

Minimalist Architecture; Discussion of Its Sustainability in Indonesia

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Abstract— Architecture develops along with particular society changing. In the period of modern, some traditional architecture with their complex rules become considered old fashioned. It was not implemented in modern buildings. When functionality becomes priority, minimalist architecture, recognized as Neo-Modernism, spreads and offers reflection of modern lifestyle. However, every style is not always suitable for each circumstance. The unconditional application of style can create another problem instead of a solution. This essay will discuss the existence of minimalism in architecture; its historical relationship with modernism, the theoretical reviews which underpin the discussion and the appropriate adaptations need to be made to fit in tropical climate.

Keywords— Minimalist architecture, tropical climate, sustainability.

I. INTRODUCTION

Architecture develops along with particular society changing especially in relation to their way of life, since it is a product of culture. Rudofsky (1981) introduces the term of “architecture without architect” in cases of recognizing the traditional architecture excellence that our ancestors did not follow scientific methods to create their architecture. They just found it instinctively by trial and error process over a long period, so called evolution [1].

In the period of modernity, when everything had to be done in the name of function, some traditional architecture values with their complex rules become considered old fashioned and rare to be implemented in modern buildings. It may be because most people may not want to use it or could not build it [2]. Moreover, when people tend to be “...dynamic, practical and active...” [3], they look for type of architecture that reflects their lifestyle since “the architecture is the physical expression ... it follows a particular life” [4]. Recently, a new wave spreads the concept of minimalism that seems to be a perfect answer of current society searching for the latest new thing.

However, every style is not always suitable for each circumstance. In addition, the unconditional application of style can create another problem instead of a solution. This essay will discuss the existence of minimalist architecture; its historical relationship with modernism, the theoretical

reviews which underpin the discussion and the appropriate adaptations need to be made to fit in tropical climate.

II. BACKGROUND

A. Minimalist House Trend



Fig. 1 A minimalist house; representing geometrical form

Minimalist houses have been popular since 2004s and are still likely to be a favourite choice besides Classic and Neo-classic styles in the next couple of years [5]. Reference [6]

describes the minimalist architecture characteristics as “... geometrics in design, efficient concept, open plan and simple house”.

Its performance had already been represented by the Le Corbusier design, Villa Savoye that was built in 1928: a modern architecture product. Its concept of efficiency and simplicity seems similar with the functionality of modernism based on “form follows functions” of Sullivan and “less is more” of Corbusier.



Fig. 2 Villa Savoye as an example of modern architecture

B. Historical Reviews

Some similarities above lead to an anxiety that the collapse of modernism in architecture may also happen to minimalism, since it is called neo-modernism. As widely known from the past, at the end of modern period, architecture gave a lot of priority to functionality. This condition was supported by the practicality of using fabricated materials in modules that make it possible to finish a project in shorter time than ever before. The “form follows function” concept of Sullivan changed to form follows fabrication that later left out design process considerations.

A most noticeable event of modern architectural history is Pruitt Igoe housing project (1955) in St. Louis, Missouri, USA, designed by Minoru Yamasaki [7].



Fig. 3 The demolition of Pruitt-Igoe apartments

Originally it was built to settle the community in separate buildings but in the same area (Pruitt was for black residents and Igoe was for whites) but it became integrated after its opening. Ten years after they had been occupied, the management had to tear some buildings down to save the

others. Having failed in problem solving, the apartments created new problems in the community such as vandalism and racism. This bad situation continued until 1972 when the Housing Authority decided on demolition of the apartments. This event is thought to represent as the collapse of modernism in architecture. Reference [8] argues that it fell because the architect did not consider the contextual requirement such as where the buildings were going to be built, what kind of community will use the buildings and the importance of the how particular culture they belong to.

C. Research Concern

This scenario could happen in minimalist architecture, since some designers might be misunderstanding about the exact characteristics of it and apply the same designs to different context without thinking of the specific condition, historically and culturally. That is why some design becomes uncomfortable, such as unpractical because the buildings need a lot of regular treatment and dependent on artificial equipment and is unsuitable for users' ways of life.

