

Development of Safe Two-Store Minimalist Type of Residential House Design Against COVID-19 Based on Local Wisdom of the Bugis Environmental Insight

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Abstract: The purpose of this study was to find (1) development of the design of supporting facilities, (2) stages of implementing the development of the design of supporting facilities, (3) factors supporting and inhibiting development of the design of supporting facilities for minimalist type residences (types 35, 40 and 45) with two floors. safe against COVID-19, based on local wisdom of the Bugis Tribe and environmentally friendly. This is a survey research, located in Bone, Soppeng, and Wajo Regencies. Respondents in each district were 100 people selected by purposive sampling method, so the number of samples was 300 people. Research variables are: Development of the design of supporting facilities, Stages developing design of the supporting facilities, and factors supporting and inhibiting the implementation of design of the supporting facilities. Data collection is done by giving a questionnaire to the sample. Analysis used is descriptive qualitative analysis, after that it is continued with design development. The results showed: (1) development of a design for supporting facilities for a minimalist two-story Bugis house that was safe against COVID-19, based on the local wisdom of Bugis and with an environmental perspective, was as follows: (a) location of the septic tank construction was on the home page. the front, the shape of the construction is rectangular, wall construction is bricks, the cover is repeated concrete equipped with a seepage system, (b) location of the drainage for the drainage of dirty water is on the side and back of the house, construction form is an open channel, the drainage construction is a pair bricks, (c) location of the construction the dirty water reservoir is on the back, shape of the construction is rectangular, and construction of the walls is a pair of bricks, (d) location of the temporary garbage disposal is in front of the house, shape of the construction is rectangular., concrete masonry construction; (2) steps for implementing design development are: (a) conducting socialization, (b) explaining local wisdom related to housing, the cost of supporting facilities, and (c) cooperating with various parties; (3) supporting factors are: (a) cheap construction costs, (b) the house is classified as healthy, (c) does not cause environmental pollution, (d) availability of the house yard.

Keywords: Residential House, Minimalist Type, Design, Local Wisdom, COVID-19

1. Introduction

Population growth and increase automatically have an impact on the provision of healthy, safe, and comfortable housing. Law Number 32 of (2009) explains that in building a residential house, it is necessary to utilize the environment according to needs and maintain the environment so that it remains sustainable [1]. Trainer states that in building, do not

use natural resources excessively, natural resources are used according to needs [2]. Muhammad Ardi states that residential houses should have a beautiful design, safe, efficient construction, have social, cultural values, and are a place for families to take shelter, rest, and joke [3]. Culture or local wisdom cannot be separated from the construction or design of residential houses. Marfai states that local wisdom is another form of environmental ethics, namely a set of

knowledge obtained through the process and learning of a group of people [4].

The construction of residential houses by developers, as well as those built by the Bugis people themselves continues, development does not pay attention to the local wisdom of the Bugis, tackling COVID-19, and sustainable environmental aspects (July Survey, 2018). The development of floor plans, looks, and supporting facilities for two-story minimalist type houses (types 35, 40 and 45) based on the local wisdom of the Bugis Tribe with an environmental perspective is not yet available to planning consultants, residential developers, and other stakeholders, while market demand (January 2019 survey). The descriptions and phenomena previously stated are the importance of this research.

The research problems are as follows:

- (1) how is the development of a design for supporting facilities for a minimalist two-story Bugis house that is safe against COVID-19, based on local wisdom of the Bugis tribe, and environmentally friendly?
- (2) what are the stages of implementing the design of supporting facilities for a minimalist two-story Bugis house that is safe against COVID-19, based on local wisdom of the Bugis tribe, and environmentally friendly?
- (3) what are the factors that support and hinder the development of the design of supporting facilities for a minimalist, two-story Bugis house that is safe against COVID-19, based on local wisdom of the Bugis tribe, and environmentally friendly?

2. Literature Review

In Law No. 4 of 1992 it is stated that a house is a building that functions as a place to live or a residence and a means of fostering a family [5]. Muhammad Ardi states that a residence is a residence that meets technical, social, aesthetic, and decent living conditions [3]. Muhammad Ardi states that the house is a place where humans live, carry out the socialization process, interact socially, introduce culture and are part of the settlement [6].

