

Modern Tropical Architecture Style on Uluwatu House, Indonesia

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ABSTRACT

Climatic conditions on a land affect the design of the building. Indonesia, which has a tropical rainforest climate, is characterized by high temperatures, high rainfall and humidity. As a result, tropical architecture has become one of the distinctive architectural styles of Indonesia. Indonesia is also rich in tourist destinations. The tourism industry is supported by accommodation, one of which is lodging. Lodging in Indonesia, especially villas apply a distinctive architectural style as an attraction. The concept of tropical modern architecture has not been specifically discussed for its application. So this study aims to examine the application of a tropical modern architectural style in one of the villas in Indonesia, namely Uluwatu House which was designed by SAOTA. The nature of the research is descriptive with data obtained through literature study. Tropical modern applications at Uluwatu House occur in the form and mass of the building, facade, and materials. The shape and mass of the Uluwatu building pays great attention to function. The facade maximizes openings to allow natural light to enter the building. The opening that dominates the facade is covered with glass so that it is still consistent with the modern architectural style. The materials that are widely used in Uluwatu House are natural materials that are responsive to the climate.

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1. Introduction

Architectural design needs to pay attention to the climatic conditions of the land. Based on the zone map, the climate is divided into tropical climates, temperate climates, cold climates, and polar climates [1]. The tropical climate occurs in the area around the equator, precisely 23°27' north latitude and south latitude. The tropical climate is divided into 3, namely tropical rainforest, tropical monsoon, and tropical savanna [1]. South-east Asia, Africa, and South America are countries with a tropical rainforest climate [1]. This climate is characterized by high rainfall, high air temperature, high humidity, wind speed, and other influences.

Different climatic conditions in various parts of the world require a response from architects as building designers. The term tropical architecture developed since the colonial period, around the 1950s [2][3][4]. Britain as a commonwealth country expanded its countries including countries located on the equator [2][3]. Architects encountered problems in designing buildings in the British Commonwealth, which has a tropical climate. The Netherlands, which is located in the same

climate zone as Britain, encountered the same problem during the colonial period in Indonesia. It was not after several years that the Netherlands was able to adapt its building to the tropical climate in Indonesia. The main problem in building in a country with a different climate from the country of origin of the architects is the availability of materials and craftsmanship [2]. Karyono [6] emphasized that one of the strong characteristics of tropical architecture is the use of materials that are strong against climatic conditions, as well as showing the special character of local and low impact materials.

Tropical architecture is a development of colonial architecture [3] or traditional architecture [5]. Colonial architecture is an architecture that developed during the expansion of the Netherlands. The challenge of designing in a foreign climate makes the concept of tropical architecture develop as a separate topic in the realm of professions and education [2][3][4]. Meanwhile, local people see that the emergence of pure tropical architecture is an architectural response in a tropical climate. While the traditional building design itself has been able to respond to tropical

climate conditions. Hence the view that tropical architecture is an adaptation of traditional architecture. Nadiar and Pattisinai [5] stated that design and construction that responds to the local climate and is able to adapt to modern trends is the broadest definition of modern architecture. Tropical modern architecture tries to perfect tropical traditional architecture in response to heat that can no longer be handled by the use of air conditioning and seeks to maximize passive design [5].

Indonesia is an archipelagic country that has a variety of tourism and culture. One of the impacts of tourism development is the emergence of various villas. Villas provide and offer a place to stay by providing beautiful views and providing a local atmosphere or unique atmosphere. To get a local atmosphere, some inns are designed using local materials or with an architectural style that represents the local atmosphere. One of the architectural styles applied to lodging in Indonesia is the tropical architectural style.

The discussion of the concept of tropical modern architecture is very interesting to do because the application design has not been discussed too much. Most studies associate tropical architecture with building thermal comfort [5][7][8]. This study aims to formulate a tropical modern architectural style and see its application to local buildings. The local building that is the object of research is a vacation house. Of all the villas in Indonesia, Uluwatu House Villa is considered quite close to the tropical modern architectural style.

2. Material and Methods

To assess the application of a tropical modern architectural style at Uluwatu House Villa, it is necessary to formulate an application or characteristic of a tropical modern architectural style. The formulation of the characteristics of tropical modern architecture is carried out by describing the definition of modern architecture and the definition of tropical architecture.

This research is descriptive. Data obtained through literature studies, both data regarding modern tropical architectural styles and data from Uluwatu House Villa. The analysis step is preceded by the formulation of the characteristics of tropical modern architecture. The next stage of analysis is to see these characteristics which are applied to the design of Uluwatu House Villa, Indonesia. The results of this study are the forms of application of tropical modern architectural designs at Uluwatu House Villa.

2.1. Modern Tropical Architecture Style

Banham [10] emphasizes that the important points of modern architecture are simplicity of design and forms that match the function of the space or building. This definition makes the modern architectural style the most popular and widely used architectural style.

