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Development of A Two-Story Minimalist Type Residential House Design Based on The Local Wisdom of The Bugis Tribe and Environmentally Sustainable

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Abstract

The purpose of this research is to find: (1) development of a two-story minimalist type residential house design based on the local wisdom of the Bugis tribe and environmentally sustainable, (2) steps to implement the design, and (3) supporting and inhibiting factors for design development. The research locations were Bone, Soppeng and Wajo regency, selected using the purposive sampling method. The research sample of 300 people were selected using the purposive sampling method. The variables considered are: (1) the design of a two-story minimalist type residential house design based on the local wisdom of the Bugis tribe and environmentally sustainable, (2) steps in implementing the design, and (3) factors supporting and inhibiting the implementation of design development. The analysis used is qualitative descriptive analysis. After concluding the analysis, the next step is to develop the design. The results of the research show that: (1) the development of a two-story minimalist type residential house design based on the local wisdom of the Bugis tribe, and environmentally sustainable as seen from: (a) the position of the sun, facing east, (b) the contour of the land, facing higher and flatter direction, (c) the front of the house faces the main highway, (d) the roof slope is 25-30 degrees, and (4) the roof shape is saddle and shield, (2) the steps for implementing the design are: (a) conducting socialization, (b) provide explanations about hearty houses and local wisdom of the Bugis Tribe, and (c) collaborate with relevant stakeholders. (3) supporting factors for implementing the design are: (a) affordable selling price for the lower economic class, (b) available land for developing houses and green open areas, (c) the house design is classified as hearty, and (d) availability of roads, clean water and electricity facilities. The inhibiting factors are: (a) the Bugis tribe has forgotten their local wisdom, (b) planning consultants and developers do not comprehend the local wisdom of the Bugis tribe.

Keywords: Visible design, minimalist type, local wisdom, bugis tribe, environmentally sustainable

Introduction

Population growth has an impact on the provision of healthy and environmentally safe residential housing. Law Number 32 of 2009^[1] explains that, in building residential houses, the environment should be utilized as needed so that it remains sustainable. Trainer (2011)^[2] stated that, in building, natural resources should be used as needed. Muhammad Ardi (2017)^[3] stated that a residential house should have a beautiful plan, appearance, and supporting facilities, efficient, safe construction, have social and cultural values, and be a place for families to rest and joke. Local culture or wisdom cannot be separated from the design of residential houses that are safe for the environment. Marfai (2012)^[4] stated that

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local wisdom is another form of environmental ethics, namely a set of knowledge obtained through the process and learning of a group of people.

The construction of residential houses by *developers*, as well as those built by the Bugis Tribe community continues. Developers does not pay attention to the local wisdom of the Bugis Tribe, and sustainable environmental aspects. The development of a two-story minimalist house design based on the local wisdom of the Bugis Tribe, and environmental knowledge is not yet available to residential house planning consultants, *developers*, and other *stakeholders*, while the market demand is quite high.

This study aims to determine (1) the development of a two-story minimalist house design based on the local wisdom of the Bugis Tribe and environmentally sustainable, (2) the steps to implement the design, and (3) the factors that support and hinder the implementation of the development of a two-story minimalist type house design based on the local wisdom of the Bugis Tribe and are environmentally sustainable.

Theoretical Studies

In Law No. 4 of 1992^[5] it is stated that, a house is a building that functions as a residence or dwelling and a means of fostering a family. Muhammad Ardi, et al. (2017)^[3] stated that a residential house is a place of residence that meets the requirements of a decent life. Muhammad Ardi, et al. (2018)^[6] stated that a house is a place where humans live, carry out the process of socialization, interact socially and introduce culture.

Muhammad Ardi, et al. (2017)^[3] stated that, to build an environmentally sustainable residential house, a strategy is needed that can accommodate human aspirations and desires, while still paying attention to a sustainable environment. Nurhasan (2010)^[6] stated that the house is the main forum to increase the potential of human resources for all its residents, which plays a strategic role in improving the morality of the community.

