



Balinese Traditional House Architecture in Era 4.0 in Bukian

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Abstract—Architecture is the art of designing buildings which are a microcosm of the universe. Traditional Balinese architecture is an embodiment of local wisdom in Bali which is inherited from generation to generation. In traditional Balinese architecture there is harmony between humans and creators, humans with humans and humans with nature. The background of this research is to identify the traditional Balinese architecture residence at 4.0 in Bukian. The purpose of this research is to find a formula or benchmark in building a traditional house using International Atropometry. This makes it easier to build traditional houses due to the lack of Undagi in Bali. The method used is a quantitative method by making a sample house master plan to identify it with a flow chart. The results or conclusions of the natah pattern use the Tri Hita Karana concept, the barrier or floor uses the 1,0,8,0,6,0,4,0,2 approach. The approach in building a traditional house is $SL = O + R + J + U$.

Keywords: Architecture; Atropometry; $SL = O + R + J + U$.

I. Introduction

Architecture is the embodiment of the culture of the Hindu community in Bali, as a reference for achieving harmony and integration, both for humans, the environment, and the universe. On the other hand, factors such as socio-economic, socio-cultural, and socio-political life are no less important in underpinning the embodiment of traditional Balinese architecture. Traditional Balinese architecture can be interpreted as a spatial arrangement that accommodates the lives of Balinese people who have developed from generation to generation with all the rules inherited from ancient times to the present. Traditional Balinese architecture is inseparable from the existence of Hindu manuscripts and the rules in designing Balinese building layouts. In the world of design, the concept of globalism refers to the optimization of sensory functions such as eyes, ears, skin and nose. This concept prioritizes efficiency and productivity which is in line with the

globalization concept. To meet these conditions, the consequences of architectural forms that are functional, rational, standardized, straightforward, paying attention to local civilization/architecture and meeting the needs of residents are alternatives in developing architectural designs in accordance with the demands of today's progress (Komang & Sari, 2020)

Population growth and the development of the economy level in this global era indirectly have a very large impact on the development of architecture in Bali. As a tourist destination by domestic and foreign tourists, architecture in Bali has developed and is difficult to control. The entry of various foreign elements will eventually dominate the local Balinese architecture. This has begun to be seen from the emergence of various contemporary buildings with architecture that combines various styles to become the center of attention. (Praganingrum & Suryatmaja, 2017)

The difference between acculturation of dominance and integration from an architectural point of view lies in how local architecture is able to

survive and absorb foreign elements only to strengthen the local culture, not the other way around being eroded and eventually overthrown by foreign domination. (Praganingrum & Suryatmaja, 2017)

Residential layouts of traditional Balinese buildings in terms of people's residences in Bali use the concepts of Tri Mandala and Tri Hita Karana which are sourced from Asta Kosala-Kosali and Asta Bhumi lontars. This creates harmony as well as a comprehensive integration between the microcosm (*Bhuwana Alit*) and the macrocosm (*Bhuwana Agung*) based on the spatial development of religious social life, as a way of life for the Hindu community in Bali. This view is embodied in Balinese art and culture, especially in the complex layout of traditional Balinese buildings and arranged according to the texts of *Asta Kosala Kosali* and *Asta Bhumi*. (Kolang & Sari, 2020)

The purpose of this research is to find a formula or benchmark in building a traditional house using International Atropometry. This makes it easier to build traditional houses due to the lack of *Undagi* in Bali.

II. Methods

The location of this research is in Bukian Village, Payangan District, Gianyar Regency. The focus of this research is traditional houses in Bukian Village in Era 4.0 with special standards to get a dynamic facade between buildings in the residential yard environment and meet Atropometry standards on an international scale. (Suky luxiana, 2019).