Muhammad Ardi states that to build a residential house requires environmental insight, a strategy is needed that can accommodate human aspirations and desires, while still paying attention to a sustainable environment [3]. In Wikipedia it is stated that a residential house has an entrance in the form of a door, has a floor, bedroom, bathroom, WC, dining room, kitchen, family room, living room, and other facilities. Residential houses have a variety of models. Currently, residential houses also have standard sizes, such as type 36 houses, type 45 houses, type 54 houses Nurhasan, Indrawati and Riza state that the house is the main place to increase the potential of human resources for all its residents, which plays a strategic role in improving the morality of the ummah [7].

Armstrong states that design is a personal activity that grows from the creative impulse of an individual [8].

Nurhasan, states that the development of residential design is largely influenced by social, economic, physical factors [7]. Pambudi and Krisna state that things that need to be considered in designing a house are construction costs and building material prices [9]. Edwin states that design is the process of organizing everything before acting [10].

Muhammad Ardi states that traditional wisdom is local culture that brings good luck and is used as a reference for doing something [6]. Hamzah states that local wisdom is a source of knowledge that is integrated with their understanding of the surrounding nature and culture [11]. Adyana basically states that local wisdom is a local advantage that relies on values, norms, ethics, knowledge, technology, and behavior possessed by a community group and is traditionally institutionalized that is used to overcome life and life problems [12].

Ahmadi and Ahira state that the environment is everything that is around us in the form of living things, be it humans, animals, or plants [13, 14]. Muhammad Ardi states that the environment is a living system in which there is human intervention in the order of the ecosystem [5]. Ahira divides the living environment into two parts, namely: the natural environment and the artificial environment [14].

Adnani and Muhammad Ardi divide the environment into 3 parts, namely: the biological environment, the physical environment, and the social environment [15, 6].

3. Research Methods

This type of research is classified as survey research. The research locations are three regencies, selected by purposive sampling method, namely: Bone, Soppeng, and Wajo Regencies. These three districts have strong local wisdom related to housing. The research population is the Bugis people in the districts of Bone, Soppeng, and Wajo. The sampling method used is purposive sampling method. The sample size for each district is 100 people. Thus the total sample is 300 people.

The research variables are as follows:

- (1) development of a design for supporting facilities for a minimalist, two-story residential house that is safe against COVID-19, based on local wisdom of the Bugis tribe, and environmentally friendly,
- (2) stages of implementing design development,
- (3) supporting factors and impediments to design development.

The data collection instruments were questionnaires:

- (1) development of supporting facilities design,
- (2) stages of implementation of supporting facilities design development, and,
- (3) factors that support and hinder the development of supporting facilities design for minimalist two-story residential houses based on local wisdom of the Bugis Tribe.

Data was collected by giving three types of questionnaires to each member of the sample to be answered. The analysis used is descriptive qualitative analysis.

4. Research Results

4.1. Development of Supporting Facilities Design

4.1.1. Development of Public Bathroom and (WC) Layout Designs

The results of the descriptive analysis of the development of the design for the layout of the public bathroom (WC) for a minimalist two-story Bugis house, according to the local wisdom of the Bugis, safe against COVID-19, and environmentally friendly, show that the location of the public bathroom (WC) is in the middle, left side or right side.

4.1.2. Personal Bathroom (WC) Layout Design Development

The results of the descriptive analysis of the development of the design of the location of the private bathroom and (WC) for a minimalist two-story Bugis house, according to the local wisdom of the Bugis, safe against COVID-19, and environmentally friendly, show that the bathroom (WC) is located in each bedroom with separate construction.

4.1.3. Development of Septic Tank Site Design and Construction

The results of the descriptive analysis of the development of the design for the layout of the septic tank for the minimalist two-story Bugis house, in accordance with the local wisdom of the Bugis, safe against COVID-19, and environmentally friendly, show that the development of the septic tank for the minimalist type of two-story residential house is on the home page, front, right or left. Construction is masonry concrete, equipped with permeation system.

4.1.4. Development of Construction Design for Dirty Water and Rainwater Sewerage

The results of the descriptive analysis of the development of the design of the sewerage and rainwater for a minimalist two-story Bugis house, in accordance with the local wisdom of the Bugis, safe against COVID-19, and environmentally sound, show that the development of a minimalist type of sewerage for a residential house is two floors is a pair of red stone open model.

4.1.5. Development of Location Design and Construction of Temporary Waste Disposal Sites (TPS)

The results of the descriptive analysis of the development of the layout design and construction of a minimalist two-story Bugis residential landfill, according to the local wisdom of the Bugis, safe against COVID-19, and environmentally friendly, show that the development of a minimalist type of residential TPS construction location design two-story is on the front page of the house. Construction is a concrete masonry and the shape is a rectangle.