Design is a matter related to human life. Armstrong (2009)^[7] states that design is a personal activity that grows from an individual creative impulses. Nurhasan (2010)^[6] stated that the development of residential house design is largely influenced by social, economic, and physical factors. Pambudi and Krisna (2014)^[8] stated that the things that need to be considered in designing a house are the cost of construction and the price of building materials. Edwin (2016)^[9] states that Designing is the process of regulating everything before acting.

Hamzah (2013)^[10] stated that local wisdom is a source of knowledge that is dynamically organized, developed and passed on by certain populations that are integrated with their understanding of nature and the surrounding culture. Adyana (2012)^[11] stated that local wisdom is a local advantage that relies on values, norms, ethics, knowledge, technology, and behavior owned by a community group and institutions traditionally used to overcome life and life problems. Gobyah in Muhammad Ardi (2018)^[12] states that local wisdom is a product of past culture that should be continuously used as a handle for life.

Ahira (2011)^[13] states that the environment is everything around us in the form of living things, be it humans, animals, or plants. Muhammad Ardi, et al. (2018)^[12] stated that the environment is a living system in which there is human intervention in the order of the ecosystem. Adnani (2011)^[14] divides the environment into 3 parts, namely: biological environment, physical environment, and social environment. Muhammad Ardi, et al. (2018)^[12] stated that the environment consists of three important components, namely *the abiotic environment, biotic environment, and cultrural environment*. Yulius Nyerere in Mesaki (2011)^[15] states that "*In development, mainsthepurpos*". Bruntland (1987)^[16] stated that *sustainable development* is development to meet the needs of the current generation without reducing the right of future generations to meet their needs.

Methods

The research locations are Bone, Soppeng, and Wajo Regencies. The research population is the Bugis Tribe community in Bone, Soppeng, and Wajo Regencies. The research sample was selected by *the purposive sampling method*, namely the Bugis people

which well acquainted with the local wisdom of the Bugis Tribe related to residential houses. The size of the samples in each district are 100 people, thus the total sample are 300 people.

The research variables are as follows: (1) the development of a two-story minimalist type residential house design based on the local wisdom of the Bugis Tribe and environmentally sustainable, (2) the steps to implement the design, (3) supporting and inhibiting factors for the implementation of the design. The data collection instrument consists of three types, namely: (1) a questionnaire for the development of apparent design, (2) a questionnaire on the steps to implement design development and (3) a questionnaire on factors that support and hinder design development. Data collection was carried out by providing questionnaires to each sample in Bone, Soppeng, and Wajo Regencies. The analysis used is a qualitative descriptive analysis.

Research Results

Development of Two-Story Minimalist Type Bugis Residential House Design Based on Local Wisdom of the Bugis Tribe and Environmentally Sustainable

a. Based on the Position of the Sun

To find out the design of a two-story minimalist type house based on the local wisdom of the Bugis Tribe and environmentally sustainable on the position of the sun, the following is presented the frequency distribution of the development of a two-story minimalist type house design in Table 1.

Table 1. Development of Two-Story Minimalist Type Residential House Design Based on the Position of the Sun

No.	Description	Frequency	Percentage (%)	% Cumulative
1	Eastward	220	73,3	73,3
2	Westward	30	10	83,3
3	Northward	30	10	93,3
4	Southward	20	6,7	100
	Total	300	100	-

Based on the frequency distribution in Table 1, it can be understood that the front view shows that 73.3%, facing east, 10% facing west and north, and 6.7% facing south, respectively. On this basis, it can be concluded that the development of a two-story minimalist residential house design based on the local wisdom of the Bugis Tribe and environmentally sustainable is facing east. The eastward direction is interpreted as a good and sustainable life.

b. Based on Soil Contour

To find out the front design of a two-story minimalist type house based on the local wisdom of the Bugis Tribe, and environmentally sustainable based on the contours of the soil, the following is presented the frequency distribution of the development of a two-story minimalist type residential house design in Table 2.

