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Tectonics, Structure And Floor Plan Of Taneyan Lanjhang Traditional Houses In Modern Madura Residential Houses

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ABSTRACT

Traditional houses are an important cultural asset in society. The Taneyan Lanjhang traditional house, a traditional house located in a certain area, has been the object of research in this study. This research aims to examine the tectonic and structural aspects of the Taneyan Lanjhang traditional house, including the geological characteristics that influenced its construction. The research method used in this study involves field surveys, primary and secondary data collection, as well as 3D rendering and qualitative descriptive explanations. Primary data was obtained through direct observation of the Taneyan Lanjhang traditional house, while secondary data was obtained through a study of related literature. Research shows that the Taneyan Lanjhang traditional house is supported by tectonic structures typical of the area. This structure plays an important role in the strength and stability of the traditional house. Some of the structural elements found include wooden columns, types of connections, and roof shapes.

Keyword: Taneyan Lanjhang, Structure, Tectonics, Joints, Roof shape

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Traditional houses are an important cultural asset in society. The Taneyan Lanjhang traditional house, a traditional house located in a certain area, has been the object of research in this study. This research aims to examine the tectonic and structural aspects of the Taneyan Lanjhang traditional house, including the geological characteristics that influenced its construction. The research method used in this study involves field surveys, primary and secondary data collection, as well as 3D rendering and qualitative descriptive explanations. Primary data was obtained through direct observation of the Taneyan Lanjhang traditional house, while secondary data was obtained through a study of related literature. Research shows that the Taneyan Lanjhang traditional house is supported by tectonic structures typical of the area. This structure plays an important role in the strength and stability of the traditional house. Some of the structural elements found include wooden columns, types of connections, and roof shapes.

Keyword: Taneyan Lanjhang, Struktur, Tektonika, Sambungan, Bentuk atap



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1. Introduction

Traditional houses are an inseparable part of the cultural heritage of a community. Each traditional house has unique characteristics that reflect the local wisdom and cultural diversity of a region (IDEologi rumah traDISional, n.d.). In order to understand this cultural heritage, it is important to conduct an in-depth study of various aspects of traditional houses, including the tectonics and structures that are the basis for their construction. Buildings are a physical form of construction work that is a single unit (Imanningtyas et al., 2017). Buildings are one of the most important parts of human life, so the durability of buildings is very important to consider in order to maintain the sustainability of the building's age. A building can stand of course cannot be separated from the existence of a structural system inside and outside the building. The structural system is a part that consists of structural elements such as columns, beams, walls, plates, and others

(Saputra & Firmanto, 2017). Meanwhile, tectonics is often equated with structure, material, and construction. However, tectonics discusses more about the aesthetic side created by the structural system used and building construction (Juniwati & Widigdo, 2003). The transformation of a building's modification can display similarities and differences without eliminating certain elements in order to display a certain character as an update to Indonesian architecture (Waani & Rengkung, 2014). The pattern of thinking regarding Nusantara architectural buildings includes the foundations and ideology, structure and tectonics of buildings as well as philosophy (Waani & Rengkung, 2015).

The role of Tanean Lanjhang can strengthen the meaning in terms of the social and cultural order of life in Madurese society (Almunawaroh, 2024). Tanean Lanjhang is a building mass arrangement consisting of floors, walls, doors, columns, roof ornaments, kobhung, roma pegun, dapor and drums as a reflection of the social life of Madurese society (Andini, 2024). With the changing times, it is hoped that society can adapt to create harmony by paying attention to tradition and modernity in maintaining the sustainability of traditional building culture (Novianto et al., 2024). The role of Tanean Lanjhang can strengthen the meaning in terms of the social and cultural order of life in Madurese society (Almunawaroh, 2024). Local materials are traditionally believed to have qualities that can reflect the position and status of tribes in local indigenous communities as a construction artistic value (Kapilawi et al., 2019). One of the traditional houses that attracts attention in this study is the Taneyan Lanjhang Traditional House. The Taneyan Lanjhang traditional house is a traditional house located in an area with unique geological characteristics. Through this study, we can study the tectonic and structural aspects of this traditional house, as well as understand the influence of geological conditions on its construction. The existence of different room components and room dividers also shows the different economic levels of the residents (Widya, 2014). The existence and position of the prayer room plays an important role for the Madurese community, functioning as a center for controlling settlements in terms of socio-cultural, socio-economic and historical aspects (Heng & Kusuma, 2013). Gender differences influence the arrangement of the mass patterns of traditional Tanean Lanjhang houses, which also influences the formation of space based on the individual's daily activities (KURNIA, n.d.).

