



IDENTIFICATION OF LOCAL WISDOM AND ITS RELATION WITH SCIENCE IN THE CONSTRUCTION OF A RUMAH GADANG IN ISTANO BASA PAGARUYUNG, BATU SANGKAR, WEST SUMATERA

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ABSTRACT

Rumah Gadang is one of several traditional houses in Indonesia, precisely located in West Sumatra. Rumah Gadang is a residence for the Minangkabau tribe, which at present is almost extinct and has been replaced by modern houses that exist in this era while the remaining is used as a historical museum site of the Rumah Gadang and the function functions of each room that can be visited in certain areas. like Istano Basa Pagaruyuang, Batusangkar. In order for the knowledge of Rumah Gadang to be maintained until generations, there must be an effort to inherit architectural knowledge from the Rumah Gadang, both from the process of making the first milestone or commonly called the Tuo Milestone until later the end of the making of the Rumah Gadang. This paper aims to describe the process of building a Rumah Gadang so that its preservation can be maintained and to show the relationship between the architecture of Rumah Gadang and Science, so that it is related to the culture of Rumah Gadang and the existing science. And also its relation with other sciences such as social science for example in giving "kaba" or news, good or bad that will be conveyed to the public.

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INTRODUCTION

Longhouses found in many areas in Indonesia illustrate the togetherness between family members and the egalitarian principle in daily life between them. In a society that develops without written culture,

architecture, especially traditional houses and settlement arrangements, becomes a 'book' that reflects the culture of indigenous peoples, including social order and relationships in society, gender, rituals, etc.

(Rapoport, 1969, Nordholt, 1971, Forth, 1981).

In the book "House Form and Culture", Amos Rapoport (1969) argues that the house (traditional) for traditional communities has a non-physical aspect, built not only solely for shelter but the house is part of the physical manifestation between the human / occupant relationship with the universe , which was built for purposes that are more than just sanctuaries.

Minangkabau as one of the ethnic groups in Indonesia has a unique way of expressing their cultural identity through architecture. Minangkabau traditional house is folk architecture or commonly called vernacular architecture, which is architecture that is not realized by the people or 'unconsciousness architecture'. This architecture does not explain rationally why it should happen and what the reason is, except only as a "convention" or agreement that has been rooted in society for a long time. These unwritten agreements and rules are usually about sign systems to convey understanding of buildings, use of building time, human relations in buildings or communication in buildings, sources of materials, energy, and building technology, regulation of building images, regulation of human habitat and the surrounding environment, form and function of space, services in buildings, values and meaning of buildings, and rules for changing or demolishing buildings. This type of vernacular house is a home for most people who do not refer to the classic houses of traditional authorities or nobles. The form of vernacular houses is simple and more functional so that the provision of spaces in traditional Minangkabau homes is adjusted to the needs of residential. The criteria for evaluating the authenticity of a traditional house, for example, habits that become an unwritten regulation when the house is built or used (Sumintarja, 1978).

The overall shape of the building is an element that is immediately caught by the eye. The form of a traditional house is always related to function. Form and function give birth to an 'image'. The various functions that are applied in traditional homes are manifestations of the values and cultural levels of a community group. Initially, the form of traditional houses made only based on mere function. Then after getting to know the culture, the shape of the house gradually undergoes changes related to religious and cultural values adopted by a society. Besides culture, the shape of the house is also influenced by natural conditions, natural resources and human resources (Dewi,2010).

The purpose of this observation is to discuss the adaptation of culture and ethnics in every element of the Rumah Gadang. From this it will be seen that the construction and spatial layout of the Rumah Gadang have close links with the ethnosience or local wisdom of the Minangkabau people.

METHOD

The research method is a chosen way of collecting data to solve the problem being studied and how a study should be conducted. Scientific articles are prepared using systematic methods and steps to facilitate research. In compiling this article, the method of data collection was carried out by direct observation in the field and interviewing several speakers. In addition to field observation, the authors also use the literature study method by collecting literature sourced from journals and other sources related to the construction of the Rumah Gadang. Based on the research method used, it allows the author to produce a description of local wisdom contained in the Rumah Gadang reconstruction such as how the scientific side contained in the building Rumah Gadang that has rarely been known.

RESULT AND DISCUSSION

“Rumah Gadang”, is one of the local wisdoms located in West Sumatra, the original home of the Minangkabau people. In its existence, “Rumah Gadang” has several things that make the “Rumah Gadang” have a side of things in science that can be attributed to science, which turns out that in its making, it is already known at this time why the “Rumah Gadang” is made in such a form and form that already exists. , why are “Rumah Gadang” made without using nails, why “Rumah Gadang” are made using only pegs, it turns out it is all very closely related to the geographical position of the Minangkabau people who are indeed in the vicinity of fragments of earth plates which are very prone to tectonic earthquakes.



Figure 1. Istana Pagaruyuang Batusangkar.

Figure 1 shows “Istano Pagaruyuang in Batusangkar” which is the place where we went to observe the “Rumah Gadang” which is actually the Istana (Palace) where the king lives in Minangkabau. In making this Istana the same thing as making the actual “Rumah Gadang”, where the “Istano Pagaruyuang” has a "Gonjong" or buffalo horn-shaped roof with a total of 11 "Gonjong" and stands on a stone as a support totaling 72 with the same number of poles besides " Tonggak Tuo "then also the construction of building poles tilted to the left and right except the" Tonggak Tuo "which indeed function as the main pillars supporting Istana. At Istana has

a variety of carving motifs and forms totaling 40 kinds, which has the meaning of the meaning of human life. With a roof made of palm fiber and each "Rumah Gadang" has a "Rangkiang" which functions as a storage of rice as a food stock for the residents of the house. “Rumah Gadang” is a traditional house where this house is designed in such a way as to maintain the resilience to earthquakes that often occur in West Sumatra where Sumatra is one of the islands in Indonesia which has many fragments of slabs that are very ambitious to occur in an earthquake, so that if an earthquake occurs, then it is likely to be safe in “Rumah Gadang” and the chance to escape is also great. In its construction, a “Rumah Gadang” is built with old wood so that the building is sturdy and can last for many years. The following will explain some parts of the “Rumah Gadang” in the table.

