

Research Article

Analysis of the Structural Design of Betang Houses in Central Kalimantan for Cultural Heritage Preservation and Local Tourism Potential

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Abstract

This research investigates the structural design of Betang houses in Central Kalimantan and their potential for cultural heritage preservation and local tourism development. Betang houses, traditional dwellings of the Dayak Ngaju people, have become significant cultural landmarks with both historical and architectural value. This study applies qualitative research through field observations, interviews, and literature review to analyze the architectural elements and preservation strategies of Betang Toyoi in Tumbang Malahoi Village, Gunung Mas Regency. The results highlight the unique architectural features of the Betang, including its robust wooden pillars, intricate roof structure, and symbolic elements. Additionally, the study explores the potential of Betang houses to attract tourists, offering insights into the economic opportunities related to cultural heritage tourism. Despite the potential, the research indicates that suboptimal management and maintenance have hindered the full realization of Betang Toyoi's tourism potential. The study concludes by emphasizing the need for improved infrastructure, support from local government, and enhanced management strategies to optimize the economic and cultural contributions of the Betang houses. These findings underscore the importance of preserving traditional architecture as part of the region's cultural heritage and sustainable tourism development.

Keywords: Betang House, Cultural Heritage Preservation, Local Tourism



Development.

INTRODUCTION

Betang House is a traditional house in Kalimantan. "Betang" is the name of the traditional house of the Dayak Ngaju people, who live in Central Kalimantan. The Betang not only serves as a dwelling but also as a place for the Dayak community to engage in social activities, gather, and perform customary ceremonies and local cultural practices.

From a social perspective, Betang reflects the concept of community and togetherness in everyday life, particularly within the Dayak society. A Betang is not only inhabited by a single family but can consist of multiple households, making the Betang a community within itself. In the Betang, all families face life in a system that is organized through mutual agreements encapsulated in customary laws, which must be adhered to by all residents of the Betang.

In terms of architecture and civil engineering, the Betang is unique due to its distinctive shape, sturdy structure made from traditional building materials, and simple construction techniques, particularly in older Betang houses. These characteristics of Betang make it an interesting subject for architectural and historical studies. The study of Betang can also serve as an avenue for further exploration into how traditional architecture can provide solutions to contemporary challenges, especially regarding sustainable construction techniques.

Given these unique characteristics, the Betang has the potential to become a significant historical tourism object, contributing to cultural heritage tourism and offering a source of income for the local area through the tourism sector. The Betang Toyoi building in Tumbang Malahoi Village, Gunung Mas Regency was selected as the object of this research. The choice of Betang Toyoi is based on its distinctive characteristics and the relatively old age of the building.

Research Objectives

This study aims to:

- Analyze the structure of Betang houses.
- Analyze the potential for tourism and preservation strategies.

The objectives of the study are:

- To protect traditional and historical buildings.
- To increase public awareness of preserving traditional and historical buildings.
- To support the enhancement of local tourism potential.

Literature Review

According to Ariestadi, a building is a physical manifestation of construction work integrated with its location, whether above, below, or in water. Based on this, construction works on land or water can include roads, bridges, railways, airports, ports, buildings, dams, reservoirs, irrigation, and other infrastructure. Grigg emphasizes buildings as part of the physical infrastructure system needed to fulfill basic human needs, both socially and practically. Based on this, a building serves as infrastructure to meet human needs.

Marcus Pollio Vitruvius, a classical architecture maestro, defines a building (architecture) through three main principles: *Firmitas* (strength), *Venustas* (beauty),

and Utilitas (use/function). A building is not only about structure but also its beauty. Christopher Alexander in his work *A Pattern Language* (1977) discusses the structure of buildings, which consist of:

1. Upper Structure: Roof, roof frame, and upper structural elements.
2. Middle Structure: Walls, columns, and middle structural elements.
3. Lower Structure: Foundation, ground floor, and lower structural elements.

Each building consists of its structural elements, and these structural elements differ for each type of building, but the basic principles remain the same, comprising upper, middle, and lower structures. This classification is based on the location of the structural elements within the building. The structural element refers to the part that receives and resists weight. Therefore, the structure of a building is where the strength and sturdiness of the building lie.