4.1.6. Development of Location Design and Construction of Dirty Water Reservoirs

The results of the descriptive analysis of the development of the design of the location and the dirty water reservoir for a minimalist two-story Bugis house, according to the local

wisdom of the Bugis, safe against COVID-19, and environmentally friendly, show that the development of the design for the construction of the dirty water reservoir is on the home page, back. The construction of the tub is concrete masonry.

4.2. Stages of Implementation of Supporting Facilities Design Development

The results of the descriptive analysis show that the stages of implementing the design of supporting facilities for a minimalist type of two-story residential house based on local wisdom of the Bugis Tribe, safe against COVID-19, and environmentally friendly are:

- (a) socializing,
- (b) explaining the local wisdom of the Bugis,
- (c) explain construction costs,
- (d) explain healthy supporting facilities, and
- (e) cooperate.

The steps as mentioned earlier are to make it easier and increase the insight of planning consultants, contractors, and the Bugis to implement the design development of supporting facilities for minimalist two-story residential houses in a tangible form.

4.3. Factors that Support and Barrier to Design Development

The results of the descriptive analysis show that the supporting factors for developing the design of supporting facilities for a minimalist, two-story type residence based on local wisdom of the Bugis Tribe, safe against COVID-19, and environmentally friendly are:

- (a) affordable construction costs,
- (b) the house is classified as healthy,
- (c) does not cause environmental pollution, and,
- (d) there is sufficient home page.

The inhibiting factors are:

- (a) planning consultants and implementing contractors do not understand the local wisdom of the Bugis tribe related to housing,
- (b) knowledge, attitudes, motivation, and low public awareness about environmental pollution.

5. Discussion

The form of development of the design of the septic tank construction is rectangular. The construction of the walls is red masonry and the cover is reinforced concrete. Development of the design of a septic tank equipped with a permeation system. From a technical and environmental point of view, the development of septic tank construction is very safe, durable, easy to maintain, and easy to control. The construction of the septic tank will not be full of fecal water because of the permeation system that functions to deliver fecal water into the soil body quickly. In terms of local wisdom of the Bugis, the rectangular shape means the cardinal directions, namely east, west, north and south. The

rectangular shape is also interpreted as earth, water, fire, and wind are an inseparable unit.

The development of the design of the location and form of the sewerage construction is on the back. The construction is a pair of red stones. The form of construction is an open channel. In terms of construction, COVID-19 control, and environmental sustainability of the construction are durable, easy to clean, construction costs are affordable, and disease predators are difficult to grow.

The development of the layout design and construction of the dirty water reservoir is on the side of the house or on the back of the house. The shape of the construction is rectangular. The construction wall, is a pair of red stone. The construction cover is reinforced concrete. Disposal of household dirty water will not cause muddy on the home page, does not cause unpleasant odors. This is because all the dirty water flows through the dirty water channel and goes straight into the tub. Dirty water in the tub immediately enters the ground through the bottom of the tub that is not paired.

The development of the layout design and construction of a temporary garbage dump (TPS) is on the front yard of the house. The form of construction is concrete stone construction. Garbage that has been disposed of at the TPS makes it easier for municipal waste officers to access and collect it. The construction and shape is also very safe. Concrete masonry construction will be durable, easy to control, easy to maintain and easy to clean.

Conducting socialization, explaining the local wisdom of the Bugis tribe, explaining the cost of supporting facilities for a minimalist two-story type of residence, explaining healthy supporting facilities, and cooperating are steps that must be taken to implement the development of supporting facilities for a two-story minimalist type of residence. These five steps are very important and should not be done separately.

Supporting factors should be maintained, so that in the future residential planning consultants, residential contractors, and other stakeholders pay attention to these aspects in designing and constructing residential houses. The inhibiting factor should be minimized, thus accelerating the implementation of the design among the Bugis people. Construction of good supporting facilities, creating a healthy and sustainable housing or settlement environment. The residential environment will provide its residents with fresh air, beauty and comfort.

Planning consultants, implementing contractors, public knowledge about environmental pollution, community attitudes towards environmental pollution, community motivation to protect the environment, and public concern for the environment are the inhibiting factors for implementing the design suggestions for supporting minimalist type two-story houses. This inhibiting factor should be controlled.

The results of this study are supported by previous research conducted by Ardi et al about exploring the values of local wisdom of the Bugis tribe, in building houses, which are associated with the current situation of the COVID-19 Pandemic [16].