The study of tectonics and structure in the Taneyan Lanjhang traditional house has an important purpose. First, this study aims to document and understand the structural elements contained in this traditional house, such as wooden columns, types of joints, and roof shapes. After analyzing the structural system and tectonics, then how to apply it to a modern house. By studying these elements, we can appreciate the beauty, strength, and maintain the traditional architecture of the Taneyan Lanjhang traditional house (Baharuddin et al., 2019). This study also aims to examine the role of structure and tectonics in the stability of traditional houses. The structure and tectonics in the area where the Taneyan Lanjhang traditional house stands can act as supports and load-bearing, as well as provide the strength needed to maintain the integrity of this traditional house. In this context, a better understanding of the tectonic aspects will be very valuable in efforts to maintain and develop traditional houses in a more modern package. Tanean Lanjhang in Madurese traditional houses interprets space as an element of cultural values rather than as a form that shows the aesthetics of the building (Tulistyantoro, 2005). The tectonics of the connection to the scale of the height dimensions of the house can provide protection for the occupants inside which also affects intimacy (Febrian et al., 2024). The four main pillars of the Tanean Lanjhang ward building create a central point and create a pseudo division of space (Hidayat et al., 2024).

The main problem of the Tanean Lanjhang research object is the increasing number of existing building forms and materials with various technologies. So in response to this, it is necessary to preserve the sustainability of a real object of a house that uses the Tanean Lanjhang form. Preservation by analyzing the spatial structure along with the tectonics of the building which is the basis for the placement of the building mass to be adopted into the traditional residential buildings of the Madurese people today. This is so that the pattern of the Tanean Lanjhang building mass can continue to survive and be a guide in determining the outer or inner space. From these problems, it is necessary to conduct a study of the tectonics, structure and floor plan of the Tanean Lanjhang building against the buildings of the Madurese people today.

2. Method

The research methods used in this study involve field surveys, primary and secondary data collection, and detailed analysis. Based on this, this research uses a direct field method in the surrounding Madurese villages to explore Tanean Lanjhang in its entirety and in detail. The following is a more detailed explanation of the research methods used:

1. Field Survey

This study involved a direct survey at the location of the Taneyan Lanjhang traditional house. The research team visited the area to directly observe the traditional house, building structure, and surrounding conditions. The field survey was conducted to gain a deeper understanding of the architectural characteristics, structure, and geological conditions around the traditional house.

2. Primary Data Collection

Primary data was obtained through direct observation and interaction with the owners of the traditional house, local communities, and related parties. The research team will systematically observe and record the structural elements in the traditional house, such as wooden columns, joints, and roof shapes. The construction materials and techniques used were also collected through interviews with the owners of the traditional house and community members.

3. Secondary Data Collection

Secondary data was obtained through literature studies related to the Taneyan Lanjhang traditional house. Secondary data sources can include scientific journals, books, visual documentation, and previously documented information related to. This secondary data is used to gain a broader understanding of the historical, cultural, and structural context of the Taneyan Lanjhang house.