Table 2. Development of Two-Story Minimalist Type Residential House Design Based on Soil Contours

No	Description	Frequency	Percentage (%)	% Cumulative
1	Towards the high	190	63,3	63,3
2	Towards the low	0	0	63.3
3	Towards the flat	110	36,7	100
4	Towards the sea/river	0	0	-
	Total	300	100	-

Based on the frequency distribution in Table 2, it can be understood that the front view of a two-story minimalist type house based on the local wisdom of the Bugis Tribe and environmentally sustainable is seen from the side of the soil contour, namely 63.3% facing the higher direction and 36.7% facing the flat direction. On this basis, it can be concluded that the development of a two-story minimalist house design is facing a higher direction and a flat direction. The higher and horizontal direction is interpreted as a house that always gets fortune from the God.

c. Based on Road Conditions

To find out the design of the front view of a two-story minimalist type house based on the local wisdom of the Bugis Tribe, and environmentally sustainable based on road conditions, the following is presented the frequency distribution of the development of the front view design of a two-story minimalist type house in Table 3.

Table 3. Development of Two-Story Minimalist Residential House Design Based On Road Conditions.

No	Description	Frequency	Percentage (%)	% Cumulative
1	To the main road	270	90	90
2	To the second way	30	10	100
3	To the hallway path	0	0	-
4	To the any direction	0	0	-
	Total	300	100	-

Based on the frequency distribution in Table 3, it can be understood that as many as 90% stated that the front view of a two-story minimalist type house based on the local wisdom of the Bugis Tribe, and environmentally sustainable is facing the main highway. On this basis, it can be concluded that the development of the front view design of a two-story minimalist type residential house is facing the main highway. A residential house facing the main highway is interpreted as a house that has a good fortune.

d. Roof Slope

To find out the development of the roof slope design of a two-story minimalist type residential house based on the local wisdom of the Bugis Tribe, and environmentally sustainable, the following is presented the distribution of the frequency of the roof slope design of a two-story minimalist type residential house in Table 4.

Table 4. Development of Two-Story Minimalist Residential House Design Based On Roof Slope

No	Description	Frequency	Percentage (%)	Cumulative Percentage
1	30 degrees	150	50	50
2	25 degrees	130	43,3	93,3
3	20 degrees	20	6,7	100
4	Minus 20 degrees	0	0	-
	Total	300	100	-

Based on the frequency distribution in Table 4, it can be seen that as many as 50% state that the roof slope design of a two-story minimalist type residential house based on the local wisdom of the Bugis Tribe, and environmentally sustainable is 30 degrees. As many as 43.3% stated 25 degrees. On this basis, it can be concluded that the development of the slope of the roof of a two-story minimalist type residential house is 25 to 30 degrees. The slope of the roof is interpreted as a house that is authoritative, safe and strong.

e. Roof Shape

To find out the development of the design of the roof shape of a two-story minimalist type residential house based on the local wisdom of the Bugis Tribe, and environmentally sustainable, the following is presented the frequency distribution of the development of the design of the roof shape of a two-story minimalist type residential house in Table 5.

Table 5. Development of Two-Story Minimalist Residential House Design Based On Roof Shape

No	Description	Frequency	Percentage (%)	Cumulative Percentage
1	Saddle	183	61	61
2	Shield	117	39	100
3	Saddle and shield	0	0	-
4	Any shape	0	0	-
	Total	300	100	-

Based on the frequency distribution in Table 5, it can be seen that the development of the design of the roof shape of a two-story minimalist type residential house based on the local wisdom of the Bugis Tribe, and environmentally sustainable, is 61% stated that it was in the form of a saddle or triangle. As many as 39% are in the form of shields or therapeutic ones. On this basis, it can be concluded that the development of the design of the roof shape of a two-story minimalist residential house is in the form of a saddle and shield. The symbol is interpreted as: (a) the prohibition of doing evil to fellow human beings even against other beings, and (b) a safe and peaceful life.

