

Bale Tani and *Alang* in the Perspective of Science, Local Wisdom and Community Religiosity “Gumi Sasak” Lombok (Preliminary Study in the Development of Science Learning Devices Based on Local Wisdom and Islamic Values)

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Abstract: The existence of "Bale Tani" and "Alang" in the present time is now rarely encountered, as they have been replaced by more modern buildings and storage spaces. This research aims to examine "Bale Tani" and "Alang" from a scientific perspective, as well as to explore their significance in terms of local wisdom and the religious beliefs of the Sasak tribe on Lombok Island. This study employs a qualitative method through an in-depth investigation. Researchers directly engage in fieldwork to conduct observations, interviews, and document the objects of study. The research data's credibility is enhanced through triangulation techniques (multiple sources and methods) and supported by relevant reference sources. From a scientific standpoint, both "Bale Tani" and "Alang" are structures designed for disaster mitigation (such as earthquakes and floods) and to protect stored items from humidity, thus preserving them. Based on local wisdom and religiosity, this research reveals several aspects. Notably, their exceptional architectural design and unique forms, which are distinct to Pulau Lombok and not found elsewhere. Their multifunctional nature is highlighted, serving as spaces for storage, rest, gatherings, seating, cooking, and other activities. The alignment of "Bale Tani" towards the east facilitates the determination of the Qibla direction for prayers. The "Alang," functioning as storage for harvest yields, carries the significance of expressing gratitude among the Sasak tribe to their deity for the bestowed sustenance. Consequently, the Sasak community practices frugality by storing their harvest in the "Alang" as a manifestation of this gratitude.

Keywords: *Bale Tani and Alang*; Local Wisdom; Lombok; Religiosity; Sasak; Science

Introduction

The existence of *Bale Tani*, *Alang* (*Bale Lumbung*) and several other types of traditional houses in Lombok society has begun to erode. Its existence is also rarely found in villages let alone in urban areas. This is inseparable from the influence of modernization of buildings and architectural influences from outside. There is nothing wrong with people's behavior choosing buildings that are simpler and easier to build. But

unfortunately, this tradition actually has a deep philosophical meaning by the initiator and of course contains local wisdom that has not been touched by today's younger generation. As stated Susilo, Umniati, and Herlia (2019) architecture of the Sasak tribe who are on the island of Lombok, West Nusa Tenggara, its existence is only a relic, a legacy from their ancestors which is partly used as a tourism object, and some are forced to use it as a place to live. Meanwhile, today's modern society is reluctant to build houses according to

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their traditions, but prefers modern buildings, which use adobe or brick walls.

At several points on the island of Lombok there are still those who preserve *Bale Tani* and *Alang* and become part of tourist objects and destinations. One of the famous locations for the existence of *Bale Tani* and *Alang* is Kampung Sade and Nde which is located in Central Lombok. Many foreign and domestic tourists are interested in the existence of *Bale Tani* and *Alang*. Not only because of its unique shape and function as a storage for harvests, but the philosophical meaning implicit in the architecture of *Bale Tani* and *Alang* is something that deserves a deeper dive. So it is not uncommon for some researchers and humanists to try to uncover the meaning of every existing local wisdom.

From a scientific point of view, it is no less important to explore. It is interesting to peel from the shape, the constituent materials, the manufacturing process, disaster resistance, function, and more from a scientific review. The earthquake that frequently shakes the island of Lombok (which is still being felt in the middle of 2018), may be one of the reasons for local wisdom to make *Bale Tani* and *Alang* by the people of Lombok. Seen after the earthquake, it can be seen that the *Bale Tani* and *Alang* buildings, as well as the original Sasak tribe buildings, are still standing strong. As revealed by (Munandar, 2018), the phenomenon of the Lombok earthquake on July 30 2018, based on direct observations of researchers when they were volunteers supplemented with data from the National Disaster Management Agency (NDMA) and the Regional Disaster Management Agency of West Nusa Tenggara Province, found the fact that the traditional house of the Lombok people turned out to be the building that was the least affected by the earthquake (Munandar, 2018). So that the Sasak people (Lombok Indigenous people) who still inhabit and live in their typical traditional houses can be safe from the dangers of the ruins of their houses. Even the traditional house was not collapsed or damaged at all. In contrast, the houses of the general public in Lombok that did not use traditional construction systems experienced massive destruction. In fact, an ironic situation occurred in many places, where in one village area houses built with traditional structures remained standing upright while buildings with non-traditional structures collapsed right next door.

