



Boat Representation in Nusantara Architecture

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Abstract. Architecture is one of the arts of cultural product, archipelago culture rooted in traditional culture, vice versa. Traditional architecture is very diverse in Indonesia, along with the diversity of its ethnic. Traditional architecture is building with form and function which has its own characteristic, inherited from generation to generation that can be used to hold activity by the people around it. Therefore, traditional architecture is the cultural expression and direct reflection in presenting something by its people. Some Nusantara Architectures adopt boat as the representation for building's form. Therefore, the author is interested to prove the correlation of boat as representation in some archipelago architectures. This research uses data search method through literature studies by collecting data on some researched archipelago architecture buildings' form and construction system. From these data, a correlation between boat form representation and construction system used in boats and buildings can be concluded.

Keyword: nusantara architecture, form of architecture, boat construction, boat representation.

1. Introduction

Nusantara architecture is a shelter architecture that develops in humid tropics. Spread over the Archipelago around 17,000 islands, located in the ring fire region of the world, have wet forest wealth that is able to contribute oxygen to the world significantly. The Nusantara architecture as the shelter has characteristics in foundation structures, walls and roofs [18].

Exploration knowledge of Nusantara Architecture using traditional architectural data to be analyzed and interpreted architectural. Traditional architecture is formed by geographical ties from a group of communities, so that interactions between humans and humans, humans and the environment occur from time to time.

Traditional architecture is the result of environment that has various variants in each region, this is built in response to nature, material, climate and vegetation [20]. Stilts of building houses take into account the choice of place, material, customs, and environmental conditions. The technique of building a house is inherited through generations, both through rhymes, stories,

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and legends. Each design produces a building shape with regard to the environmental context. The material used is local material that is easily obtained from the surrounding environment. The trial and error process was used as a form of a community intervention in the long term. Therefore in its development, there is an interaction between design and a sustainable environment [1].

Traditional architecture is also defined as an architectural formation that has adaptation to the environment, so that traditional architecture has a high harmony with the surrounding environment [1].

Indonesia has a variety of tribes by having culture, habits, beliefs and language, physically seeing that Indonesia has art, artifacts and architecture that are unique to each region. Some research suggests that some tribes in Nusantara Architecture suggest that the curved ends of the roof are a symbol of 'boat' [16];[20]. Vroglage said that the architecture of houses that resembled the form of 'boats', buffalo horns on the gable of houses, and practices that used boats to take the dead to the funeral ceremony, was a unit of the same cultural wave [16].

Architecture is the manifestation or manifestation of human culture. Architecture is influenced by the culture of society. Adhi Moersid mentions that architecture is a manifestation of everyday life, culture, artistic feelings possessed by society, technology, prosperity, and social structure [3].

Traditional buildings can be interpreted as buildings that are formed from the cultural background of the community. Therefore cultural expression, the way of life, is a direct reflection of society in representing something in the building [20].

Some of the Nusantara Architecture which represents the boat into the building is West Sumatra Minangkabau Traditional House, Tongkonan Toraja Traditional House, Mamasa Traditional House, South Nias Traditional House, Sao Keda Traditional House, Ende Lio Tribe, Sumba Traditional House, Toba Batak Traditional House. There could be other traditional houses that have not been mentioned. Of all the Traditional Houses mentioned, from some literature read the traditional houses which most mention boat representations are the Tongkonan Toraja Traditional House, the Mamasa Traditional House, and the South Nias Traditional House.

The purpose of this study is to prove how the relationship of boat representation is seen from the shape, building material, and construction system of several Nusantara Architecture are Mamasa Traditional House, Tongkonan Toraja Traditional House, and South Nias Traditional House.

2. Literature Review

The representation shows the action of something in the form of an architectural object that represents the existence of another object. It can be concluded that there are two important things in representation, namely, something that represents and something that feels represented [7];[8].