Nadiar and Pattisinai [5] distinguish traditional tropical architecture from modern tropical architecture. Traditional tropical architecture uses local materials and passive designs to create thermal comfort for building users. Meanwhile, modern tropical architecture is a design trend that developed after modern minimalism which tries to respond to heat issues as well as aesthetics. It can be concluded that traditional modern architecture focuses on function, energy, and aesthetics, while modern architecture only focuses on function [5]. Nugroho [8] describes the points of tropical local architectural design:

1. Use of light construction, especially wood and natural materials that have low thermal capacity. Natural materials are ideal for achieving thermal comfort for building users
2. The design of the building ensures that the air flow through the building is not significantly reduced
3. Roof area has sufficient ventilation
4. Coconut trees and other tall trees provide shade and do not block the flow of air at home scale
5. The wide walkway and minimally exposed wall area provide good shading

Meanwhile, Nadiar and Pattisinai [5] formulate the general characteristics of tropical architecture, namely:

1. The opening in the wall is made transparent and wide which aims to bring the user closer to nature
2. The roof has a wide eaves as a shadow
3. The material used is natural material

Aynsley [7] also formulated design guidelines for tropical climates, including:

1. Allowing air currents or wind to pass through the building and its surroundings to cool the temperature around and inside the building.
2. Provides shading to protect users from radiation
3. Use sunshades or vegetation and light reflecting surfaces with high emissivity to create thermal comfort inside the building and outside.

While some of the characteristics of modern buildings include: the use of neutral building colors to make it look simple, symmetrical line elements in mass and facade compositions, minimal ornamentation, material honesty, and many openings. Based on the explanations above, it can be concluded that the

characteristics of tropical modern architecture are:

1. Building shape and mass according to function, prioritizing square shape because it is the most effective form of space
2. Drains as shading and avoids rain
3. Wide or multiple openings for ventilation
4. Use of sunshade to reduce light radiation received by the building
5. Use of low impact materials
6. The use of glass to give a modern impression as well as closing the opening

2.2. Villa Building

The data needed in addition to the characteristics of tropical modern architecture is the design of Uluwatu House Villa. Harisdani and Kartika [9] examined tropical architecture in the convention hall. The discussion materials are:

1. Exterior
2. Building Form and Massing
3. Interiors
4. Structure and Utility

This research requires slightly different data from the research above. Based on the description of the characteristics of tropical modern architecture, the data needed for Uluwatu House Villa are:

1. Building Form and Massing
2. Building Facade
3. Building Materials

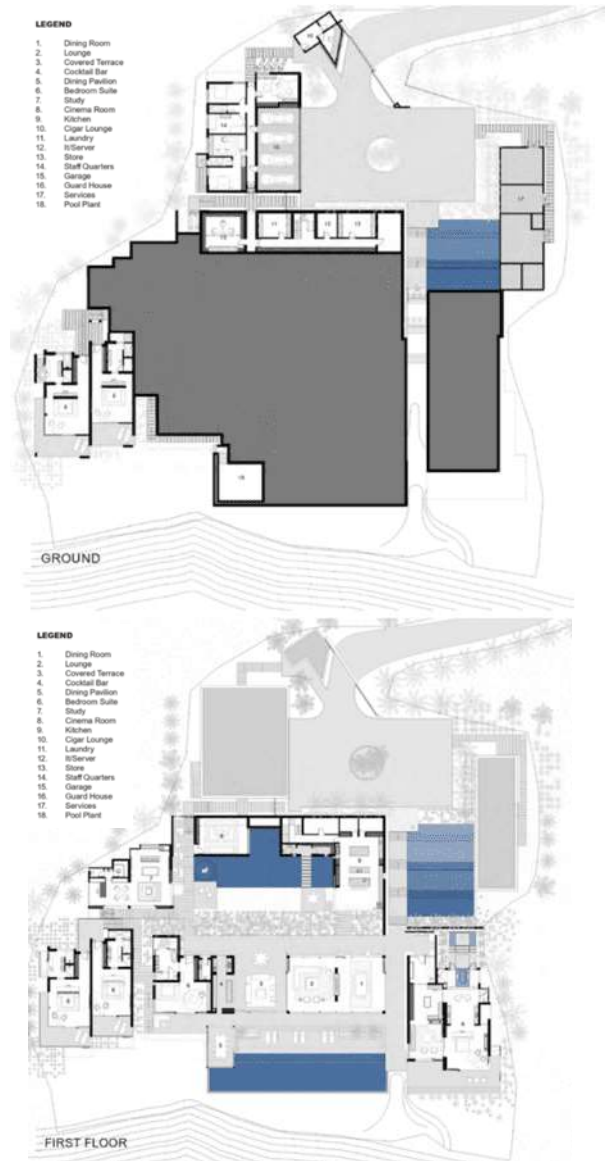


Source: (designverse.com.cn, 2022)
Figure 1: Uluwatu House

3. Results and Discussions

SAOTA design Uluwatu House inspired by an iconic surfing destination in Uluwatu, Bali This

villa uses local materials that are in harmony with the surrounding environment.