Bernard Feilden defines a historic building as a structure that has architectural, aesthetic, historical, and social value that makes people want to learn about it. The principles of conserving historic buildings provide basic information for architects, engineers, and surveyors to solve architectural conservation problems in various global climates.

The Betang Toyoi House is a building that embodies the values described by Vitruvius: it is strong and beautiful, and according to Feilden, it is a historic building with architectural, aesthetic, historical, and social significance, making it a subject worth studying.

METHOD

This study uses a field observation method with a qualitative approach. Data are collected through observation, interviews, and literature review. Data analysis is conducted inductively, where specific data from the observations are processed directly.

Observations are made on-site, focusing on the physical form, materials, and physical elements attached to the Betang house. Detailed notes are taken during the observation process.

Interviews are conducted using an interview guide that has been prepared, containing the key issues to be studied. The method of interview used in this research is in-depth interviewing with informants, such as the village head and local community leaders, who have knowledge about the Toyoi building being studied. In-depth interviews are expected to gather data on the values and symbolic meanings of the form and elements of the Betang house.

The literature review serves to support the data obtained from observations and interviews. Secondary data, including demographic data, local socio-economic conditions, and culture, are collected from local government offices. Additionally, the literature review is conducted by reading various books and articles related to architecture and the Dayak community, which are relevant to this research.

Data Analysis

The inductive analysis technique is an approach that starts with specific data and then draws general conclusions. Inductive analysis helps to understand the phenomenon from the perspective of the data rather than from preconceived theories.

The data analysis follows these steps:

1. Data Transcription: Record all data (interviews, observations).
2. Coding: Assign codes to the data such as "building structure," "tourism potential."
3. Categorization: Group the codes into themes like "Structure," "Tourism Potential."
4. Pattern Identification: Find relationships between the groups.
5. Interpretation: Give meaning to the identified patterns.
6. Validation: Check the data again to ensure its accuracy.

RESULT AND DISCUSSION

Result

The Betang Toyoi House, also known as Betang Toyoi Malahoi, is a traditional house of the Dayak Ngaju tribe located in Tumbang Malahoi Village, Rungan District, Gunung Mas Regency, Central Kalimantan. This house is one of the cultural heritage sites that has preserved its authenticity and serves as both a cultural heritage site and a cultural tourism destination.



Front View of Betang Toyoi

Location and Historical Context:

Situated in the watershed area of the Manuhing River, Tumbang Malahoi Village, Rungan District, Gunung Mas Regency, Central Kalimantan. The Betang house was built around 1869. Betang Toyoi is rich with stories and traditions passed down through generations, making it one of the oldest Betang houses in the region.

Architecture and Structure:

Stilt Design: Built in a stilt design, the Betang house is elevated above the ground.

1. Lower Structure:

- **Foundation, Wooden Pillars:**

The wooden pillars, made from ulin wood (known as *tabalien* in Dayak Ngaju language), are large in size and directly planted into the ground. The height of the

pillars from the ground to the floor is between 2.2 and 2.7 meters for the main house. The diameter of the wooden pillars varies and is not uniform, ranging from 0.90 to 1 meter.

The ulin wood, commonly known as "ironwood" in Indonesia, is scientifically named *Eusideroxylon zwageri*. This wood is known for its strength and durability and has historically been used in building construction, including houses in Central Kalimantan. The use of ulin wood has long been an integral part of traditional architecture in the region.



Image of the Wooden Pillar Foundation of Betang Toyoi

2. Middle Structure:

The load of the building in the middle section of the Betang is primarily supported by columns. There are two large round columns with a diameter of 1 meter, while the columns on the walls are smaller, measuring 0.60 meters in diameter. The beams that distribute the load evenly across Betang Toyoi are also made from round ulin wood, with the lower part of the roof trusses using these round wooden beams. The middle section of the structure, however, features square-shaped beams.



