J. Basic. Appl. Sci. Res., 9(3)14-21, 2019

ISSN 2090-4304
Journal of Basic and Applied Scientific Research
www.textroad.com

The Strong Architectonic Elements of Traditional Vernacular Architecture in Indonesia

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Received: February 4, 2019
Accepted: April 30, 2019

ABSTRACT

Indonesia has a wealth of traditional vernacular building architecture that is scattered with various types of shapes. The diversity is estimated to have strong elements that show a red thread in the form of architectonic patterns. Through this study, it is expected that architectonic patterns may be recognized based on the diversity and distinctiveness of the designs displayed so that their potential can be determined for both the present and the future. Many descriptions of architectural designs encountered in Indonesia today with their specific form give the impression of being detached from their specific 'place' and 'collective memory' owned by Indonesia. This study aims to explain the architecturally strong elements of traditional Indonesian buildings through typo-morphology. Based on architectonic comparative studies, various elements of traditional Indonesian residential architecture are identified with strong elements including the concepts of Ornamental, Symbiosis of Outer, Transitional, and Inner Space, Breathing Walls, Roof Domination, Non-Rigid Structures, and the like. These elements have the potential to be further developed reflecting the progress being made in this era (progressive-visionary), but still built based on the values of locality that refer to Indonesia's noble culture.
KEYWORDS: Architectonic, Traditional, Indonesian, Vernacular, Typo-morphology

1. INTRODUCTION

Indonesia has a rich variety of traditional architecture in abundant vernacular forms. This diversity of forms shows the existence of a strong architectural tradition in Indonesia established since the past. The architectural tradition is manifested in the ability to process forms through adequate creativity. The architectural wealth in the present can be presented as a local historical prototype, given the current globalization capable of penetrating territorial boundaries. This local historical prototype can enrich local identity. The effort to represent identity through localism is one of the responses to the phenomenon of globalization. Representations originating from past traditions and localities can be a reference in generating identity. Identity cannot be presented instantly but through repeated regular and persistent stages. Knowledge of local traditional architecture must be consistently preserved [1]

Learning about and preserving the vernacular-traditional architecture do not mean being trapped in romanticism in the sense of glorifying the past but must be able to be linked to its continuity with the future. Preservation should be understood not only in reference to the conservation of the object itself but also the values, wisdom, and elements that can be transformed for the present and the future. Changes in human culture are simply unavoidable, so that architecture as a container will follow suit in making adjustments. Architecture can be an object that is archaeological in keeping a low profile but can also be transformative in that it dynamically inherits its elements for the future. Today's postmodernism [2] provides an opportunity for freedom of excavation of sources of design inspiration that present an identity or character, which is derived from the spirit of the past, locality and regionalism. Postmodernism offers challenges (plurality) as well as opportunities to pay attention to the other side posed by the reality of its society.

This study is an architectonic exploration related to traditional vernacular residential architecture in the Indonesia. Basically, architectural excavation can be very broad, so this study is only one model and is limited to the problem of representation of form and space. The approach taken is through typo-morphology. The exploration of sources that refer to locality can also be linked to climate issue, such as Indonesia with its tropicality. Architecture in the tropics basically has different characteristics from non-tropical regions. However, countries/continents with a tropical climate include not only Indonesia, but also Africa and Latin America, so that the tropical element is "insufficient" to represent the character of locality [1]

The understanding of architectonic in this study is related to the properties and principles of architecture or design such as the problem of space-form including the tectonics of its formation. In this study, the architectural principles of traditional Indonesian architecture will be examined in the form of architectonic patterns. These principles concern the problem of form and space. Thus the potential is expected to be recognized so that it may be transformed in the era of the present and future. Through transformation it is possible for representations

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originating from the past to be used as a source of inspiration for contemporary architecture. The transformation process involves changing forms and meaning, which can be accomplished through borrowing. The Strategy of Borrowing [3] is a transformational approach through formally borrowing a form derived from paintings, sculptures, objects and other artifacts. By way of this process, two and three dimensional characters are studied in an attempt to interpret their application and possibilities. This transformation is a "pictorial transferring" (image transfer) that can also be a "pictorial metaphor" (image metaphor). To give an example, a form of Javanese house is used as the basis for transformation in designing a hotel, or other public buildings.