Source: (archdaily.com, 2022)
Figure 2: Uluwatu House Siteplan and First-floor plan

This villa consists of two floors with a mass of buildings spaced apart. On the first floor, it is facilitated with a parking area, lobby, laundry area, warehouse, and staff room. On the second floor it is facilitated with a dining area, living room, bedroom suites, kitchen, cinema room, cocktail bar, cigar lounge, and swimming pool. The design concept of this villa unites the indoor space with the outdoor space, which can be seen in the use of materials, namely concrete, wood and glass. The design of the yard, garden and terrace is also equipped with neat and natural structured vegetation.

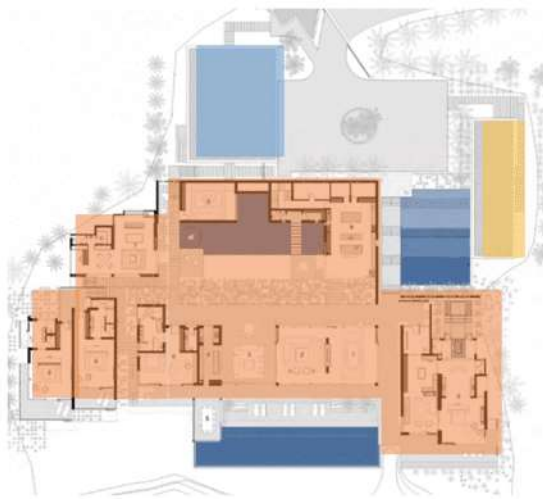
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This villa has one main door into the building which has direct access to the lounge, dining room and terrace. In all parts of this house using local concrete and stone textures that are typical of the surrounding environment.

The orientation of the mass of this building leads to the east and west, where the eastern part directly faces the sea. The main entrance courtyard is lined with trees with a large staircase that sits above a flowing water feature.

Uluwatu house is located on the peninsula hill, Bali Indonesia. Uluwatu house is a villa designed with a tropical modern architectural concept. This villa has an area of about 14 hectares surrounded by hills. This area also has direct access to Bali's Uluwatu beach.

3.1. Building Form and Massing



Source: (Author, 2022)
Figure 3: Zoning of Uluwatu House

On the floor plan of Uluwatu House Villa, the zoning division is carried out, namely:

- Orange color as a private zone: bedroom area, living room, private pool, lounge, and cinema room
- Blue color as public zone: parking area and lobby
- Yellow color as service zone

As we can see, every spaces serve its purpose or function. Non-colored area are terrace or circulation. For leisurely function, spacious room are needed, but not necessarily waste any area for undefined spaces.

One of the principles of tropical modern architecture is the shape of the building pattern which is based on a rectangular shape, as follows:

- Red color as the main building which has one basement and one ground floor. This area includes a living room, family room, bedroom, laundry room and other supporting facilities.
- Yellow color as a supporting building and parking area.
- In addition, the basic pattern of this villa building is rectangular and follows the shape of its function.



Source: (Author, 2022)
Figure 4: Uluwatu House Form and Massing

The use of the trellis in this villa building has an area as wide as the terrace, thereby reducing the tampias of water when it rains and protecting the walls of the building from the heat of the sun.

3.2. Building Facade



Source: (Author, 2022)
Figure 5: Uluwatu House Facade

The concept of tropical modern architecture, one of the principles is the number of openings and ventilation in the building so as to make it easy for air to enter and exit optimally.

The use of sun shading on the facade of this villa building is used to minimize incoming light, because the orientation of this building faces west so that it requires the use of sun shading.



Source: (Author, 2022)
Figure 6: Uluwatu House Sunshade

3.3. Building Material

One of the principles of the concept of tropical modern architecture is the use of materials. The facade of this villa uses low impact wood materials. But the use of large glass on the facade also gives the impression of being open, warm and modern.



Source:
(Author, 2022)
Figure 7:
Uluwatu
House Material

The use of glass which is one of the principles of tropical modern architecture is found in the southern facade of the villa. The glass used is

used as a window and entrance to the backyard that dominates the front of the building.



Source: (Author, 2022)
Figure 8: Glass material on Uluwatu House

4. Conclusion

The characteristics of the tropical modern architectural style are inferred from the modern architectural style and the tropical architectural style. The concept of tropical architecture focuses on energy, function, and aesthetics. While the modern architectural style prioritizes function. The characteristics of tropical modern architecture include:

The shape and mass of the building is in accordance with the function of the building. The rectangle shape will often be encountered because this shape is the most effective form of space

1. The presence of eaves as shading and rain protection
2. The proportion of the opening in the wall is large enough to regulate airflow
3. Use of sunshade on the facade to reduce radiation or heat received by the building.
4. Use of low impact materials
5. The use of glass to give a modern impression on the building.

The tropical modern architectural style at Uluwatu House Villa, Indonesia can be seen through the mass and shape of the building, the facade, and the use of materials. The shape and mass of the Uluwatu House Villa building tends to be boxy and according to function, there are no areas that are not functioning. The eaves in the building are quite wide because they also function to cover the terraces and balconies. Large windows and entrances on the facade of the building are beneficial for maximum natural ventilation and lighting. Sunshade at Uluwatu House Villa serves to minimize radiation entering the building. The majority of villa materials use wood and use neutral colors. The wide openings in the walls of the building are covered with glass. So overall, Uluwatu House

Villa has implemented a tropical modern architectural style.

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