2.1 Representation

Representation is an arrangement or a form that can describe or symbolize something [4]. representation is also something that represents or symbolizes an object. Representations can be represented by the human mindset of an object. For example, Indonesian people have an ethical, virtuous and conception and metaphysical mindset that can encourage the formation of local wisdom. Therefore three cultural expressions can be known such as behavior, ideas, and artifacts [12].

2.2 Boat

The boat is one of the results of the maritime culture that plays an important role in life in the world including the Archipelago. The boat serves to water transportation, trade, and used to find fish to meet family needs. The existence of a boat is part of the transportation of water used by migrants whose population is increasing (Figure 1).

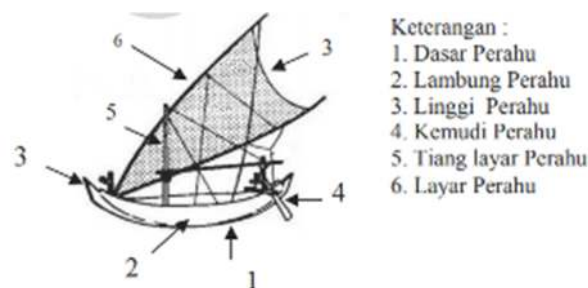


Figure 1. Part of traditional boat in Indonesia

(Source: Said, 2004)

In terms of technology, boats are grouped into two types of boats, namely the shape of a mortar boat and a board boat. Mortar boat made of wood blocks which are intact in the hole in the middle by producing a long, flat shape using plain construction without joints. The technique of making a dimple boat is with straight and round wood bar material with the desired diameter size. Furthermore, the wood is dredged to a certain depth [19]. The type of mortar boat is a boat made with large logs. For board boats only use one tree and produce a variety of boat shapes. Construction of the hull using board and wood joints.

In general, the construction of a boat is made with the technology of Southeast Asian traditions with distinctive features, by having a boarding technique, namely a board necktie technique and 'kupingan' necktie technique.

2.3 Nusantara Architecture

Community knowledge in the oral environment (intangible) in the form of folk tales, myths, legends, song, poetry, saga, chronicles, proverbs and advice and spells and prayers. For example, in Javanese architectural knowledge, the manuscripts in the form of Primbon, Kawruh Kalang / Griya, and Centhini fiber are copies of knowledge that contains guidelines for architectural practices in the Javanese community. The purpose of the guideline of 'petungan' is to present a form of proportion. This guideline is the potential of Nusantara Architecture to show that it is based on knowledge 'theory in architecture'.

The type of theory from Iwan Sudrajat, that 'theory in architecture' examines formal aspects, tectonic, structural, representational, as well as aesthetic principles, and defines theoretical and practical principles for people who want to create building designs [13].

The definition of Nusantara originated from 2 words, "Nuswa / Nusya" and "antara". 'Nuswa / Nusya' means island [11]. Display the characteristics of the Nusantara Architecture as follows:

- Leafy throughout the year: Shelter architecture which is a life together. Reflection is architecture for humans. Shelter architecture is found in structural systems and is related to the environment. The concept of shelter architecture is very dependent on nature, structure, and system outside the location. If the outside conditions change, it depends very much on nature, state of the structure and the system outside the site. When the circumstances outside change, it will have an impact on the quality of the shelter.
- The habit of inhabiting the tree environment is the development of the Archipelago Architecture which has resulted in years of crystallization of experience.
- The Mentawai and Nias Maritime Architecture is different even though its geographical location is close. Madura and inland East Java cannot be equated. The uniqueness of locality is determined by the exclusivity of the past civilization network which is limited by sea water. Cultural space in the archipelago is formed through the exclusivity of the islands. Thus on the vast expanse of the sea, technological advancements are also related to the development of their respective architectures. Nusantara Bahari architecture is related to architecture and technological progress. Starting from a boat in stakes, rowing, juggling, then developing with a sailboat

3. Methodology

This research is descriptive qualitative research that seeks to describe how the process of representation takes place in architecture [5]. This research method uses literature study method to collect data in the form of data, history, and structural systems of Mamasa Traditional House, Traditional Houses of Tongkonan Toraja, and South Nias Traditional Houses.