Therefore, it is intriguing to delve deeper into "Bale Tani" and "Alang" (traditional rice barns) as ancestral heritage of the past Sasak community. With the hope of providing additional insights and fostering a deeper appreciation for these structures, which hold not only artistic significance but also profound ideas in terms of science, local wisdom, and embedded religiosity.

Method

This research includes qualitative research (Silverman, 2004). The type of data collected is in the form of primary data through observations, interviews and documentations. Observations made included in the study of participant observation in this case the researcher was directly involved in the field observation process (Samsu, 2017).

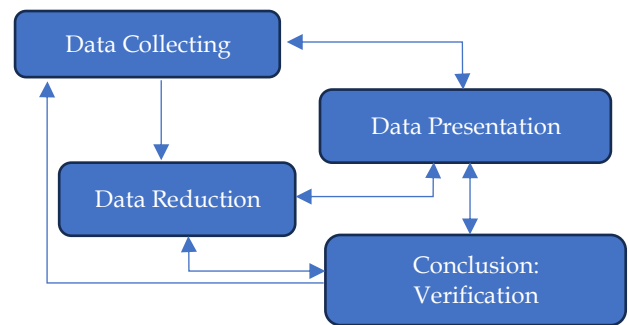


Figure 1. Steps of Qualitative Research

While the interviews implemented in this study were used by researchers to find out things from respondents that were more in-depth related to the material to be studied. Every stage when going into the field is strengthened by the stages of documentation (taking pictures, recording audio and video) (Raco, 2018).

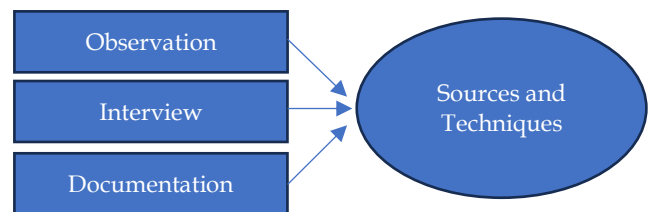


Figure 2. Triangulation Sources and Techniques

The credibility of the research data used data triangulation techniques (sources and techniques) and used reference materials. Source triangulation is used to test the credibility of the data by checking the data obtained through various sources. While technical triangulation has an emphasis on checking the same source with different techniques. The reference material mentioned is the existence of supporting data to prove the data that has been found by researchers.

Result and Discussion

Traditional Sasak House Building

Lombok Island is part of the West Nusa Tenggara Province. Geographically it is located between Bali

Island and Sumbawa Island. The map of Lombok Island is presented in Figure 3 (Oriflameid, 2020). Lombok Island is a tourist destination because of its natural beauty and the many tourist objects on Lombok Island such as nature tourism, beach tourism, cultural tourism and culinary tourism (Irfan & Apriani, 2017).



Figure 3. Position of Lombok Island, West Nusa Tenggara

The tribe that inhabits Lombok Island is known as the Sasak tribe. The origins of the Sasak ethnic group on Lombok Island can be studied from the word Sasak itself. Sasak etymologically, according to Goris S, comes from the word sah which means "to go" and shaka which means "to go to the ancestral land". From this etymology it is suspected that the ancestors of the Sasak people were Javanese, this is also evident from the Sasak script which the people of Lombok call "Jejawan", namely Javanese script, which is completely accepted by Sasak literature. The Sasak tribe is the majority ethnic group which accounts for approximately 90% of the total population of Lombok (Ersina et al., 2014).

In an effort to uncover the values of 'local wisdom' in the people of Lombok, it is necessary to examine the socio-cultural, socio-economic and also socio-ecological backgrounds of the people. The original beliefs of the Sasak tribe, who are the majority of the population of Lombok Island, are animism and dynamism, and now the majority embrace Islam. But the influence of Hindu culture, especially the shape and style of the building, is assimilated from Bali. Since ancient times, the Sasak tribe has been known as one of the tribes in the Indonesian Archipelago which was included in the Majapahit Kingdom. The book Negara Kertagama, written by Empu Nala, mentions the tribe that inhabits the island of Lombok, namely: 'Lomboq Mirah Sak-sak Adhi'. In the Sasak ethnic community, there is a cultural system that is categorized as well established. As time goes by, the Sasak tribe still exists today with its cultural forms and customs. One of the proofs of this established cultural form is: the existence of the building form (architecture) of the house where they live and the storage of their crops (Pawitro, 2011). Here are presented *Bale Tani* and *Alang* (Figure 4).