3. Discussion

The structure of the building is divided into 3 parts, namely the lower, middle, and upper structures. The lower structure is a structure located below the surface consisting of the foundation. The middle structure is above the surface but below the roof of the building which includes columns, beams, and walls. The last is the upper structure which includes the roof frame (Rinaldi et al., 2015).

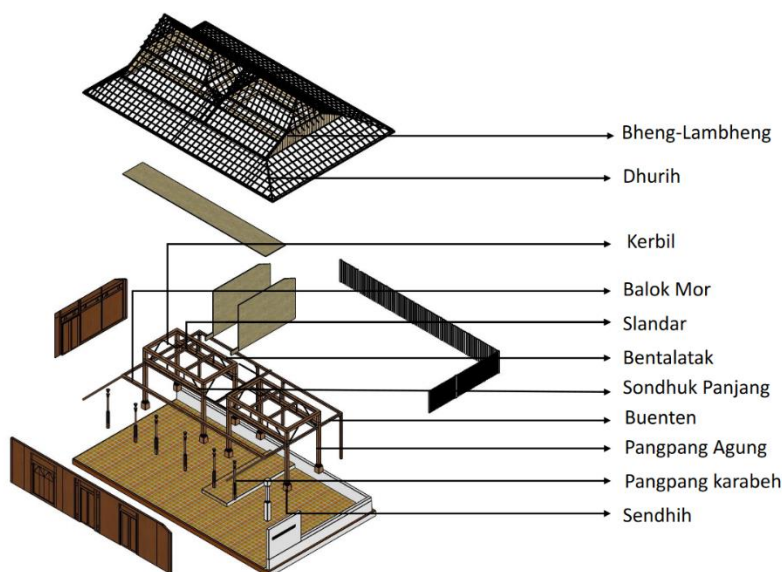


Figure1. Structure of Taneyan Lanjhang

Source: Research team, 2023



Figure2. Perspective of the Taneyan Lanjhang house building
Source: Research team, 2023

