according to context, as long as the balance between cultural values and modern needs is thoroughly and contextually maintained.

CONCLUSIONS AND RECOMMENDATIONS

This study shows that the fusion of Balinese architecture and modern architecture in the design of tropical house villas is not only possible but also beneficial in creating a harmonious, functional, and sustainable living environment. The key to success lies in preserving the cultural values of Balinese architecture while adapting modern design principles that meet the demands of contemporary living. The results indicate that careful attention to material selection, spatial organization, and environmental sustainability can create a villa design that is both aesthetic and comfortable for its occupants. This supports the findings of Setiawan (2018), who stated, "The main challenge in this integration is maintaining the essence of Balinese culture while meeting modern functional needs."

Based on the findings of this study, several recommendations can be made:

1. Design Adaptation:
   Architects should continue to explore ways to integrate the philosophy of Tri Hita Karana and the functional aspects of modern design in villa projects. This includes the use of appropriate natural materials and maximizing natural lighting and ventilation to enhance comfort and reduce energy consumption.
2. Cultural Preservation:
   Developers and architects must ensure that the cultural identity of Balinese architecture is maintained in modern designs, particularly in terms of ornaments, spatial arrangements, and the relationship with nature.

3. Focus on Sustainability:
   Future villa designs should place greater emphasis on sustainability by integrating eco-friendly materials, energy efficiency systems, and water conservation practices, aligning with both Balinese and modern architectural principles.

ADVANCED RESEARCH

Still conducting further research to find out more about The Fusion of Balinese Architecture & Modern Architecture in Tropical House Villas.

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