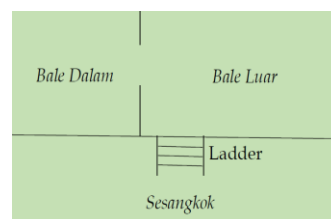
(a)



(b)

Figure 4. The Picture of Bale Tani (a) and Picture of Alang (b). Alang in Sade Village (Left) and Alang in Village Nde (Right)

Based on the results of interviews with the guide who accompanied the observations in Sade and Nde Villages, the terms *Bale Tani* and *Alang* have different functions. *Bale Tani* is used as a place to live and daily activities. While *Alang* or granary functioned to store crops. The materials that make up *Bale Tani* and *Alang* all use ingredients from nature. The foundation uses soil smeared with buffalo dung. While the walls, walls and roof are made of bamboo, wood, rattan and pandan as a rope (binding). Broadly speaking *Bale Tani* is divided into 3 parts, *betaran/sesangkok* (outside), *bale luar* (inside the house), and *bale dalem* (room). *Betaran* is used to welcome guests and other activities such as weaving (*nyasak*) and sleeping for men (fathers and brothers). Meanwhile, the *bale luar* is used as a bed for girls or newlyweds. Finally, the space in the bale is used for storage and cooking. The following are the parts of *Bale Tani* (Figure 5).



(a)



(b)

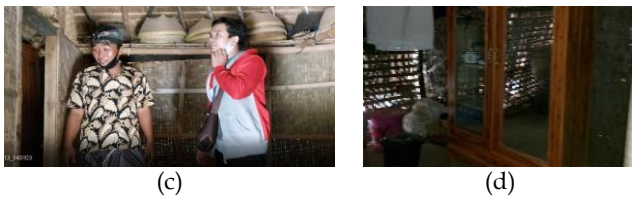


Figure 5. The parts Bale Tani: (a) floor plan of *Bale Tani*; (b) *Sesangkok*; (c) *Bale luar*; (d) *Bale Dalem*.

One of the interesting things in several tourist destinations in Lombok, *Alang* or *Bale Lumbung* is one of the designs being developed. Like hoteliers in Gili Trawangan. *Alang* is used as one of the hotel room models as a wealth of local wisdom or culture of the Sasak tribe and has philosophical and aesthetic values that are the main attraction for every tourist (Yusanti & Indraprasti, 2018).

Bale Tani and Alang in Science Studies

Based on the scientific point of view, *Bale Tani* and *Alang* have knowledge requirements in it. Especially related to disaster mitigation such as earthquakes and floods which are difficult to predict. With the material being made of light and buoyant material, it will reduce the risk in the event of a disaster in the form of an earthquake and flood. As revealed by Pawitro (2011) All building materials used in constructing *Bale Tani* and *Alang* are wood and bamboo. These materials are obtained from the environment around them where they live and materials that exist in the environment they live in, not 'foreign' materials that they are not familiar with. Even to connect the wooden parts of the traditional house, they use nail made of bamboo called 'pasak' (Susilo et al., 2021)

Bamboo has a fairly high strength; its tensile strength can be compared with steel. however, the high strength of bamboo has not been put to good use because usually the stems of the bamboo structure are strung together with pegs or ropes that have low strength. Based on a physics study, bamboo is in the shape of a pipe so that the moment of humidity is high, so that bamboo is good for carrying bending moments. Coupled with the elastic nature of bamboo, the bamboo structure has high resistance to both wind and earthquakes (Artiningsih, 2012).

The construction of *Alang* as a storage for harvests is no less interesting. The round shape of the *Alang* pole has implications for the difficulty for animals to climb up and eat the food/crops stored in it. The location of food storage reserves at the top of the building avoids excess moisture so that the crops will last longer. Its location at the top will also facilitate exposure to sunlight so that crops such as grain and crops will maintain their moisture content and quality.

Bale Tani and Alang in the Value of Local Wisdom and Religiosity

Etymologically *Bale* is a house used by the Sasak people as their place of residence. While *Alang* is a house used as a place to store crops or rice and all the needs of the Sasak people. In addition, *Alang* is also used as a resting place or *tokol-tokol* (sitting). Currently, *Bale Tani* and *Alang* can be found in Sade Village in Rimbitan Village and Nde in Sengkol Village, Pujut District, Central Lombok Regency. In these two villages *Bale Tani* and *Alang* are still standing strong, the constructions were very sophisticated in their time and have been maintained until now as a form of local wisdom.