6. Conclusion

- (1) Development of a design for supporting facilities for a minimalist, two-story Bugis residence that is safe against COVID-19, based on Bugis local wisdom and environmentally sound, are:
 - (a) the location of the septic tank construction on the front yard of the house, the construction is a pair of concrete stones, and the shape of the rectangular construction,
 - (b) the location of the drainage for the drainage of dirty water is on the side and back of the house, the construction is a pair of red stones, the form of construction is an open channel,
 - (c) the location of the construction of the dirty water reservoir is on the back, the construction is masonry concrete, the shape of construction is rectangular,
 - (d) the location of the temporary garbage dump is on the front yard of the house, the construction of masonry is concrete, and the shape of the construction is rectangular.
- (2) Steps for implementing design development:
 - (a) conducting socialization,
 - (b) explaining local wisdom related to residential houses,
 - (c) explaining the cost of supporting facilities,
 - (d) explaining about healthy supporting facilities, and
 - (e) cooperating with various parties.
- (3) Factors supporting the development of the design:
 - (a) low construction costs,
 - (b) the house is classified as healthy,
 - (c) does not cause environmental pollution, and,
 - (d) the availability of the home page.

The inhibiting factors are:

 - (a) planning consultant,
 - (b) implementing contractor,
 - (c) community knowledge about environmental pollution,
 - (d) community attitude towards environmental pollution, and
 - (e) community motivation to protect the environment, and community concern for the environment.

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References

- [1] Law of the Republic of Indonesia Number 32 of 2009 concerning Environmental Protection and Management.
- [2] Trainer, Ted. (2011). *The Radical Implication of a Zero Growth Economy* 1 (<http://rwer.wordpress.com/2011/09/06/rwer-issue-57-Trainer/>, diakses 15 September 2018).
- [3] Muhammad Ardi, Bakhrani A. Rauf, dan Mithen. (2017). *Residential Design Based on Local Wisdom of the Bugis Tribe with Environmental Insight*. Makassar: Badan Penerbit UNM.
- [4] Marfai. (2012). *Introduction to Environmental Ethics and Local Wisdom*. Yogyakarta: UGM Press.
- [5] *Law of the Republic of Indonesia No. 4 Years (1992) Regarding Housing and Settlements*.
- [6] Muhammad Ardi, Mithen, Bakhrani A. Rauf, dan Faizal Amir. (2018). *The Design of a Residential House Based on the Local Wisdom of the Bugis Tribe with Environmental Insight*. Makassar: Badan Penerbit UNM.
- [7] Nurhasan, Indrawati dan Riza Zahrul Islam. (2010). "Simple Healthy Home Design Approach (RS Sehat) and Its Environment Based on Islamic Architecture." Laporan Penelitian. Solo: Universitas Muhamadiyah Solo.
- [8] Armstrong, Helen. (2009) *Graphic Design Theory Reading From The Field*. (Terjemahan: Indrajaya, Erastus Hans). Yogyakarta: Penerbit Andi.
- [9] Pambudi, Gandi Bagus dan Krisna Dwi Handayani. (2014). *Analysis of the Conformity of Home Design Against the Greenship Home Concept in Middle to Upper Housing in Gresik City*. https://drive.google.com/file/d/0B3veF_xJ1onYMWFBY29TN29hd1E/view. Diakses 13 Mei 2019.
- [10] Edwin, dkk. (2016). "Residential Design." https://www.academia.edu/28635798/perancangan_rumah_tinggal. Diakses 13 Mei 2019.
- [11] Hamzah, M. (2013). *Environmental Education, A Little Introductory Insight*. Bandung: Refika Aditama.
- [12] Adyana, P. (2012). The Discourse of Tembang Macapat as a Disclosure of the Cognition System and Local Wisdom of the Javanese Ethnic. *Publikasiilmiah.ums.ac.id. Volume 2. No. 22. Desember 2012*.
- [13] Ahmadi. (2012). *Social Psychology*. Jakarta: Rineka Cipta.
- [14] Ahira, Anne. (2011). *Residential Environmental Health*. (www.anneahira.com/health-environment-permukiman.htm, diakses 22 April 2019).
- [15] Adnani. (2011). *Public Health Sciences. Mold 1*. Yogyakarta: Nuha Medika.
- [16] Ardi Muhammad, et al. (2021). Development of Safe Two-Store Minimalist Type of Residential House Against COVID-19, Based on Local Wisdom of the Bugis, and Environmental Insight. *International Journal of Architecture, Arts and Applications* 2021; 7 (3): 56-61.