The reuse of old architecture into new buildings seems to be in line with the spirit of the developing era, namely that of postmodernism. Postmodernism, which is seen as critical of modernism, is essentially promoting the concept of double coding, which combines cross-coding values, namely old-new, global-local, and so forth. Therefore, postmodernism as a basis for developing ideas through the transformation of architectural forms enables efforts to recontextualize past values such as the ones relating to place and spirit of place, local wisdom, and the like. History can be understood not only through the past but also through the history of the present. In his discussion of the present, the French philosopher and historian of ideas Michel Foucault mentions [4] that historical studies must always be related to the present. History is not understood to have come to a grinding halt in the past but is dynamic, especially with regard to its impact on the present.

2. METHODS

This research has been conducted in a descriptive argumentative way to explain in architectural terms Indonesian traditional buildings through typo-morphology. Understanding of typologies or architectural typo-morphology studies can be interpreted as an assessment of architectural types by taking into account the forming elements (structure/elements/ components) and their composition. The emphasis of typo-morphological study is more on the analysis of the forming elements/components/structure of in a type [5]. This approach can be used to examine the extent to which representations of types of enshrined design elements are used in the various contexts of different eras. In addition, typo-morphological studies can be used to identify correlations of architectural forms, properties, and rules[6]. The nature or character can be associated with aesthetic principles such as unity, balance, point of interest, hierarchical symmetry, rhythm/repetition, tone, the principle of emphasis, texture, the solid-void contrast, and scale-proportions [7] [8].

Thus it is expected that in a holistic manner, it can be discerned that the strong architectonic elements contained in its design include space and form. By understanding the strong elements, it is expected that these potentials can be analyzed for building designs in the present. Not all locations can be reached through field surveys due to limitations, so they will be selected by purposive sampling. Assessments and comparisons will be made of the floor plan and appearance, and place the following components in it such as facades and ornaments.

In general the steps of the research carried out are: Comparing the traditional vernacular building design to find the correlation between the design elements of the building's architectural type through a typo-morphological study. The variables used are architectural elements, namely spatial plans and layouts, figures, decorative ornamentations, and the technology-construction used [9][10]. Make an interpretation and an analysis based on consideration of these rules to look for the potential that can be transformed in the fixed framework referring to the characteristic forms of Indonesian architecture. The results of this study are expected to enrich the understanding of a red thread or strong element in the architectonic patterns.

3. RESULTS AND DISCUSSION

3.1 Symbiosis of Outer-Transition-Inner Space

The meaning of outer-transition-inner Space are familiar in East Architecture [11]. Recognizing space in traditional residential architecture in Indonesia can be understood not only in the form of internal space but also involves outside space and space between outer space and inner space (transitional space). Outer space is known as the yard in the form of open space as a place of public interaction. Transitional or intermediate space can be connected with terraces/verandah such as in Java or falling under the architecture outside Java. Inner Space can be dialogue with the main building which is the core, like the palaces on Java, the Banua in Toraja, Jabu among the Bataknese, Betang among the Dayak tribe, and so on. These spaces can be understood as a unified whole space between inner space, transition, and outer space. This idea illustrates the continuity between space in the form of permeable, flowing spaces, through semi-open terraces. The outer spaces between the masses of the building are not considered to be independent but designed continuous with transitional (semi-open) space and inner space.