Based on the interview results, *Bale Tani* and *Alang* have existed since the 17th century since the reign of the Karang Asem Kingdom. The inside of *Bale Tani* is divided into several parts, namely *sesangkok/bataran* (outside) and *Bale Dalem* (inside the house). *Bale Tani* is also equipped with a kitchen, food storage area, and *ampen*. The main material for making *Bale Tani* is bamboo measuring 2x2 m. The entrance or *sesangkok Bale Tani* is made with a sliding system, apart from that *Bale Tani* has three staircases that serve as a link between the outdoor and indoor rooms. *Bale Tani*, which is the original home of the Sasak tribe, is a very popular distinctive icon, because it has a shape that can attract a lot of attention from anyone who sees it.

Alang has a shape like a house on stilts, with a roof that has a pointed end that widens and goes straight down. Distance to the ground 1.5 – 2 m and a diameter of 1.5 – 3 m. The roofs of *Bale Tani* and *Alang* are made of dry straw which are arranged very tightly. So it is resistant to rainwater, and able to dispel the hot sun. Usually, it will be replaced within 7-8 years in mutual cooperation. There is a window on the *Alang* roof, which functions as a place for air circulation. Meanwhile, the floor of the *Alang* traditional house is made of wooden planks supported by poles made of soil and stone. The pillar has a total of four which is also used as the foundation of the building.

Some of the interesting things about *Bale Tani* are that the foundation comes from the ground and is covered in buffalo dung. Based on the presentation of the local community, the land that becomes the floor is a symbol of the origin and return of humans. So that there is no arrogance and arrogance in the human person. Interestingly, buffalo dung, which is used as a cleaning tool for building foundations, has a philosophical meaning, showing that the residents there live by farming, and cow dung is believed to be able to glue cracked soil together and repel certain types of insects, such as mosquitoes. However, this needs to be investigated in more depth. As revealed by Surasana (2015) the people of Kampung Sade use buffalo dung

moistened with water to mop the floor of *Bale Tani*. From a health point of view, this is certainly not good in terms of cleanliness and brings disease and an unpleasant smell. Interestingly the informants who were interviewed, mopping with buffalo dung makes the floor odorless, avoids mosquitoes and causes the floor to not dry out in summer (Surasana et al. 2015)

The philosophy of *Bale Tani* and *Alang* is a reflection of the level of social strata of the Sasak people. The Sasak people who owned *Alang* in ancient times reflected people who were in the upper middle class welfare category. Positionally, *Bale Tani* facing east or west has a philosophy as a symbol of the belief of the Sasak tribe in Islam. East or west direction makes it easier to find the Qibla direction or the direction of Prayer. The door is small and low, indirectly requiring guests to bow when entering, this also has a philosophical meaning that guests must have ethics to respect the host. If you don't duck, you will automatically be "sucked in" by the top of the door, meaning that person will be punished directly.

Alang or a place to store crops has a philosophy as a form of gratitude for the people of the Sasak tribe for the sustenance that has been given by their God. So that the Sasak people live frugally by storing their crops in a *Alang*. According to Hassan (2022) There are several steps involved in making reeds. These steps are preparing the materials and tools, preparing the place for making *Alang*, making the bottom, making the base or seat, making the top, making the top base, making the roof frame, making the wall frame, and covering the roof. (Husnan, 2022).

The construction of this *Alang* is designed to be anti-rats, the poles are round and have a circle on the top of the pole (*Jelepeng Alang*) which makes rats unable to climb up. Besides that, the way to make it is quite natural. *Alang* is made from loam (rey) trees and how to install it without using nails, just connecting and installing it according to the path that has been made. The roof is made of *Alang-Alang* plants and there is a window so that fresh air can enter the storage room for the harvest.



Figure 6. Jelepeng Alang

The house is an 'expression' as well as the expression of the most real thoughts and attitudes of an individual (individual) or group in realizing relationships with fellow human beings (community or society), with nature environment, and also with God Almighty. The existence of traditional Sasak houses, both in terms of shape (architecture), spatial planning and building structures, in traditional Sasak houses contain symbols that are full of high philosophical values (adhi-luhung) and sacred (holy). Among these values include: The roof of the house with a very low design is equipped with a small door so that guests who come have to 'bow down' when entering the relatively short door of the house. The attitude of 'bowing' is a characteristic of the attitude of 'mutual respect' between the guest and the host.