III. LITERATURE REVIEWS.

A. Minimalist Architecture

According to John Pawson, an architect who is known as one of the minimalism pioneers in architecture, minimalism is defined as “... making the best possible contexts for the things which matter in life, on paring back the accretions of surface and behaviour to what essential...”. It has goal to create ease for physical body [4]. Other architects from Bredemeyer Consulting, Malan and Bredemeyer [9] explain it as approach that “... sort out what your highest priority architectural requirements are, then do the least you possibly can do to achieve them!”. Similarly Nurdiani [3] describes it as “... the way of thinking, a way of new approach in seeing design as reflection of urban society that is efficient, practical, clear, transparent and enjoyment in limitation”.

Reference [10] in his thesis sees Indonesia's minimalist architecture has developed in two tendencies. On the one hand, minimalist architecture seems to be experimentalism of architecture which is important for development of architecture. On the other hand, minimalist has been used only for labelling particular type of architectural presentation for marketing purposes.

B. Traditional Architecture

According to Miratab [11], vernacular architecture gives solution as a problem solving that environmentally, sustainable and socially fulfilling. This may be cause the architecture integrates specific occupant activities and provides supported condition by accommodating wether ecological, cultural, economic, political, spiritual or social. Moreover, traditional architecture in Indonesia has been researched in its development to adapt with tropical climate. The adaptations are proved suitable for tropical architectural requirement that considering climate influences in occupant's comfort. Reference [1] points out the purposes of the adaptations based on the characteristics of the roof with

its ventilation, the wall as breathing divider and the floor with its breathing material that proved created thermal comfort.

C. Tropical Architecture

Tropo architects, discussed by Philip Goad in reference [10] has emphasized the good principles of tropical house design in their 'Punkahs and Pith Helmets'; a report of top end housing research on June 1982. They are

1. The promotion of cooling breezes
2. Ventilation by convection
3. Reducing radiation of heat
4. Sheltering of walls and openings

Those principles had been applied by our ancestor for constructing traditional architecture. They had considered geographical prerequisite and anticipated the climate.

IV. TROPICAL MINIMALIST ARCHITECTURE

There is strong argument that the quality of design is assessed by whether people feel comfort or not when using a building. It means that good architecture requires creating comfort as well as including climate consideration. Similar with that statement, minimalist architecture actually has goal to create physical comfort. However it can be argued that the general characteristics of minimalist architecture cannot be directly implemented into house design in Indonesia because they do not include some adjustments for specific conditions, climate for example.

Adapting every style of architecture including minimalist to be suitable for a tropical region can be done by modifying the microclimate, designing the building with a passive system approach and using additional equipment as the last alternative [12]. The solution that is closely related to the style of architecture is the second one: a passive system design approach that makes possible for the building to create its own comfort.

Traditional architecture in Indonesia might be recognised as architecture of the roof. That statement is supported by Samodra in research findings [13] that the most influential part of house to create thermal comfort is the roof. The roof must be a breathing surface such as roof tiles not a total concrete roof because it is possible for the fresh wind to blow in through the fissures between the tiles. This new air pushes and replaces the old that is already hot because of sun radiation. The roof also shall be in two layer type for ensuring that the hot air be cause of the sun radiation is trapped in space between layers. Therefore the trapped hot air will not heat up the room and the occupants. Roof existence can be expanded as its sun shading function. For these reasons the passive approach of minimalist architecture might be more optimal in creating thermal comfort by using appropriate sun shading to protect the window from over sunlight that can heat the indoor thermal.