The idea of the continuity of the space is strongly influenced by the surrounding tropical nature. Tropical nature allows outdoor activities throughout the year. Thus the site layout and mass management in traditional architecture in Indonesia are prepared by taking into account the interaction of the outer space (in the form of open space), the transitional or intermediate space (under or terrace) and the inner space (building core) as a symbiotic and continuous entity. The potential of a tropical climate that is rich in sunlight and rainwater can be utilized in

everyday life. Spaces are arranged in a geometric order that allows them to be ‘flowing' and 'permeable' so as to give rise to interactions - the symbiosis between spaces when used, such as the inner space and the transitional one.

Recognizing space in traditional Indonesian architecture can be associated with the activities applied in it. The nature of space such as public and private spaces is not limited to the fence boundary as it is now. The residential yard or courtyard can be a public space that can be used anytime from morning to night as a place to interact and move. In traditional buildings, for example, the public can be seen in the yard or yards that mingle with one another, not limited to well-defined fences. The privacy limit can be shown in the form of a residential building. Open or semi-open spaces in the form of yards or in the form of terraces or the *kolong* (pit/vault) underneath can be a representation of public-togetherness ideas, while closed spaces depict a private space. Public and private spaces can be recognized through the figures displayed, namely in the form of closed-massive and open representations. The mass management of public private space can be recognized through a solid-closed-massive and void-open-transparent display.

Public space can be interpreted as a shared space or space that is used as a place of daily activities both from a small scope of the family to the larger scope of the village or city. Understanding the traditional architectural space of the archipelago can be connected with the interaction of balance or integration between solid-closed-closed and void-open parts. Closed spaces have functions that are not only private but also sacred. Space in traditional architecture is interpreted as an element of sacredness and worldliness that limit one another but also synergize.

Figure 1 Symbiosis of Outer-Transition-Inner Space [12] [13] [14]

From an architectural point of view, space in the context of traditional Indonesian architecture can be understood - in its existence, emergence, and presence - in symbiotic terms between solid-massive-closed and void-transparent-open (sacred and profane, private and public) as a whole, so not as a separate unit of activity, such as interior and exterior dichotomy [15]. The integration of outer space, transition and inner nature has basically shaped the fundamental character of traditional architecture in Indonesia [1] . This is a piece of wisdom that can be developed again in modern buildings in Indonesia, including the processing of spaces that connect the exterior and interior of the building. In simple terms, it can be understood that the core elements in the architectural design of houses in Indonesia are important, as well as the processing of their outer space. Terraces/verandah and outdoor spaces in the context of buildings in Indonesia can be used throughout the year without being disturbed by winter.

3.2 Strong Elements

Based on architectonic comparative studies various elements of traditional Indonesian housing architecture are identified by several strong elements, among others:

1**. Bio Mimesis and Geometric**, in its **sculptural** or **ornamental** form, the building uses ornamentation such as patterns of decorative tendrils, animals, *moulding* in the form of a lotus, geometric square decorations, square shapes, and curves for doors.

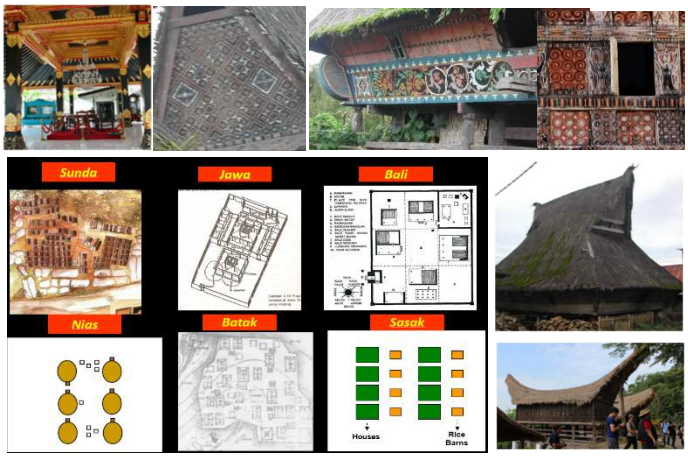

Figure 2 Bio mimesis-Geometric, Solid Void Linear, and Cluster in Ornament and Shape [1] [14] [15] [17] [18]

Ornaments can also be painted on the skin of its inhabitants. Bio mimesis is also shown on the shape of the roof in several buildings which shows the curve elements resembling the shape of horns as well as in some building elements in texture on some parts of the roof or walls of the building. Geometric can be identified from spatial and mass and ornamentation. The building plan shows a geometric composition in the form of a straightforward and clear basic form such as a rectangle/oval/cruciform.