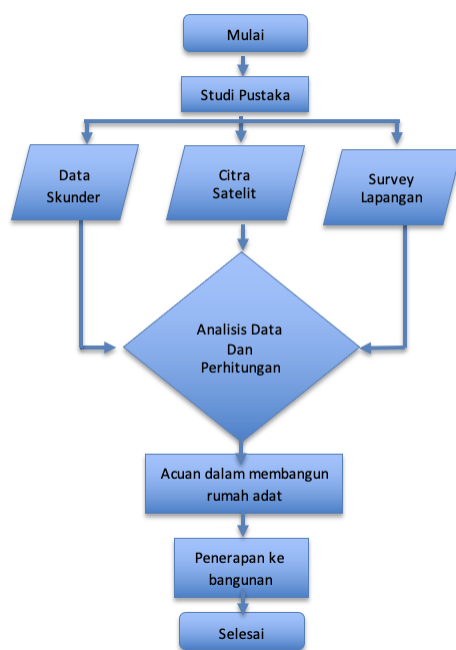


Figure 1. Roadmap

III. Result and Discussion

Traditional Balinese architecture was built following the layout, and the building with the concept of Asta Kosala Kosali. This is one of the concepts used in structuring a house or building technique based on the owner of sacred human anatomy (anthropometry). This concept is still used in the traditional construction of residential houses in Bali in accordance with the philosophical, ethical, and ritual foundations regarding the embodiment of the conception, choosing land, good day (*dewasa ayu*) to build a house, as well as a ceremony (*yadnya*) in its development. The area of building land in Bukian Village is father land. Village is a plot of land given by the local custom of the village where the community lives which measures the extent to which it is determined by the level of color (caste), position and *dadia* (group/community of residents in numbers. (Parwata et al. , 2017)

When in Bukian this architecture is in harmony with Asta Kosala Kosali. This architecture does not conflict with local customs and customs. This architecture is indeed a bit expensive because it emphasizes something or points so that it forces waste in terms of structure. But this architecture is the most popular today because it produces a graceful form and a very attractive appearance. Hopefully Traditional Balinese architecture can be accepted in the International World. (Suky luxiana, 2019). Here is the existing example of traditional house in Bukian.



Figure 2. Lay-Out Traditional House in Desa Bukian

Sanggah

Pamerajan comes from the word: *Sanggah*, meaning *Sanggar* = holy place; *Pamerajan* comes from *Praja* = family. So *Sanggah Pamerajan* means = a sacred place for a certain family. People call it in short: *Sanggah*, or *Merajan*. This does not mean that *Sanggah* is for the Jaba people, while *Merajan* is for the Triwangsa. This one has been a mistake in society for a long time, it needs to be corrected. *Sanggah* Being One of the must have in Balinese Traditional Architecture. (suky luxiana, 2019)

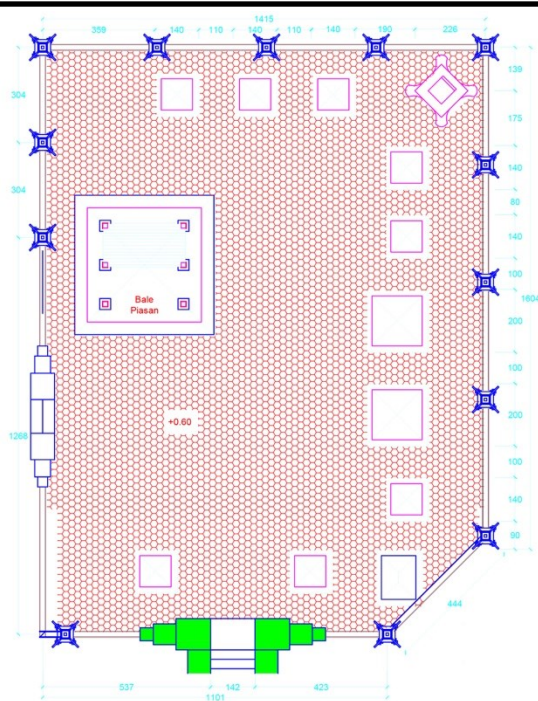


Figure 3. Sanggah Plan



Figure 4. Sanggah

In this example house is Sanggah / Merjana Gede which consists of Padmasana, Piasan, Rong Telu, Gedong Paras, Pengawangan batur, Pengawangan Batu karu, Pengawangan Batu Karu, Hyang Guru, Dewa Hyang, and Apit Lawang.

Bale Daja/Gedong/Bale Gede

Bale daja Bali is a bale that follows the placement according to the direction of the wind in the mention of the local community. *Kaja* or *daja* is a higher area (mountain); for South Bali is the designation for the north and for North Bali is the designation for the south. The function of the Balinese *bale daja* tradition is the initial function which is only a bedplace. Other traditional functions are also found as a birthing room, a bedroom for girls and a space for storing heirlooms (*gedong simpan*). (suky luxiana, 2019).