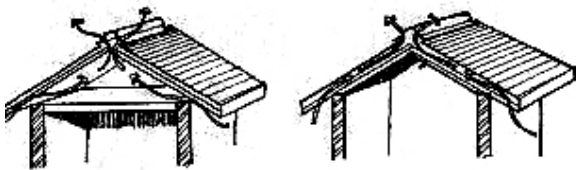


Fig. 4 Two layer roof system

Another solution is designing the wall as the second skin. Based on Hardiman's observation [1] the good wall must be formed with breathing material so the air can continually change to make the indoor air keep healthy. The breathing material does not have to be made from wood or bamboos just like the traditional house often uses since it might become unpractical, but can be created with using windows that still allow wind to enter even when it is closed.



Fig. 5 Appropriate shading and breathing wall

The last solution is dealing with the house orientation. It will be a benefit to have good orientation for example south, but it does not mean that we cannot do anything if the house has to face the most difficult direction. Using a barrier might be right decision that could be in form of vegetation or a massive wall. In some cases must be considered if the position of the barrier is the only opportunity to put an opening such as windows and doors. Double facade can be implemented, just as Colonial architecture did for its adaptation to tropical climate. On the other hand, Suryabrata's idea [13] of using "saw-like" form could be an appropriate suggestion. That form is proposed to cope the unfortunate sunlight orientation, by opening arrangements to create cross ventilation, placing window to optimize day lighting and using higher temperature settings to reduce the demand of colder temperature.

V. CONCLUSIONS

Despite of its similarity with modernism, minimalist style in architecture actually can be suitable enough to be applied in a tropical climate like Indonesia as long as the design is made with climate consideration. This approach would make the building creates its own thermal comfort as an adaptation of conditional requirements. By being less dependent from artificial support, the minimalist architecture could reach its main goal in creating ease for the physical body in a sustainable way.

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REFERENCES

- [1] G. Hardiman, "The wisdom of traditional architecture in Indonesia to anticipate the problem of the thermal comfort inside the building", in *The 6th International Seminar on Sustainable Environment and Architecture*, 2005.
- [2] C. Mitcham, "Thinking re-vernacular building", *Design Issues*, 21, 1, pp. 32-40, 2005
- [3] N. Nurdiani, "The minimalist house design in Jakarta and its response to the tropical climate", in *The 6th International Seminar of Sustainable Environment and Architecture*, 2005, p.37
- [4] J. Pawson (2004), *Minimalism*, [Online]. Available: <http://www.johnpawson.com/essays/minimalism>
- [5] Eryudhawan, *Arsitektur Masa Kini; Palarisasi Klasik dan Minimalis*, ser. Majalah IDEA in Tren 2005 Rumah Tinggal Masa Kini, Jakarta, Indonesia: 2005
- [6] R.S. Seta, et.al. *Rumah tinggal 2005*, ser. Majalah IDEA in Tren 2005 Rumah Tinggal Masa Kini, Jakarta, Indonesia: 2005
- [7] R.O. Keel. (2006) *Pruitt-Igoe and the End of Modernity*, University of Missouri, St. Louis, [Online]. Available: <http://www.umsl.edu/~rkeel/pruitt-igoe.html>
- [8] Ikhwanuddin, *Menggali Pemikiran Postmodernisme dalam Arsitektur*, Yogyakarta, Indonesia: Gadjah Mada University Press, 2005
- [9] R. Malan and D. Bredemeyer. (2002) 'Minimalist architecture', *ITP ro*, [Online]. Available: http://www.bredemeyer.com/pdf_files/MinimalistArchitecture.PDF>
- [10] H. Kurniawan, "Arsitektur Minimalist; Konsep, Prinsip dan Metoda", M.T. thesis S2, Gadjah Mada University, Yogyakarta, Indonesia, 2009, p.270
- [11] F. Miratab, "Sustainability in environmental design: case studies from the vernacular tradition in Iran", *Australian Planner*, vol 36, 4 pp. 210-215, 1999
- [12] J.A. Suryabrata, "Passive and low energy architecture; an alternative design approach for sustainable development", in *The 6th International Seminar of Sustainable Environment and Architecture*, 2005
- [13] F.X.T. Samodra, "Thermal performance optimization for Javanese village Houses", in *The 6th International Seminar of Sustainable Environment and Architecture*, 2005