SUSTAINABILITY OF TRADITIONAL ARCHITECTURE THROUGH TRANSFORMATION IN CONTEMPORARY BALINESE HOUSING

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ABSTRACT

Balinese architecture is a written knowledge which date back to 14th century, which available in some manuscripts. Those manuscripts written on palm leaves which is called lontar. Some lontars contain Balinese architecture are Asta Kosala-Kosali, Asta Bumi, Tutur Gong Besi, etc. Those lontars have been providing Balinese guidance regarding architecture and 'how-to' construction especially related to residential buildings. Balinese still believe that those lontars should followed when build a house, but due to high economic cost & land price, it's become more difficult to implement Balinese Architecture, especially in modern housing. This paper try to suggest some adaptation of Balinese Architecture principles in Balinese modern housing.

As a result, there have been changes in the concept of housing or residential houses of the Balinese people. The concept and procedures for the construction of traditional Balinese residences are guided by Asta Kosala-Kosali, which includes procedures for selecting land and materials, building dimensions, construction processes and accompanying rituals. The variety of residences in Bali today basically maintains some of the identity of traditional architectural element with some transformations, so that there is a sustainability of traditional Balinese architecture in today's residences, although not as a whole. Transformations that occur mainly in the shape of buildings shape, construction systems, and building materials.

Keywords: *balinese architecture, modern housing, sustainable*

1. INTRODUCTION

Bali, a tropical island across the south of the equator, is famous throughout the world with its natural beauty and unique culture. The community performs and celebrates its culture in every aspect of life. This cultural process then becomes a strongly attached Balinese identity. The easiest and most visible identification of this identity is in the housing or residential building of the Balinese people. Traditional Balinese housings are built in such a way using rules and architectural concepts based on local values, such as: Tri Hita Karana, Asta Kosala-Kosali, Asta Bumi and others.

The embodiment of culture also occurs in formal regional development, especially in the field of architecture. Cultural emphasis appears in several regulations of Bali Province, as stated in Bali Provincial Regulation Number 16 of 2009 about Regional Spatial Plans, and Bali Provincial Regulation Number 5 of 2005 about Building Architecture Requirements.

The regional regulation becomes legitimacy in maintaining the cultural identity of Balinese architecture in development in Bali. Bali Provincial Regulation Number 5

of 2005 about Building Architecture Requirements expressly requires that buildings must have the pattern and character of traditional Balinese architecture in general as well as local architectural patterns and that are harmonious and integrated with the environment.

Along with efforts to strengthen traditional architecture, Bali also faces challenges in the form of cultural "invasions" and high land prices as a result of tourism booming. This challenge has an impact on contemporary housing development patterns that tend to move away from traditional Balinese architectural values, thus moving away from their traditional identity. Is there any sustainability of traditional architecture that still remains and to what extent has it undergone transformation in contemporary housing of the Balinese community? This paper tries to discuss the issue.

2. RESEARCH METODOLOGY

This paper research approach is a qualitative approach with descriptive analysis methods. The data was obtained through internet searches which were then compared with literature studies on Traditional Balinese Architecture to obtain the sustainability of Traditional Balinese Architecture in contemporary Balinese housing.

3. LITERATUR REVIEW

Traditional Balinese architecture is cultural and natural architecture. The realization of TBA starting from prehistoric times until now has faced many challenges both from nature and from outside cultures. In essence, the principles of TBA are derived from the philosophy of Hinduism which is abstracted and understood and lived and implemented into the philosophy of local culture and local regions and buildings.

a. Traditional Balinese Architecture (TBA) Concept

Broadly speaking, the cultural philosophy in question includes aspects of Divinity (*parhyangan*), human aspects (*pawongan*), and aspects of the environment or nature (*palemahan*). These three aspects must not stand alone, but there must be harmony and balance between the *Bhuana Agung* (macrocosm) and *Bhuana Alit* (microcosm) as well as the harmony in diversity which is the philosophical development. The harmony and harmony between these three aspects is called *Tri Hita Karana* (Uthama, 2015).

The concept of *Tri Hita Karana* underlies the realization of the harmony of the cosmos of the *Bhuana Agung* and *the Bhuana Alit*. At the village level and banjar, *parhyangan* is identified with Pura *Kahyangan Tiga* and Pura Banjar, *pawongan* is identified with villagers and banjar residents, while *palemahan* is identified as village area and *banjar* area. In residential level, *parhyangan* is identified as a *sanggah pamerajan* (holy place), *pawongan* is identified as a resident of the house, and *palemahan* is identified as a yard (Dwijendra, 2008).