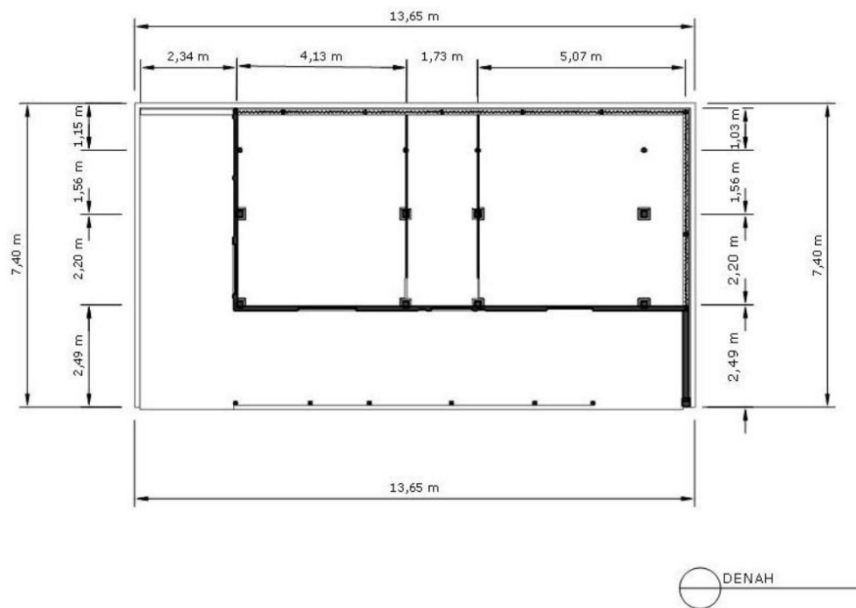


Figure3. Taneyan Lanjhang house building plan
Source: Research team, 2023

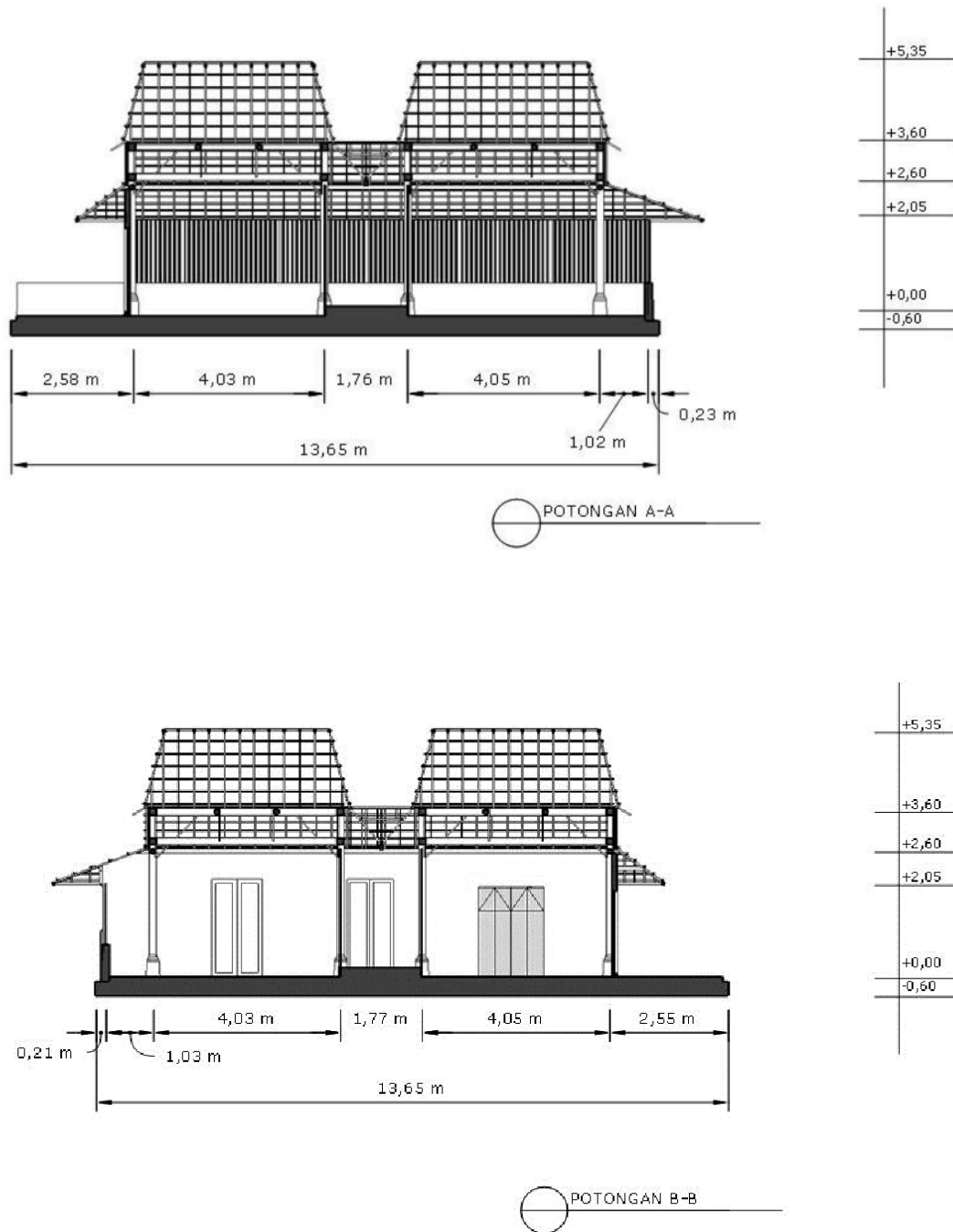


Figure4. Section of the Taneyan Lanjhang house building

Source: Research team, 2023

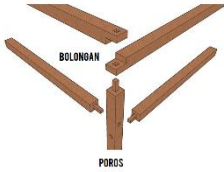
Taneyan Lanjhang has a unique structural system that is different from other traditional houses. The structure is made of wood and without nails so that there are different types of joints. Each structural component and joint has its own name. Data on the structural system and joints were obtained from interviews with local residents.