Some of the Nusantara Architecture which represents the boat into the building is the West Sumatra Minangkabau Traditional House, Tongkonan Toraja Traditional House, Mamasa Traditional House, South Nias Traditional House, Sao Keda Traditional House Ende Lio Tribe, Sumba Traditional House, Toba Batak Traditional House. There could be other traditional houses that have not been mentioned. Of all the Traditional Houses mentioned, from some literature read the traditional houses which most mention boat representations are the Tongkonan Toraja Traditional House, the Mamasa Traditional House, and the South Nias Traditional House.

The data will be used to examine the relationship of boat representation in each traditional house viewed from its history and construction system. By knowing the history and construction system will get results whether there is a relationship representation of the boat in each traditional house studied

4. Result and Discussion

The form of Nusantara Architecture presents the boat into its buildings such as the Mamasa Traditional House, Tongkonan Toraja Traditional House, South Nias Traditional House, West Sumatra Minangkabau Traditional House, Sao Keda Traditional House Ende Lio Tribe, Sumba Traditional House, Toba Traditional House, and some that have not been mentioned. From the literature that mentions the most traditional architecture represents a boat namely the Mamasa Traditional House, Tongkonan Toraja House, and South Nias Traditional House. Therefore, it will be discussed how the correlation of boat representation can be seen from its shape and construction.

4.1 Mamasa Traditional House

Mamasa Traditional House has the shape of the roof like a Sandeq boat [20]. Boat of Sandeq is the fastest and most environmentally friendly Mandar boat in Austronesia. The Mamasa Traditional House is located in the area of West Sulawesi and has a Mandar Tribe. Mandar tribe is a maritime tribe that is directly facing the deep sea. The home page of the Mandar community is the sea. The sea teaches them how to maintain life and build culture. Mandar communities use boats to fulfill their daily needs, carry out activities, take refuge and transportation (Figure 2).



Figure 2. Mamasa Traditional House [9]
(Source : Mithen, 2013)

Mandar communities interact with the oceans and produce knowledge patterns related to the sea. Therefore the Mamasa Traditional House has the shape of a roof like a boat due to the lives of its people who are associated with boats and the sea (Figure 3-4).

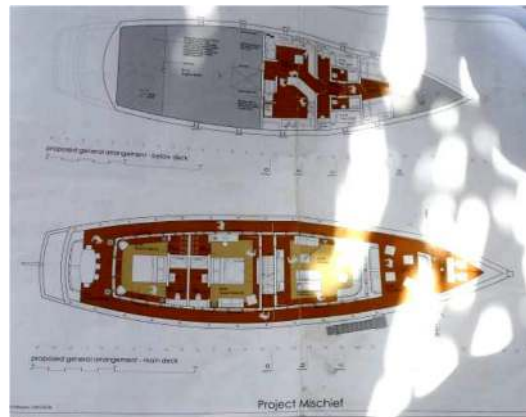


Figure 3. Floor Plan of Sandeq Boat
(Source : Wasilah, 2013)

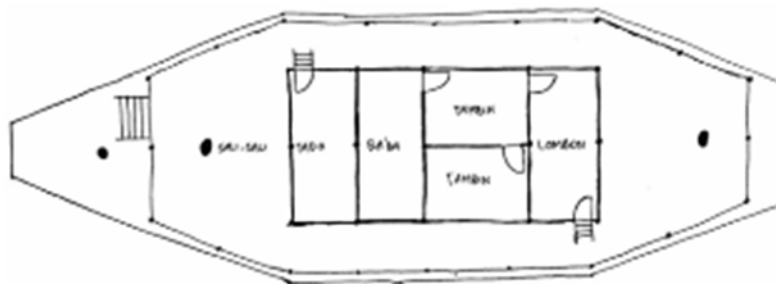


Figure 4. Floor Plan of Mamasa Traditional House

Table 1. Analysis to proves the boat's representation seen from building materials.