2. Solid Void in linear or cluster patterns. The mass shows a solid-void composition (in the form of a cluster or linear pattern) which shows the symbiosis of the unity of Inner Space, Outer Space, and Transitional Space.

3. Base Element and Top Element

The building shows the bottom-base element and the top. The upper part is in the form of a body and head (roof). The building's legs can be in the form of a base that is lifted in the form of a floor of a stage-clumped or not classified (massive); or a base that is not lifted.

4. Dominant roof

The roof shows the dominant proportion compared to the element of the body or its legs, so that the body appears to be part of the roof or it can also make the impression of lightness drifting using *piloti* (ground-level supporting columns or stilts) like *pendopo* - a pavilion (the dominant roof is supported by columns).The shape of the roof can be divided into two types, namely saddles and shields with various variations. In modernism architecture, the concept of the form of *piloti* is also known, which is heavy but makes a light impression.

Figure 3. Base and top element, Dominant roof (various of Indonesian traditional architecture) [12]

5. Breathable, in the form of breathing walls arranged using materials that can drain air in the cracks both made of wooden boards, bamboo cubicles or bricks or just by employing columns so that free air flows like in a pavilion. Nowadays the idea of Breathable can be connected with the green building approach.

Figure 4 . Breathing Wall [14] [12] [19]

6. Volumetric Shape and Vertical Line element, the figure of the building shows the presence of volumetric elements for buildings that are private and sacred and elements of the vertical line for buildings that are public and profane.

Figure 5. Volumetric Shape and Vertical Liniar, Hierarchy, Repetition [1] [20] [21]

7. Hierarchy- repetition in spatial and mass order and figure, the focus of interest in facade processing and mass arrangement.

8. Natural axes The mass and space are arranged by taking into account the concept of harmony with natural and environmental cosmology which is manifested in the form of an axis (this can be linear or centered), related with the orientation of the building and its footprint on the surrounding natural environment such as the sea, upstream and downstream of the river. Nowadays these idea can be related with the environmental and ecological awareness approach.

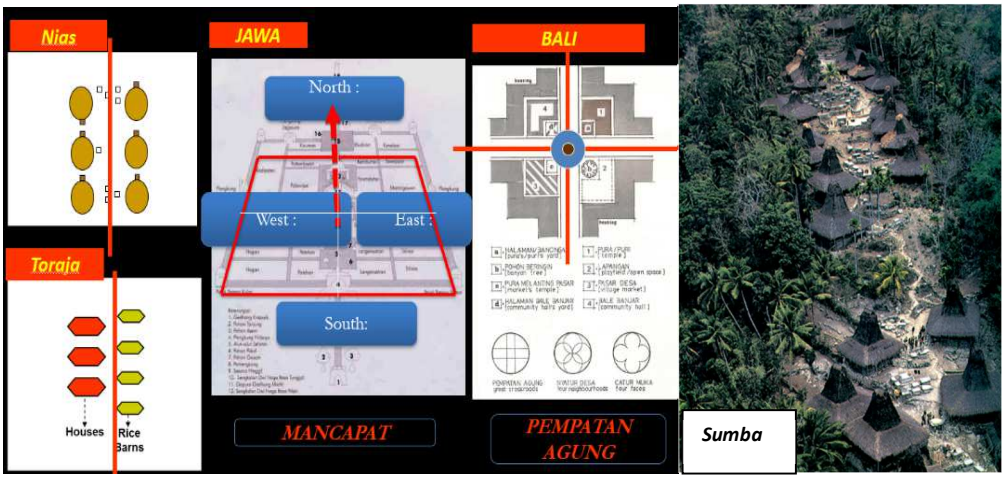

Figure 6. Axes and Enviromental – Mountain-Sea Axis, upstream and downstream Axis [1] [22][23]

9. The structure is non-rigid, knock-down, and movable. Construction of buildings is structured with a system that is not rigid (as it can sway) and can be dismantled or moved in mutual cooperation *(gotong royong)* [23]. The connection system can use pegs and ties. This structural system can be associated with resilience to earthquakes.