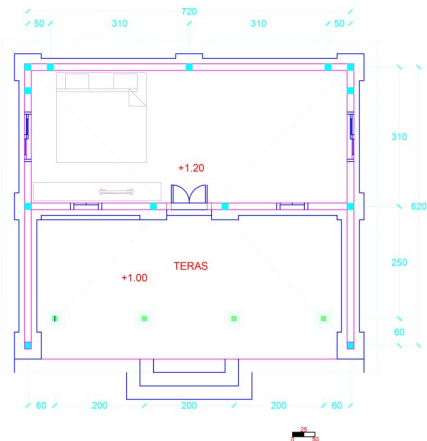


Figure 5. Bale Daja Plan



Figure 6. Bale Daja

Bale Dangin/Bale Sari/Bale Sakenem

Generally, the "sakenem" Sudra caste building is owned by the residents, according to the land area given by the traditional village. Each occupant on the land has responsibilities towards their traditional village such as: participating in and constructing and maintaining public buildings owned by the community village, arrange ceremonies related to customary activities and several activities that residents must obey. The residents who own the "sakenem" building are of course smaller in size than the residents who own the "sakutus" or "sakaroras" buildings. And if they are forced to build a "sakutus" or "sakaroras" building in their yard, and the layout of the building is crowded, it is uncomfortable and there is even a shift in values, spatial and spatial planning in Balinese architecture. (Parwata et al., 2017).

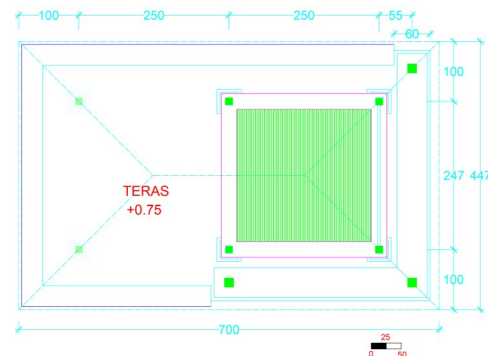


Figure 7. Bale Dangin Plan



Figure 8. Bale Dangin

Bale Dauh

Bale Dauh is located in the western part (Dauh natah umah), and is often referred to as Bale Loji, and Tiang Sanga. The function of this Bale Dauh is for a place to receive guests and is also used as a bed for teenagers or young people. The facilities in this Bale Dauh building are 1 bale - bale which is located on the inside. The shape of the Bale Dauh building is rectangular, and uses saka or poles made of wood. If there are 6 poles, it is called sakenem, if there are 8 it is called Sakutus / Astasari, and if there are 9 poles, it is called Sangasari. The Bale Dauh building is a residential house that uses rocks with a lower floor than Bale Dangin and Bale Meten. (suky luxiana, 2019).

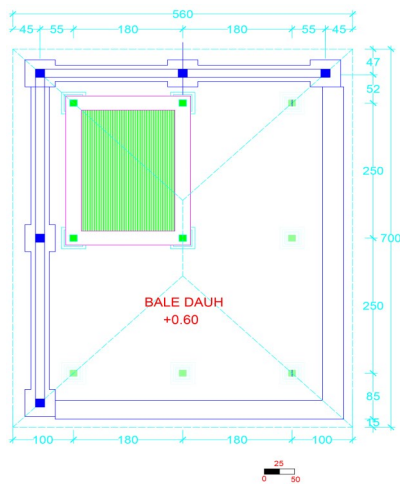


Figure 9. Bale Dauh Plan



Figure 10. Bale Dauh

Bale Delod

Bale Delod which is located on the south side of the yard. Its function is as a place to receive guests, traditional activities, or a place to place the bodies of family members who will be cremated. In addition, this bale also functions as a place to place offerings or offerings before carrying out *yadnya*, as a place to carry out *manusa yadnya*, such as *otonan*, tooth filling, and wedding blessing ceremonies, so it is often referred to as *Bale Payadnyan*. (Suky luxiana, 2019)

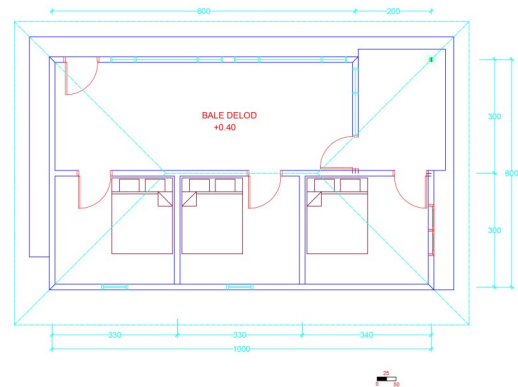


Figure 11. Bale Delod Plan



Figure 12. Bale Delod

Bale Delod has been undergoing renovations because the old building is already porous on the brick walls. Renovation while maintaining the old size leads to the use of modern materials consisting of 1 living room and 3 beds.