The concept of spatial planning and zoning in Bali is derived from the concept of *Sanga Mandala* which was born from the concept of nine manifestations of God, namely *Dewata Nawa Sangga* which spreads in eight cardinal directions plus one in the middle in maintaining the balance of the universe. The concept of *Sanga Mandala* is a consideration in the zoning of activities and the layout of buildings at TBA. The main activities that require tranquility are placed in the *Utamaning Utama* area, and activities that are considered dirty are placed in the *Nistaning Nista* area, while the activities in between are placed in the middle or we know the *Natah* pattern (Dwijendra, 2008).

b. Traditional Balinese Residential Patterns

The concept of Sanga Mandala also applies to the scale of traditional Balinese residences or residential houses. A traditional residential yard is divided into 9 main sections. The *kaja-kangin* zone is designated as a sacred area (*parhyangan*), the middle zone for *pawongan*, residential spaces as well as the nista zone, *kauh-kelod*, for services called *palemahan*.

The arrangement of the space in the *madya* zone in the middle is *natah* as a central courtyard surrounded by buildings. *Bale Meten* is located in the direction of *kaja* for bedroom, *bale sumanggen* is located in the direction of *kangin* for ceremonies and multipurpose halls. *Paon* is located *kelod* or *kelod kauh*, for the kitchen and *bele dauh*. *Jineng* (granary) is located in the kauh direction. If the *kauh* side is occupied by *a bale dauh* which is used for sleeping space, the jineng as a barn occupies the *kelod-kauh* zone or *kelod-kangin*. Wells and baths are placed in *kaja-kauh*. The part of the yard behind the house is called *teba*, its function is to place livestock and plants. (Gelebet, 1986).

c. Bentuk Bangunan dan Konstruksi Arsitektur Tradisional Bali

The construction in TBA has elastic properties that have very elastic properties that have earthquake-resistant strength, because the construction system uses a peg (lait) system called the *wadon lanang* system, also strengthened by a rope bonding system. Construction in TBA buildings is the application of a structural system with various considerations of the properties of materials and logic that depend in the forces of nature. The structural system used is a frame structure system and the wall/wall only functions as a baffle. TBA building construction not only functions as a receiver of style / load but also functions as an aesthetic element in the building. Between the bodies of the building are connected with joints. (Uthama, 2015).

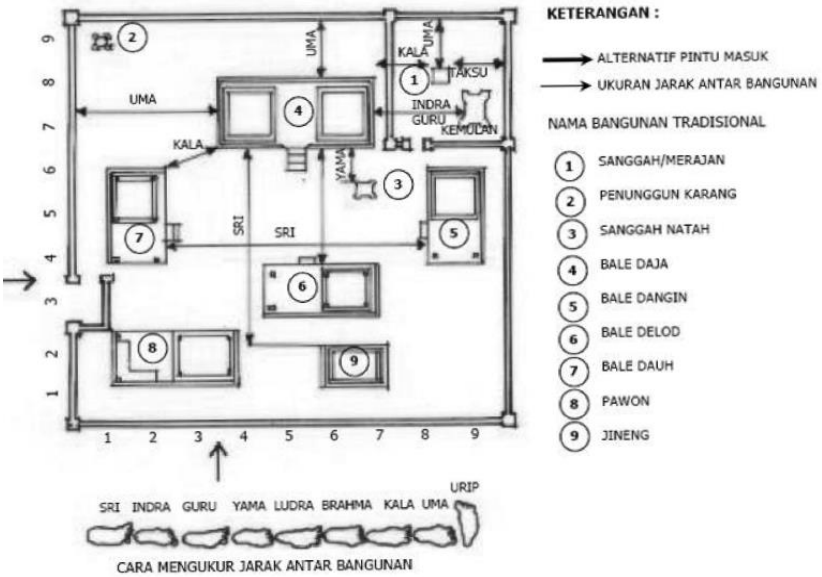

Figure 1 Traditional Balinese Residential Space Pattern & Distance Measurement between Buildings
Source: Adhika, 1994.