Steps to Implement the Development of Two-Story Minimalist House Design

a. Conducting Socialization

From the 300 samples analyzed, 283 (94.3%) respondents said that the first step to implementing design is to socialize. On this basis, it can be concluded that socializing to all relevant parties is the first step to implementing the development of a two-story minimalist residential design.

b. Explaining the Local Wisdom of the Bugis Tribe

Of the 300 samples analyzed, 295 (98.3%) respondents suggested that the second step to implement design is to explain the local wisdom of the Bugis Tribe in relation to residential houses. On this basis, it can be concluded that explaining the local wisdom of the Bugis Tribe in relation to residential houses to all relevant parties is the second step to implement the development of a two-story minimalist type residential design.

c. Explaining Healthy Houses

Of the 300 samples analyzed, 276 (92%) respondents suggested that the third step to implementing a design is to describe a healthy residential home. On this basis, it can be concluded that explaining a residential house to all relevant parties is the third step to implementing a two-story minimalist house design.

d. Collaborate With Relevant Stakeholders

Of the 300 samples analyzed, 288 (96%) respondents suggested that the fourth step to implementing the design is to collaborate with relevant stakeholders. On this basis, it can be concluded that collaborating with relevant stakeholders is the fourth step to implement the design of a two-story minimalist house.

Supporting Factors and Hindrances to the Development of Two-Story Minimalist Type Residential Design

a. Supporting Factors

a) Selling Price

Of the 300 samples analyzed, it turned out that 278 people (92.7%) suggested that the selling price of two-story minimalist houses is still affordable for the lower middle economic class. On this basis, it can be concluded that the selling price of the house is a supporting factor in the development of the design of a two-story minimalist residential house.

b) Availability of Spaces and Rooms that have Ventilation and Lighting

Of the 300 samples analyzed, it turned out that 295 people (98.3%) suggested that the room and room had good ventilation and lighting, so it was healthy to live in. On this basis, it can be concluded that the availability of ventilation and lighting in each space and room is a supporting factor in the development of the design of a two-story minimalist type house.

c) Availability of Land for Housing Development

Of the 300 samples analyzed, it turned out that 272 people (90.7%) suggested that the availability of land for the development of two-story minimalist houses was very possible. On this basis, it can be concluded that the availability of land for the development of two-story minimalist Bugis type residential houses based on the local wisdom of the Bugis Tribe and environmentally sustainable

is a supporting factor for the development of two-story minimalist type residential house designs.

d) Availability of Road Facilities, Clean Water, and Electricity

Of the 300 samples analyzed, it turned out that 288 people (96%) suggested that the availability of road facilities, clean water, and electricity for the development of two-story minimalist residential house designs was very available. On this basis, it can be concluded that the availability of road facilities, clean water, and electricity for the development of the design of two-story minimalist Bugis Tribe houses based on the local wisdom of the Bugis Tribe and environmentally sustainable is a supporting factor in the development of two-story minimalist house designs.

b. Inhibiting Factors

a) The Bugis Tribe has forgotten its Local Wisdom

Of the 300 samples analyzed, it turned out that 256 people (85.3%) said that the Bugis tribe had forgotten the local wisdom of their ancestors related to residential houses. On this basis, it can be concluded that the Bugis tribe no longer recognizes their local wisdom, so that building residential houses tends to be dominated by modern thinking and is a factor inhibiting the development of two-story minimalist house design.

b) Housing Planning Consultant

Of the 300 samples analyzed, it turned out that 264 people (88%) suggested that housing planning consultants did not understand and consider the local wisdom of the Bugis Tribe. Planning consultants design residential homes based on the idea of land profits and efficiency, so that aspects of local wisdom, home health, and sustainable environment are forgotten. On this basis, it can be concluded that planning consultants who do not understand the local wisdom of the Bugis Tribe are an inhibiting factor in the development of the design of two-story minimalist Bugis tribe houses.

c) Housing Developer

Of the 300 samples analyzed, it turned out that 271 people (90.3%) said *housing developers* did not understand and consider the local wisdom of the Bugis Tribe in designing and building residential houses. Developers only think about the advantages and efficiency aspects of land and buildings. Therefore, it can be concluded that Developers is a factor inhibiting the development of the design of two-story minimalist Bugis tribe houses.