Material for making sandeq boats [2]	Material for build the Mamasa Traditional House [20]
Tippulu's wood: light and thick against insect attacks suitable as the manufacture of the hull and the tip of the bow of the boat	Uru's wood to use for house columns
Palapi's wood: stronger than Tippulu but easily attacked by destroyers either on the sea or on land. Used for the manufacture of hulls and floors of boats in the stern	Ring binder for fastenr made of Uru's wood
Sappuq's wood (uling): strong and heavy and resistant to all kinds of destroyers. Used for making the bottom of the boat.	Beams, floors and wall frames are made of Uru's wood.
Punaga's wood: used for making the bow of the boat which is under the bow of the boat	Roof constructions made of Uru's wood and bamboo.
Bagang: for making steering wheel beam	The roof cover is made of Uru's wood or it can also use reeds
Binder using rattan skin	Rattan Binder
Malapau (jackfruit wood): used for the bottom or hull of the boat.	Paint the house using natural materials, namely soil and leaves.
Ranniq's wood: manufacture of wood holders	Roof using fibers or bamboo blades
Pattung: pettung bamboo for making masts	Kasau uses pine wood.
Kuqmil: for making bow ends.	Reng uses areca wood.
Bamboo is placed below the screen for screen weights.	Central pole using jackfruit wood.

Rattan for screen holder and rope wrapped around the pole screen.

Most of the materials used are made of wood.



Figure 5. Construction of Sandeq Boat
(Source: Alimuddin, 2009)

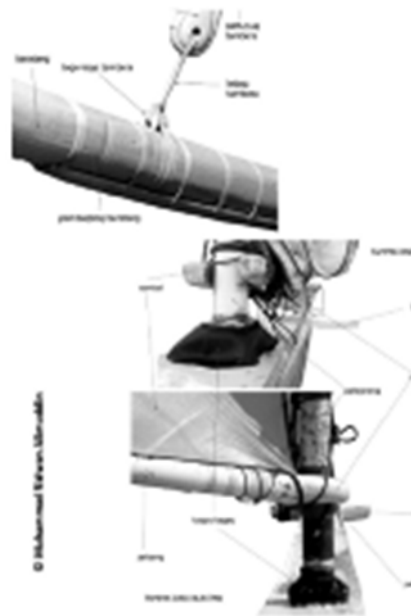


Figure 6. Rattan binder on Sandeq Boat
(Source: Alimuddin, 2009)

An analysis in proving boat representation is seen from the ritual ceremonies in building boats and the Mamasa Traditional House. Making a boat to cut trees for timber is on the full moon, or the 15th day according to the Hijri calendar [2]. The process of making the Mamasa Traditional House was chosen at the beginning of the full moon or the first night of full moon until the 15th night (Figure 5-6).

4.2 Tongkonan Toraja Traditional House

Tongkonan Traditional Houses in the form of boats made of bamboo which are divided into two arranged with overlapping. Based on the allegations of the existence of a cultural 'boat'

relationship carried by the ancestors. They want to maintain something related to the boat in recognition of the cultural heritage of the ancestors. In addition, the relationship between the shape of the roof and their belief that the spirit of the deceased will use a boat to sail to the spirit realm (Figure 7-8) [16].

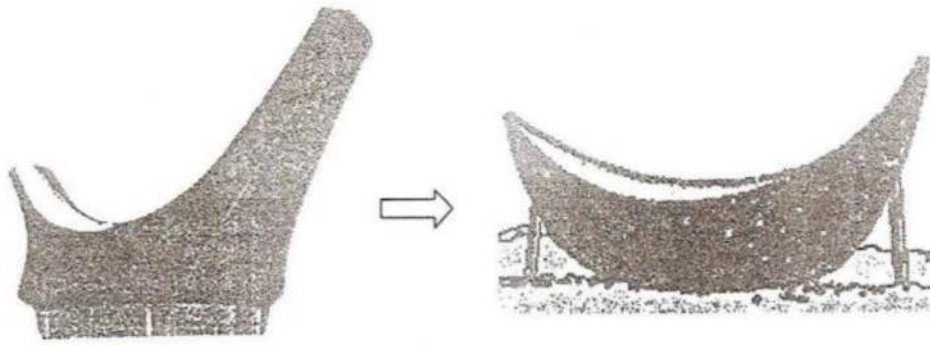


Figure 7. Transforming the shape of the tongkonan roof into a saved boat shape
Construction

Roofing:

- Put up 4 beams
- The roof covering of the bamboo hemisphere is arranged in reverse and pierced with small bamboo, thus forming a roof sheet.