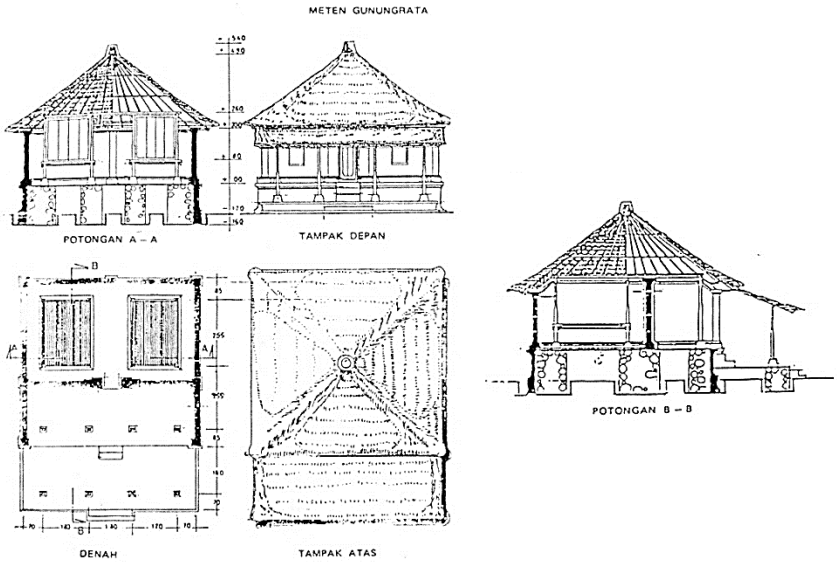

Figure 2 Traditional Balinese Construction
Source: Gelebet, 1986.

Ornaments in Balinese buildings are not only as a mere decoration but also as a symbol and provide information about the meaning contained in the building. Balinese ornaments are generally carved on brick or solid stone. Ornaments in Balinese buildings are broadly called, *pepatran* (flora) and *kekarangan* (fauna). The forms of *patra* are very diverse. Some forms of *patra* have been influenced from outside such as the *Patra Mesir*, *Patra Cina*, and *Patra Welanda*. (Uthama, 2015).

Kekarangan is a fixed pattern, the relief of which varies from a wide variety of animals and the statues of several kinds of animals. The decoration of the fauna in the building takes the forms of animals such as: elephants, gouaches, and other primitive imaginary animals named after the animals that are used as their shapes (Dwijendra, 2008).

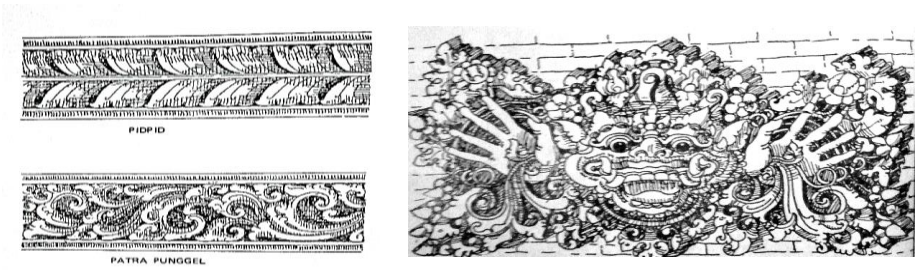

Figure 3 Some Balinese Ornaments
Source: Gelebet, 1986.

4. RESULTS AND DISCUSSION

a. Contemporary Housing with Traditional Shapes and Patterns (Natah)

Dwellings that fall into this category are usually built on relatively large land and consist of several building masses. Visible attempts to defend concepts TBA in the dwelling as seen from the still applied Sanga Mandala and Tri Angga Concepts, although not thoroughly. The application of the Sanga Mandala concept can be seen in the spatial pattern and residential layout in such a way that it meets the criteria of Sanga Mandala. This kind of land arrangement allows the dwelling to have *Natah*. The application of the Tri Angga concept can be seen from the shape

and posture of residential buildings that can still be divided vertically into: head, body and legs.

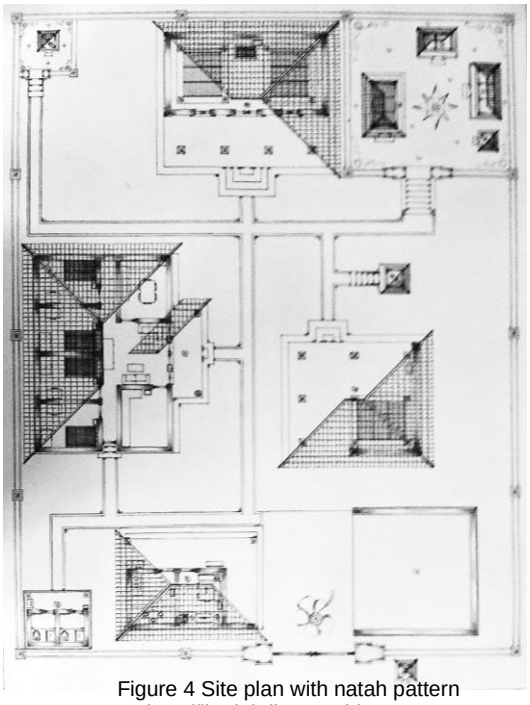

Figure 4 Site plan with natah pattern
Source: http://ikadekdiantara.blogspot.com

Judging from the function of space, there are changes in the function of space, especially in buildings that function as residences. There is a living room and dining room in the main residential building. In traditional residences, eating activities are carried out in *paon*, while joint activities are carried out on the terrace.