Table 1. Explanation of the structure of Taneyan Lanjhang

No.	Structure	Element	Information
1	Lower	Sendhih	Functions to transfer the load from the column to the foundation below the surface
2	Middle	Pangpang Karabeh	Load-bearing pillars on the terrace roof area

3		Pangpang Agung	Load-bearing pillars on the main roof area
4		Sondhuk Panjang	Connecting beam between columns
5		Bentalak	The main beam connecting the columns and supporting the roof load
6		Buenten	Bracing located on Mor Beam
7		Slandar	Connecting beam between columns
8		Balok Mor	Roof edge retaining beam
9		Kerbil	Bracing between Bentalak and Pangpang Agung
10		Durih	Lower roof retainer
11	Upper	Bheng-Lambheng	Upper roof retainer

Table 2. Explanation of the Taneyan Lanjhang connection

No.	Connection	Information
1	Hole punch and peg 	A joint that does not use nails but rather drills holes in one piece of wood and makes a protrusion on the other piece of wood that will be connected.

Meanwhile, the tectonics of the lanjhang taneyan can be seen in the shape of Pangpang Karabeh. Pangpang Karabeh is made with an interesting shape because it has typical Madurese carvings, namely pineapple and jackfruit plants.



Figure5. Pangpang Karabeh at Taneyan Lanjhang
Source: Research team, 2023

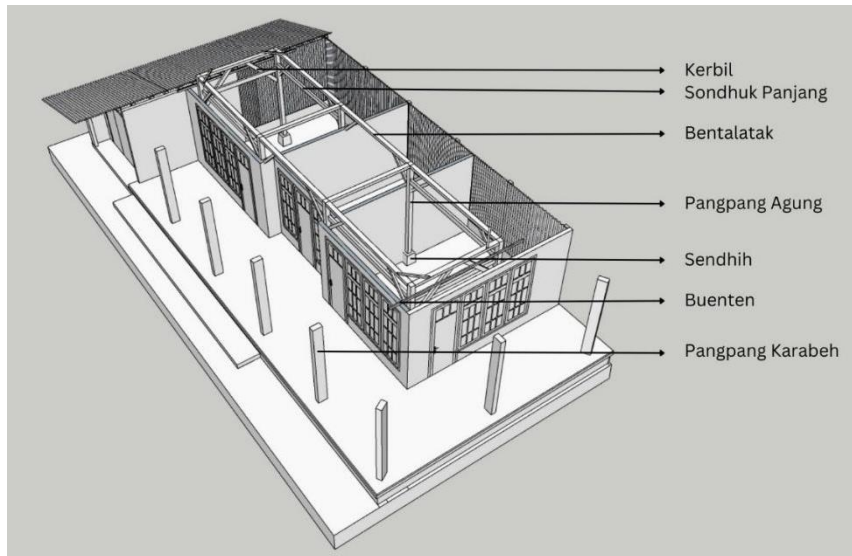


Figure6. Modern Madurese house building structure
Source: Research team, 2023



Figure7. Front view of a modern Madurese house
Source: Research team, 2023



Figure8. Eye level perspective of modern house building
Source: Research team, 2023