Image of columns and beams on the wall

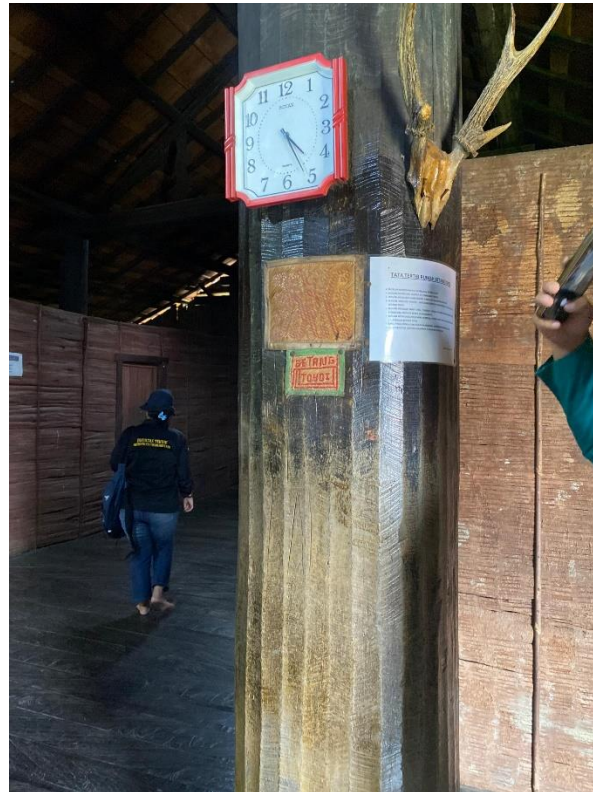


Image of columns and beams in the center of the room

Walls: The walls of the Betang Toyoi are unique in that they have two layers. The first layer is made of vertically arranged wooden planks, while the second layer is made of jelutung tree bark arranged horizontally (crosswise) and held together with rattan. The walls of the building not only serve as room dividers but also help distribute the load from the beams to the columns and then to the foundation.



Wall painting in the center of the room

3. Superstructure

The superstructure of the Betang Toyoi is a wooden truss.

Roof: Saddle-shaped, made of shingles (thinly sliced ironwood) tightly assembled. Above the main door is a carved sculpture.



Image: Superstructure of the Betang Toyoi, a wooden horse

Tourism Potential Analysis

- **Symbolism:** The structure of the pillars and walls of the Betang Toyoi has deep symbolic meaning, reflecting beliefs in divine nature, responsibility, and strength.
- **Social Function:** Traditionally, the Betang Toyoi served as a residence for many extended families within a single, elongated structure, reflecting communal living patterns and the spirit of mutual cooperation.
- **Tourist Destination:** Currently, the Betang Toyoi has become a leading tourist destination in Central Kalimantan. Visitors can stay (homestay) and experience firsthand the life and culture of the Dayak people of the past.
- **Ornaments:** The distinctive ornaments of the Ngaju Dayak people have spiritual meanings based on the Kaharingan Hindu belief and past family history.

The Betang Toyoi house is an important site for studying traditional Dayak architecture and their collective values. There is no specific data on the number of tourist visits to the Betang Toyoi in Tumbang Malahoi Village, Gunung Mas Regency, Central Kalimantan, from year to year. Based solely on interviews with the managers of the Betang Toyoi houses, tourists visit daily, but the numbers are small, with only one group per day, each consisting of 3 to 5 people. Based on the above assumptions, the estimated number of tourist visits to Betang Toyoi is:

Number of visits per month = 30 x 5 people = 150 people

Number of visits per year = 150 people x 12 months = 1,800 people per year

According to data from the Central Statistics Agency (BPS) of Gunung Mas Regency, sourced from the Gunung Mas Regency Culture and Tourism Office, there is no data on visits to Betang Toyoi. However, there is data on tourist visits to Gunung Mas Regency, with the latest data showing 25,843 people.

CONCLUSION

The structure of the Betang Toyoi is a frame structure. A frame structure in a building is a structural system consisting of linear elements (such as beams and columns) connected to form the building's framework. This structure serves to support building loads, such as gravity, wind, and earthquake loads, and distribute them to the foundation.

The Betang Toyoi has significant tourism potential as a tourist attraction that can generate regional revenue from tourist visits. Its history, unique shape and space, the robustness of its structure, and its social and traditional functions are all important factors. However, suboptimal management has resulted in suboptimal revenue support from this sector. Building maintenance and upkeep also need to be improved, and support from the local government is also essential.

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