There are some dwellings that still use wood material on *the* main column, but some have replaced it with concrete. In buildings that have undergone transformation, especially in construction technology and the application of building materials. The construction used no longer uses *lait* or pegs but uses reinforced concrete.

Figure 5 Front view of the building with some modified ornaments Source:
http://indonesiawow.com

The necessities of life in modern times, one of which is transportation with four-wheeled mode requires a wide entrance. This is done by widening the dimensions *of pamesuan* / *angkul-angkul*, thus allowing car access to the residential area. The selection of materials for *pamesuan* also occurred in changes, which previously used red bricks and/or even mud soil, now switching to materials that are easier to obtain, such as black stone, either sculpted on site or precast.

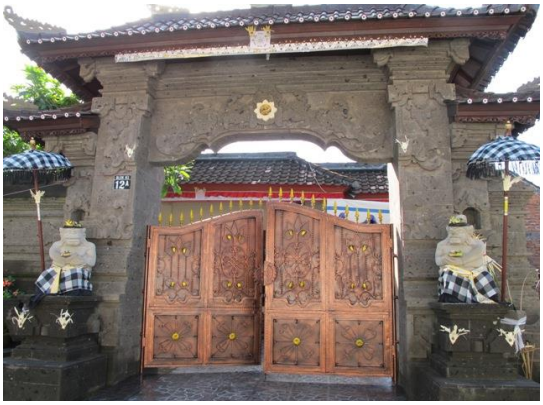

Figure 6 Widened angkul-angkul
Source: https://1219251059ninyomanlitanugrahenidewi.wordpress.com

b. Contemporary Housing with Single Mass d/ aknow dnature Housing Complex

The traditional Balinese space pattern in the form of *natah* patterns in this contemporary housing, can no longer be found. The identity of Balinese architecture in single-mass modern housing can only be seen directly in the appearance or composition of shapes that still display the concept of *Tri Angga*, which divides the mass of the building vertically into parts: head-body-legs. Likewise, the use of ornaments and building materials can still be maintained, even if there is a change in shape through a process of transformation or modification. In some dwellings, buildings are found that do not use traditional Balinese ornaments, but adopt stingers / fences and *angkul-angkul* with some modifications

Figure 7 Kontomporer dwelling without traditional Balinese ornaments but adopting *penyengker / fence and angkul-angkul*
Source: rumahin.wordpress.com

Since the last few years, the provision of houses in Denpasar City is fully provided by private developers who provide various alternative types of houses for those with lower middle incomes, ranging from type 15 to type 70 m 2 with a land area of 60-200 m^2, known as Kapling Siap Bangun (KSB). Of these types of houses, some of the types chosen by the residents of Denpasar City are types 21, 36, 45, and 70. However, since 1998, the construction of type 21 was stopped because in addition to fears that the small type would lead to the creation of slum houses, also because the selling price of type 21 is no longer profitable due to the increasingly expensive land prices (Dewi and Swanendri 2007).

The identity of Balinese Architecture in residential housing can only be identified in the form that follows the *Tri Angga* concept, especially in the "head" / roof that displays the characteristics of a Balinese residential roof with a game of *mudra* and *ikut cledu*. For the rest, this type of residence lacks traditional ornaments and does not adopt *penyengker* / fences and *angkul-angkul* as is generally a traditional Balinese residence.

Figure 8 Contomporer house in a residential complex
Source: rumahin.wordpress.com

5. CONCLUSION

The identity of invulnerability in Balinese residential has changed along with the times, the needs of life and the socio-economic conditions of the community. There are residences that are able to maintain some of their identity of invulnerability by maintaining space patterns and shapes in accordance with Traditional Balinese Architecture, but in other elements of identity, such as in construction systems and building materials have changed. On the other hand, there are also residences that are only able to maintain an identity of invulnerability through a composition of forms that follow the Tri *Angga* concept, but do not follow the pattern of traditional Balinese residential spaces. The biggest change occurred in Kapling Siap Bangun (KSB), the lack of TBA application.

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