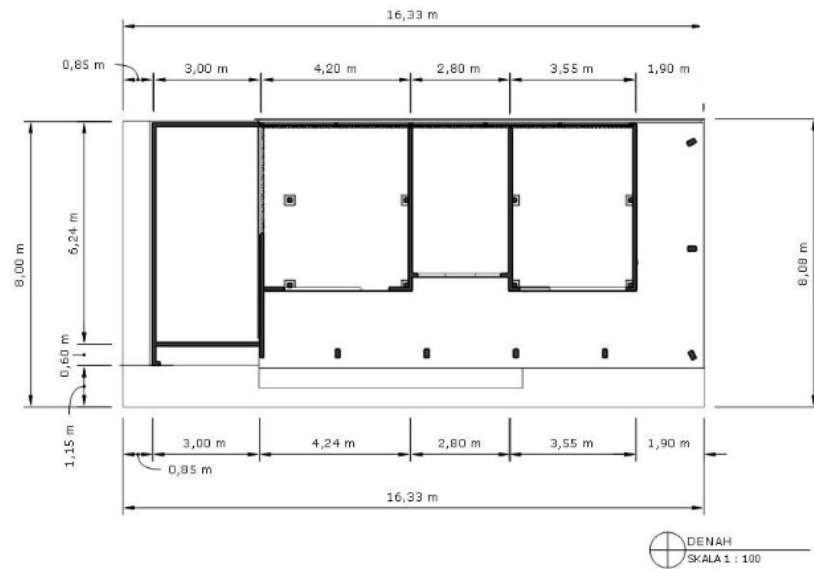


Figure9. Modern Madura house building plan
Source: Research team, 2023

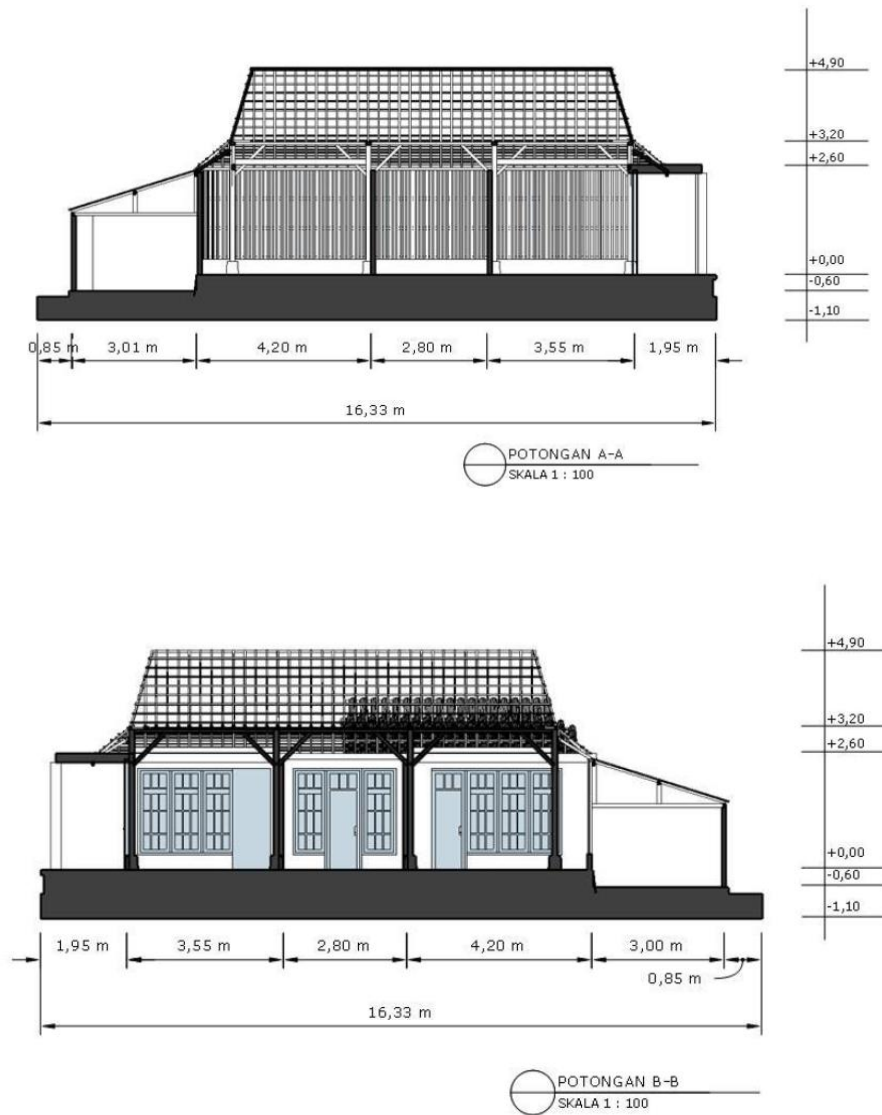


Figure10. Section of a modern Madurese house building
Source: Research team, 2023

From the analysis above, it can be seen that the main structure of the modern house still adapts the original

Taneyan Lanjhang house structure system. This can be seen from the lower structure (Sendhih), the middle structure (Buenten, Pangpang Karabeh, Pangpang Agung, Bentalak, Sondhuk Panjang, Kerbil), and the joints applied to the modern house with a shape that is almost exactly the same as that of the Taneyan Lanjhang house. However, due to the development of traditional houses into more modern houses, there are several differences in the structural system, tectonics, house finishing materials, and the shape of the house plan.

Table 3. Differences in structure, tectonics, and materials of Taneyan Lanjhang with modern Madurese houses

No	Study	Element	Taneyan Lanjhang	Rumah Modern
1	Structure	Roof	It has 2 trellises on the roof, giving a unique and distinctive impression.	The roof has changed into a shield roof like the roofs of today's houses
2		Bentalak	There are 2 sets of roof beams, creating 2 roof beams	The Bentalak connects from the right to the left side, creating just 1 brunjung / 1 shield roof
3		Slandar	There is a platform between the Bentalak beams	Slandar is no longer implemented
4	Tectonics	Pangpang Karabeh	Full of interesting carvings (pineapples and spiral shapes)	Pangpang Karabeh no longer has any carvings and is only plain in shape and only has a structural function.
5	Material	Wall	Dominated by wood materials and woven bamboo/gedheg walls	The majority already use brick walls finished with ceramics
6		Floor	The house is still built on dirt	The floor of the house has been raised to avoid flooding and has been finished with ceramic tiles that match the walls.
7	Plan	Room	There are 2 rooms that function as beds on the right and left side. Between these rooms there is only a small cubicle	Developed to have 3 rooms as bedrooms and an additional building on the left side as a kitchen.