Paon/Kitchen

The kitchen is a domestic space in the residence that accommodates the activity of processing and providing food for family needs. However, in the context of the tradition of living, the kitchen can also have a symbolic meaning of a certain ethnic group. The kitchen, or paon in the terms of the traditional *Balinese Aga* community in Central Bali, does not only function as a domestic space, but also becomes one of the spatial forms of embodiment of the belief system adopted by the community. (Agusintadewi, 2018).

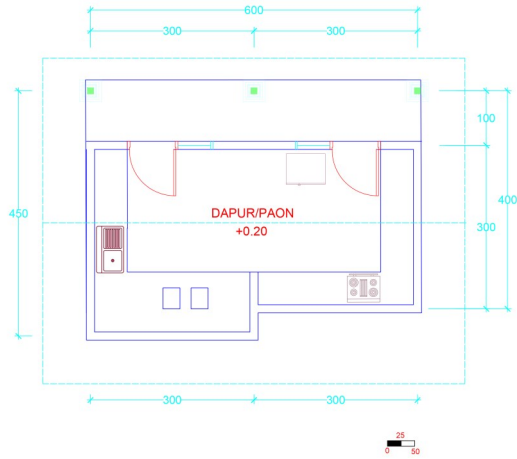


Figure 13. Paon Plan



Figure 14. Paon

Offering Place /Mejejaitan Place

Banten/ offerings is a means for Hindus to connect with God. Banten consists of several other supporting sections, including; fruits, snacks (jaje Bali), and jejaitan. Banten is also identified with women by most people. This refers to the process of making banten which is mostly done by women, so a mejejaitan place is needed. (Bali et al., n.d.)

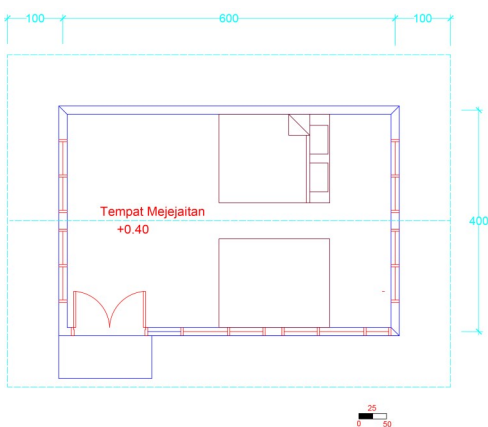


Figure 15. Offering Place /Mejejaitan Place Plan



Figure 16. Offering Place /Mejejaitan Place

Jineng/Krumpu

The unit of a *Jineng* building is located in the southeastern part of the *natan umah*, or often referred to as *Krumpu*, or for those who think a slightly larger size is called *Jineng*.(suky luxiana, 2019).



Figure 17. Krumpu

IV. Conclusion

In the distribution or land use using the *Tri Hita Karana* concept.

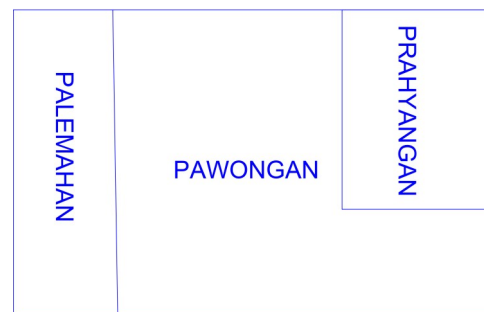


Figure 18. Natah Boundary / Floor Height



Figure 19. Boundary Height Building Facades use the concept.

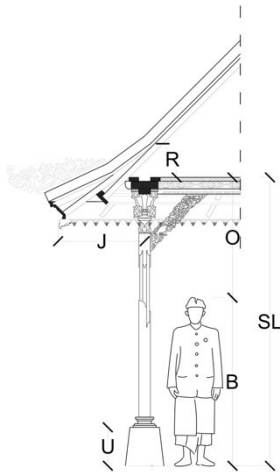


Figure 20. Atropometri

$$SL = O + R + J + U$$

SL = height of the symbol

B = Height of person

O = Distance between person and symbol

R = Tilt Angle

J = Push out to the bottom

U = Joint Height

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