Table 1. Ethnoscience aspect in Rumah Gadang

No	Description
1	 <p data-bbox="976 1356 1393 1383">In Front View of the Rumah Gadang</p> <p data-bbox="971 1430 1149 1457">Ethnoscience</p> <p data-bbox="971 1465 1398 1661">The body part of the Rumah Gadang, made form of an inverted or widened trapezoid, which is a representation of the ship or sailboat used by the ancestors of the Minangkabau people.</p> <p data-bbox="971 1703 1127 1730">Description</p> <p data-bbox="971 1738 1398 1898">The Rumah Gadang building was made in such a way that the weight of the Rumah Gadang load was heavy on the ground. In physics this is explained in the concept of</p>

No	Description
	pressure, a surface that shrinks to the bottom will automatically increase its pressure to the ground (Oktavia and Prihatmaji, 2019).
2	 <p>The Roof of Bagonjong in Rumah Gadang</p> <p>Ethnoscience The material for the roof cover of the Rumah Gadang is made of palm fiber, which is a coarse black fiber derived from the trunk of a palm tree (<i>Arengan saccharifera</i>) arranged into palm boards using bonding techniques. Considerations in the selection of these materials because they are easily found in nature.</p> <p>Description The choice of palm fiber as a roof covering is an effort to adapt to a hot and humid tropical climate. Fibers are absorbing heat, so that the hot sunlight does not directly enter the room. On the other hand, in the rainy season, fibers are storing heat so that the temperature of the room is kept warm (Setijanti, 2012).</p>
3	 <p>Pole in the Rumah Gadang</p> <p>Ethnoscience In the construction of the Rumah</p>

No	Description
	<p>Gadang, the pole of the house are tilted to tilt to adjust the body shape of the Gadang House that rises upward.</p> <p>Description The pole is erected in a certain angle. If a straight line is drawn from each pole in the direction of Earth's gravity, then the line will meet at a point far below the earth. This is the proof of people's belief that such a construction design can increase the resistance of Rumah Gadang to earthquake shocks (Dewi, 2010).</p>
4	 <p>Back View of the Rumah Gadang</p> <p>Ethnoscience The wall covering material at the back of the Rumah Gadang is made of woven bamboo blades called the tadir wall "Sasak bugih". In the past people used these materials because they were easy to find, besides they were strong and good.</p> <p>Description The arrangement of woven bamboo slats on the back wall of the Gadang House can function as a ventilation of space to drain fresh and healthy air, so that the air in the residential space is protected from moisture (Setijanti, 2012).</p>

No	Description
5	<div data-bbox="323 226 708 600" data-label="Image"> </div> <p data-bbox="316 604 717 634">Foundation of the Rumah Gadang</p> <p data-bbox="300 674 480 703">Ethnoscience</p> <p data-bbox="300 709 737 1073">The foundation of the Rumah Gadang form of a <i>sandi foundation</i>, which has a rectangular arrangement like the arrangement of the pillars or poles, because the joint is where the pillars stand as columns in the Rumah Gadang. With the installation system just placed at the points that have been determined, then only the poles were erected above the <i>sandi</i>.</p> <p data-bbox="300 1115 459 1144">Description</p> <p data-bbox="300 1150 737 1516">Making foundation like this is to avoid cracks in building columns during an earthquake. The connection between the wooden column and the password foundation is flexible. The column is not planted in the foundation, but only superimposed. When an earthquake occurs the connection column and foundation will not be broken, but can be shifted (Ihsan, 2008).</p>

CONCLUSION

There is a lot of local wisdom in the construction of Rumah Gadang that can be studied scientifically. Starting from the selection of materials, the manufacturing process, and the layout of poles and spaces. In the beginning, people made Rumah Gadang without any scientific knowledge, they only made use of the limited knowledge they had. All the processes carried out in the

making of the Rumah Gadang refer to the nature of the Minangkabau itself in accordance with the philosophy of Nature Takambang Become a Teacher. However, as time goes by many people do research on the construction of the Rumah Gadang which is one of the expressions of vernacular architecture and many sides that have been scientifically tested. West Sumatra is one area surrounded by many plates where this plate can affect the geographical situation in West Sumatra which often occurs tectonic earthquakes. The gadang house is one of the houses where the foundation made is earthquake resistant, if an earthquake occurs then the chance to save yourself outside is greater. Starting from the foundation where the column is not planted but only placed so that if an earthquake occurs there will only be a shift and not broken if the earthquake stops then it will return to its original position. Then the roof where the fibers are the main ingredient that is heat absorbent so that in the dry season the temperature in the room is maintained and in the rainy season the temperature in the room remains warm due to the fibers storing heat, and is waterproof. Then the shape of the walls of the house are made of woven which can absorb fresh air so that residents do not feel hot, and humidity is also maintained. The sloping pole shape besides the "Tuo Milestone" is also believed to have the resilience to keep the house stable in the event of an earthquake, and the tuo milestone to maintain the ultimate resistance in the "Rumah Gadang.

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