Building houses with the same direction and size shows that people live in harmony. Therefore, if someone builds a house that is not in the same direction as the existing house, this indicates that the inhabitants of the village are not harmonious. The position of the houses in Sade and Nde villages are lined up to form a linear pattern and the direction is facing west and east. This condition makes it easier for people who are predominantly Muslim to find directions to pray. According to Lukita et al (2016) states that the direction of the house to the west and east is the direction of the sun and is believed to give blessings (Lukita et al., 2016). As has been understood that the sun is the greatest energy absorbed by the earth. With light, plants can photosynthesize, pro-vitamin D in the body when exposed to morning sunlight will convert it into vitamin D, as a source of natural lighting and others.

The architectural form of *Bale Tani* illustrates that human relations must be balanced. The relationship in question is the relationship between human beings, ancestors and God Almighty. The division of space in *Bale Tani* is divided into 2 major parts, namely *Sesangkok* and *Bale Dalem*. As soon as people enter the house, they will be confronted with *Sesangkok* or living room. To go to *Bale Dalem* we have to pass through a ladder with three or four steps. The number of steps represents God, ancestors and fellow human beings. Entering *Bale Dalem* there is a *jangkitih* or kitchen on the left, while on the right there is a *Dalem Bale* which is used to store family assets including rice for daily needs. To store property, an Upper Awning will be made or a kind of place to store goods (upstairs) at the top. *Bale Luar* describes the relationship between humans to respect each other and maintain a family attitude, while *Bale Dalem* which is more private, shows the very important role of women in a family, because in it there is a kitchen and a bed for girls who are still virgins. (Lukita et al., 2016).

Based on the exposition above, incorporating local wisdom and Islamic values (religiosity) into the process of science education needs to be considered. Science education that integrates local wisdom can support various aspects of learning outcomes (Andriana et al., 2017; Arizona et al., 2023; Dwianto et al., 2017; Hikmawati et al., 2021; Mukaromah et al., 2022; Suastra et al., 2017; Sukmawati et al., 2022; Yanti et al., 2022; Zannah, 2023). Local wisdom values in science education can foster scientific process skills (Dwianto et al., 2017; Mukaromah et al., 2022; Yanti et al., 2022), scientific literacy (Dewi et al., 2019; Eviyanti et al., 2022; Setiawan et al., 2017; Sukmawati et al., 2022), scientific attitude (Dwianto et al., 2017), keterampilan berpikir (Ramdani et al., 2021), and character (Hartini et al., 2018; Suastra et al., 2017). Similarly, incorporating values of religiosity (Islamic values) can enhance various skills, attitudes, and knowledge (literacy) of learners in the learning process (Al-Idrus et al., 2023; Fahyuni et al., 2020; Farida et al., 2017; Praptiwi et al., 2021; Safkolam et al., 2021).

Conclusion

Bale Tani is a traditional residence of the Sasak people which is made of 100% natural materials. Meanwhile, *Alang* is a type of granary in the Sasak people of Lombok Island, West Nusa Tenggara. *Alang* is classified as a traditional non-residential building. *Alang* has a function that is almost the same as other types of barns, namely to store food ingredients, especially rice and secondary crops. The existence of *Alang* today is rarely found, replaced by more modern buildings and storage rooms. Based on the scientific point of view, *Bale Tani* and *Alang* have knowledge requirements in it. Especially related to disaster mitigation, especially earthquakes and floods which are difficult to predict. With materials that are made of light and floatable materials, it will reduce the risk in the event of a disaster in the form of an earthquake and flood. The round shape of the *Alang* pole has implications for the difficulty of animals such as mice to climb up and eat the food stored above it. The location of food storage reserves at the top of the building avoids excess moisture so that the crops will last longer. The study of local wisdom and religiosity values by *Bale Tani* and *Alang* gives a deep study meaning starting from the existence, manufacturing system and values of local wisdom. Some of the things that were revealed in this study include the special building design, its unique shape and not found outside the island of Lombok. Based on its multifunctional use starting from storage, resting, gathering, sitting, cooking, and doing other jobs. Each style of the building design has a philosophical meaning

such as the position, *Bale Tani* facing east/west which has a philosophy as a symbol of the belief of the Sasak tribe in Islam. East/west direction makes it easier to find the direction for worship (Salat). The door which has small dimensions and is short, makes the guests have to bow, this also has a philosophy that guests must have ethics to respect the host. *Alang* for storing has a philosophy as a form of gratitude for the people of the Sasak tribe for the sustenance that has been given by their God. Therefore, the Sasak people live frugally by storing their crops in the barn.

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Author Contributions

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Conflicts of Interest

The authors declare that there is no conflict of interest regarding the publication of this paper.

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