Discussion

The results of the study show that the development of the front view design of a two-story minimalist type house based on the local wisdom of the Bugis Tribe, and environmentally sustainable from the aspect of the position of the sun is facing east. The east is interpreted: (a) it is the place where the sun rises which means the beginning of life, (b) the sunlight appears from the east and provides illumination to the universe which means a good source of life, and (c) it is a source of fortune for all humans. Thus the eastward is the best front of the house based on the philosophy of the Bugis Tribe.

The front of the house from the side of the ground contour is facing a higher and flatter place. The Bugis tribe will choose to face a higher direction and a flat direction. A higher and flat direction is interpreted as a house that has good fortune. In other words, the residents of the house will have good fortune, the more days get better. In addition, the Bugis tribe also understands that all humans before God are the same. The difference is perseverance, motivation, creativity, discipline, sincerity, and imagination possessed by humans.

The front of the house seen from the position of the road is facing the main highway. The Bugis tribe chooses to view the front of the house facing the main highway. This means that the house facing the main highway has a lot of fortune and is continuous. The roof slope

for a two-story minimalist house is 25 to 30 degrees. The Bugis tribe interprets that the slope of the roof is authoritative, strong and safe to live in. The roof of a two-story minimalist type residential house is in the form of a saddle and shield. Based on the local wisdom of the Bugis Tribe, the shape of the saddle and the shape of the saddle all the ends are tapering upwards, downwards, to the left, and to the right. The saddle and shield symbols symbolize safety, love, and peace. The Bugis tribe interprets it as a house full of safety and peace. A house with such a roof shape, its residents are safe, full of peace, love, and full of safety.

The supporting factors for the implementation of the development of a two-story minimalist house design based on the local wisdom of the Bugis Tribe, and environmentally sustainable are: (a) affordable house selling prices by the local economic community, (b) the development of house designs classified as healthy houses, (c) the availability of land for the development of houses and green open land, (d) the availability of road facilities, clean water, and electricity. These factors need to be maintained so that the application of minimalist residential design will give birth to healthy settlements. The inhibiting factors are: (a) Many Bugis tribes have abandoned their local wisdom, (b) planning consultants and *developers* do not understand the local wisdom of the Bugis tribe. Planner consultants and *developers* are profit-oriented. These factors need to be controlled.

Conclusion

The conclusions of this study are as follows:

- a) Development of a two-story minimalist type Bugis House Front Design based on the local wisdom of the Bugis Tribe, and environmentally sustainable: (a) seen from the position of the sun facing east, (b) seen from the contour of the ground facing a higher and flatter direction, (c) seen from the position of the road facing the main highway, (d) the slope of the roof is 25-30 degrees, and (e) the shape of the roof is the saddle and shield.
- b) The steps to implement design development are: (a) conducting socialization, (b) explaining the local wisdom of the Bugis Tribe related to residential houses, (c) explaining healthy residential houses, and (d) collaborating with relevant stakeholders.
- c) Supporting factors for the implementation of the development of the design of the appearance of a two-story minimalist Bugis Tribe house based on the local wisdom of the Bugis Tribe, and environmentally sustainable: (a) affordable selling price for the lower economic community, (b) the house design is relatively healthy, (c) land is available for the development of houses and green open land, (d) roads, clean water, and electricity are available. The inhibiting factors are as follows: (a) The Bugis tribe abandoned their local wisdom, (b) planning consultants and *developers* do not understand the local wisdom of the Bugis tribe.

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