The structure of the Taneyan Lanjhang house is quite advanced because it can be seen that the structural system makes the Taneyan Lanjhang house still stand today with an age of around 100 years. This original structure can also still be applied to modern house buildings. The application of the original Taneyan Lanjhang structure has not only been proven to be sturdy for a long time, but also to preserve the local intelligence of the Madurese people in the field of architecture. However, the structural system in modern houses also continues to change because there are adjustments to the shape and selection of materials. These changes are found in the shape of the roof, the completeness of the structural components (the absence of Bentalak and Slandar), building tectonics, installation of ceramic materials as house finishing. It is hoped that in the future other writers can carry out community service for Taneyan Lanjhang in depth, especially in the material aspects of traditional houses and their changes to modern high-rise houses.

When viewed from the results of the discussion of the differences in various elements in the Taneyan Lanjhang building, the joints related to the tectonics of the building structure are from the roof, bentalak and slander and pangpang karabeh. The changes are because in today's Madurese people use and choose materials that are more durable, easy to obtain and have higher aesthetic/technological value. It can also be seen in the pangpang karabeh section where in modern buildings today the Madurese people no longer use carvings and are plain as a function of the building structure. In addition, on the floors of modern houses, many have used contemporary materials such as ceramics to make them look cleaner and the building floors are raised from the ground elevation. When viewed from the aspect of the spatial arrangement pattern and mass of modern buildings, there are also changes to the traditional Taneyan Lanjhang building which has increased the number of bedrooms to adjust to certain conditions.

4. Conclusion

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