Structural System of Traditional Houses in Tongkonan Toraja [17]

- Leg section (Sallu Banua)
- The body of the house (Kale Banua)
- The top (Rattiang)

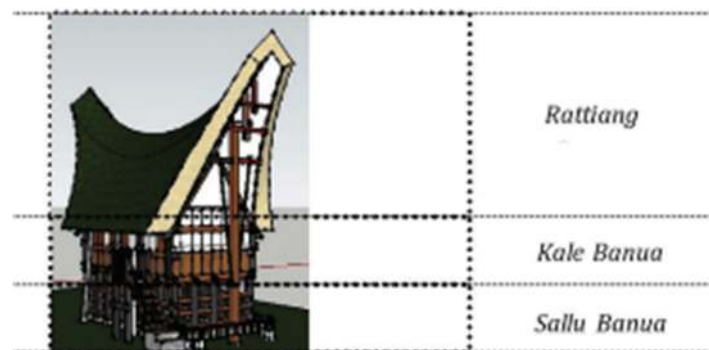


Figure 8. Division of Tongkonan Structure [15]
(Source : Rahayu, 2017)

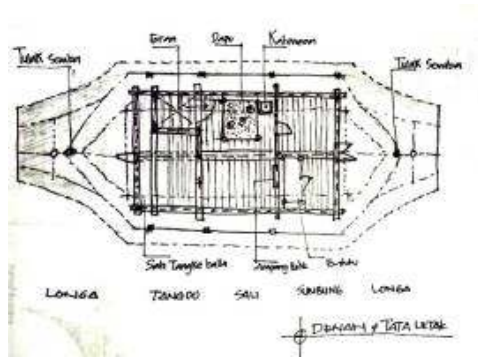


Figure 9. Floor Plan of Tongkonan Toraja tradisional house

Table 2. Analysis proves the boat's representation seen from building materials

Material for making sandeq boats	Material for building the Tongkonan Toraja Traditional House
Rattan Binder	Easel and roof truss connections use a tie system using rattan and pinch systems. Beams and columns with a puncture joint (pen)

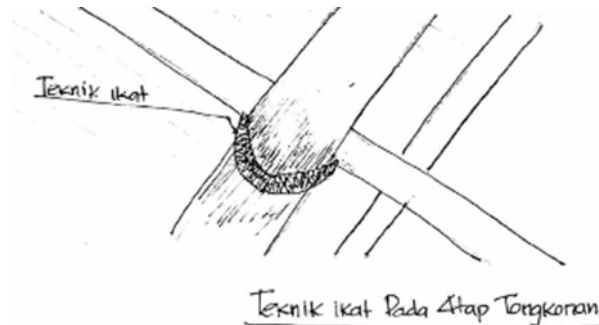


Figure 10. The binding technique on the roof of Tongkonan uses rattan wicker (Sketch the author to clarify the photo quoted in the book.

(Source: Prijotomo, 2018)

Ronald Lewcock and Gerard Brans in Said's [16] book emphasize that the overall appearance of the Tongkonan Toraja house resembles a stored 'ceremonial boat'. In the storage area, the boat is placed on a skeleton above the ground. The boat section is covered with palm leaves to protect the boat section. The community considers that the boat stored in the center of the village has an important meaning that has a 'special power' in the ceremony (Figure 9-10).

It is easy to understand that the influence of boats in building design is used for symbolic-related purposes.



Figure 11. Boats that are stored on land.
(Source: Said, 2004)

4.3 South Nias Traditional House

South Nias Traditional Traditional House is in the form of a stilt with a pedestal system, building poles are placed on a pedestal whose foundation is made of stone (Figure 12).