Figure 7 Not Rigid, Moveble, Portable, and Knock Down – Mitigation Resilient[12][14] [18] [25] [26]

These elements can be considered to be transferable and transformative if they will be developed in contemporary buildings, such as voiced by postmodernism such as bio mimesis or voiced by the modernist movement [27] that is the impression of the floating *pilotii* mentioned above, or expressed in green building [28] or disaster mitigation such as non-rigid structures, and the like. These elements can be borrowed, reprocessed and developed into new architectural forms, so that they are relevant for both the present and future. However, in its exploration, of course, the fundamental characteristics are not ignored such as tropical architectural spaces that pay attention to the inner outer-transitional space, its figures, its ornaments, and so on. However, the traditional architecture still has limitations, for example the core house is basically only used for sleeping so that it is closed and the natural light is not optimal. In addition, on the other hand there are limitations in the structural system if further linked to high-rise modern buildings.

The use of past representations makes it possible to arrive at new meanings and views or extensions of previous meanings. The meaning is always found in the negotiation process and adapted to the new situation. The point is that meaning is not inherent in something in this world, being always constructed and produced through a process of representation and being the result of marking practices [29]. the hyper-reality world is a surpassing world, created by the use of hyper-signs and hyper-signification systems in describing reality, so that the difference between reality and non-reality, the sign/reality dissolves[30]. An example in modern times is the use of the Parthenon (temple) design elements for buildings that serve governmental functions. In this case the Government is associated with the Parthenon, even though there is no realistic correlation of between the two. Parthenon elements can be hyper signed in the context of hyper-reality.

4. CONCLUSIONS

Architectural work can be seen as a symbol of dream reality as well as mythology that describes the manifestation of the deepest human desires. Symbols derived from archetype, the memory of collective ideas, and primordial images can be presented through the medium of myth-legend. Creativity in the form of design transformation is presented to produce an embodiment that can form a bridge between old ideas and new ones. This dialogic creativity is the identity and key that Indonesian society has had in the past when responding to new phenomena. The dialogue with the past shows people's awareness of respecting their origins or identity in Indonesia. This shows sustainability in behaving and being creative in producing works dynamically.

Based on the study above, there are elements that are considered significant in traditional architecture, among others, the synergy between inner space, outer space, and transitional space so that the terrace and courtyard elements become very important. The arrangement of these spaces is highly concerned about the symbiosis between outer, inner and transitional spaces such as optimizing the terraces, and semi-open foyers. Traditional architecture accentuates the proportion of dominant roofs, so that the roof element becomes become a very important element in processing building figures. The synergy of the outer-transitional-inner space and the dominant roof is a reflection of the tropical context.

In addition, the spaces presented show the existence of sacred and secular nature. This constitutes a real picture depicting the religiosity of the people who live in it. The environment is an important consideration in placing space and mass, especially with regard to natural cosmology. This phenomenon shows the nature of the spirituality of the Indonesian people who greatly appreciate the synergy of nature and divinity. The concept of sacredness is also shown in the exploration of the use of symbols in the form of spatial, figurative and ornamental elements. Ornaments should not be seen as mere decorations that refer to floral and geometric shapes but also as ones carrying special meanings. At present the ornaments can be developed as part of processing the texture of the figure and façade of the building so as to convey profound meaning.

Acknowledgements

- LPPM Parahyangan Catholic University (Unpar)
- Faculty of Engineering, Architecture Department, Unpar

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