Figure 12. Pieces of Nias Traditional Houses
(<https://id.pinterest.com/pin/705305991614956657/>)

Material in South Nias traditional buildings [17]

- Stone is used for the swear foundation.
- Strong wood is used for columns, beams, and walls.
- The floor covering material uses a wooden board.
- Roof cover using sago palm leaves or sago leaves.

Hundreds of years ago Ono Niha immigrants brought progress to Nias Island. They reached Nias Island by boat and made a place to live in the river area. The life of Nias people is symbolized as a fisherman, manifested in the form of a house like a boat.

There are two prominent ancestors in the river region, namely Hia and Ho, informing them that Hia's ancestors were revealed to her house. Immigrants Hia came to Nias with equipment. In the South Nias area, it forms a house like a boat. The elements of the boat became an important element in the building of the Nias Traditional House (Figure 13-14).



Figure 13. Features that resemble a boat
(<https://www.museum-nias.org/arsitektur-nias/>)



Figure 14. A form of the boat and houses
(<https://www.museum-nias.org/arsitektur-nias/>)

In addition to Historical Factors, the use of boat forms is related to the conditions of the place in areas with high intensity. For a long time, the people of Nias lived in boats with large sea wave shocks and gained experience that the community was accustomed to the shock. Therefore the people of Nias got the idea that making a boat as their home.

A boat is a place to live that is resistant to sea wave shocks. Nias people hope that by building their houses like boats, they can withstand shocks from the earthquake. This South Nias Traditional House adapts to the conditions of the place and surrounding natural conditions. Their living conditions are often flooded and building materials use materials made of wood, so the house must be made a stilt.

The boat is placed on the stilt and can be seen in the tectonics used by Nias architecture where the structure of poles and foundations is not one unit with the structure of the wall of the building (Figure 15) [10].

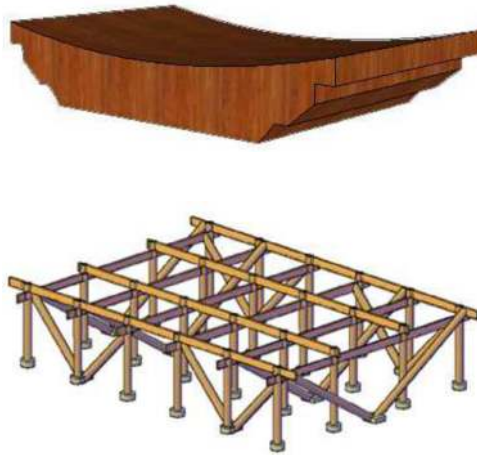


Figure 15. Nias House constructions such as boats are placed on the stilt.
(Source: Nasution, 2018)

5. Conclusion

In the Mamasa Traditional House and the Traditional House of Tongkonan Toraja, apart from being seen from history and formations, it is evident that the material used in boats and traditional houses is broadly defined as wood and bamboo. Judging from the construction, there is one similarity, namely the pole binding material on boats and traditional houses using rattan.

Besides being seen from the artifacts, there are similarities in the selection of days in cutting trees for boats and making Mamasa traditional houses. Namely the selection of the day to cut the tree is done on the full moon or the 15th day. The same is true for making traditional houses carried out at the beginning of the full moon until the 15th day. So the day's election ends on the 15th day.

In the South Nias traditional house, there are similarities in the material, namely using wood. Judging from the tectonics, the structure of poles and foundations is not a single unit with the structure of walls and buildings, as well as boats that are stored and placed on the stilt. From the features in the building also resembles a boat.

The method of making boats and traditional houses has no similarity because the way of making boats and houses is different. In this study, the data obtained is from available literature sources, without any field visits. Further research is recommended to examine the object under study to get the original data source and do it with methods other than those already applied by the author.

Acknowledgment

For the next recommendations can be made to review Nusantara Architecture which also represents the boat as a form of roof or building.

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