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The Social and Environmental Roles of Verandah in Tropical Houses

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***Abstract*—**Located within the tropical belt region, there are certain rules which should implemented in creating a passive sustainable housing design in Malaysia. Traditional Malay house possess a strong character with certain special spaces to create a sustainable house which suit to the tropical climate in Malaysia. One of the special space known as verandah or *serambi gantung*, create various advantages in solving various issues. However, this special space is not extremely being applied currently which produce major issues in term of social and environmental aspects. Hence, this phenomena create a negative impact to the occupant while Malaysia already has a best housing design previously. Therefore, this paper aims to explore both of the main issues mentioned above and reveal the advantages of implementing verandah into passive sustainable housing design in Malaysia. A systematic literature review is the main methodology in this research to identify the various advantages about verandah.. The study reveals that verandah is the best solution in term of social and environmental issues and should be implemented in current housing design in Malaysia.

***Keywords*—**Tropical climate, traditional Malay house, verandah, passive sustainable housing design

I. Introduction

A house should be designed according to its surrounding to create a comfortable condition for itself as well as for the occupants. It also should be well function to protect the occupants from any unnecessary outside elements. The terminology of *'genius loci*' would be one of the best approaches in enhancing the quality of a house which suit to its environment especially climate factor. "*Genius Loci* or 'the genius of the place', refers to the presiding deity or spirit" (Amat S. C, *et al* no date). It will gives a special character for a housing design by considering the locality factor as the main priority which reflect back to the human life. In other hand, a sustainable housing design is not totally for human comfort but it will rejuvenate the environmental condition simultaneously.

Different climate definitely create different approaches in designing houses. Deep understanding may create a well occupied housing design and the same goes to the housing design in Malaysia which located within the tropical belt.

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"The tropical belt-where large areas of South East Asia, India, Africa, and parts of both North and South America are located-forms the biggest landmass in the world and has one of the highest number of rapidly developing cities" [4] Unfortunately, current housing designs in Malaysia are not in accordance with the environment and social conditions which consequently give a negative impacts to the occupants. Occupants have to install artificial building systems to achieve a comfortable condition in buildings such as air conditioning. Hence, this creates another problem where occupant have to spend extra money due to the higher of energy consumption. Beside, social issues are not being considered in current housing design while traditional Malay house was well designed to cater social needs. Traditional Malay house has been known as a sustainable passive housing design that suit the tropical climate condition. It used to be the main housing type and has valuable social and environmental aspects.

Studies has proven that it suits the local climate. "A house is not only a physical space in which people live, but also a space where social interactions and rituals take place" (Ozaki 2001). Traditional Malay house had proved that Malays were very skilful and creative especially the way they created their house which appropriate with their social need as well as to suit the environment. "The fundamental form of Malay traditional housing is to accommodate their occupant daily needs and also to provide better congruence between human behaviour and culture as compared to the modern housing" [3]. Even there are various type of traditional Malay houses, we can see the characteristic and similarity in certain aspects which respond to the local climate. There are various types of spaces in traditional Malay house which should be adopt in current housing design. One of the important space is verandah *(serambi gantung)* which function as a climatic control element as well as space for social and communal activities. These elements have been applied for a long time ago but currently being ignored due to the lack of information as well as rapid modernisation at certain area in Malaysia.

Various definitions has been used to describe how special this architectural elements to the housing design as well to the sustainable environment. "The word is originally introduced from India, where it is found in several native languages besides Hindi as baranda in Bengali, but appears merely an adaptation of Portuguese and older Spanish veranda (baranda) which is a railing, balustrade or balcony" (Murray & James. Ed. 1989). This is the first definition for verandah and it is quite related with the second definition. "An open portico or light roofed gallery extending along the front, and occasionally other sides, of a dwelling or other building; frequently erected mainly as a protection or shelter from sun or rain" (Murray & James. Ed. 1989).

For the third definition, its describe forecourt or known as verandah from New Zealand and Australia."Verandah is a

roof like structure built alongside of a building, especially one built over the pavement outside business premises" (Murray & James, Ed.1989). According to this definition, it referred to the function of verandah which is located along side shopping streets and protects interior spaces from rain and sunlight penetration. Fourth definition is quite related with to other definition. Verandah is described, "as an open area usually roofed and sometimes partially enclosed or screened, attached to the exterior or at the sides of a house or other buildings. The roofing is normally supported by pillars and a light rail or balustrades often surround it" (Zuhairuse Md. Darus *et al* no date).

II. Verandah In Traditional Malay House

In a typical Malay House (Figure 1), verandah is usually located at a lower level compared to *rumah ibu* which function as a transition space between *anjung* and the other spaces such as *rumah ibu*, *serambi samanaik* and *lepau*. "The lepau is referred to as 'the extra space'. Usually it is built when the family increases or when extra space is needed" (Philip Gibbs 1987). Verandah or *serambi gantung* is covered by a skillion roof and slightly wider than *serambi samanaik*. "The serambi gantung is the place where male guests are entertained"(Philip Gibbs 1987). Although considered as an additional components, verandah create valuable impacts in term of sustainable aspects including building design, social activities, privacy and security. "In building regulation handbooks in most Asian countries, the technical difference between a balcony and a *verandah* is defined as that a balcony is the cantilevered platform at the upper levels of the building and should not be more than six feet, while a *verandah* should be a covered space with a roof at ground level" (Zuhairuse Md. Darus et al, no date).

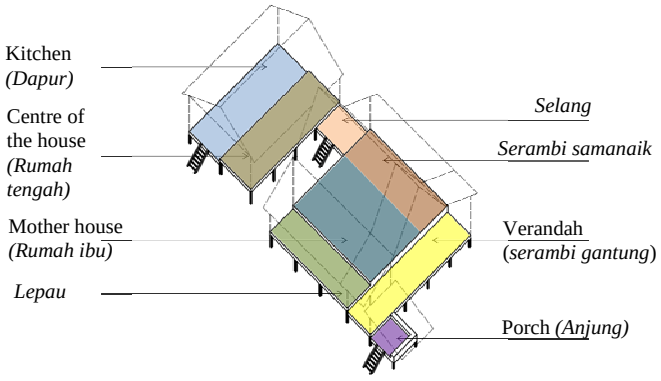

Fig. 1 Location of verandah *(serambi gantung)* in typical traditional Malay house

III. Social Aspects

Verandah creates a connection between both inside and outside of the house. People who come from the street will engage with other person's private rule when they reach this special space.

Besides, it gives a sense of privacy to the occupants and at the same time act as a barrier or three hold to the outside area. "It offers a choice of engagement either with the street life or the private life" (Zuhairuse Md. Darus, *et al* no date).

Study has proven that, verandah encourage occupants to interact with neighbours in a casual and relaxed manner. This study was conducted at one of high rise building in Singapore known as Bedok Court. Verandah in a high rise building is raise but Bedok Court create a new phenomena in architectural building design with its verandah. According to the survey at Bedok Court, verandah encourages residents towards gardening activity which provide them to know their neighbours and create a sense of community. Plants and verandah create a conducive environment for social interaction among community.

Verandah makes the occupant lifestyle easier, safe and secure in term of providing better social and cultural habits. This space, give a good visual contact and act as a welcoming element. Its design is really suit to the local climate where family members can accept and entertain their guest while enjoying the cool fresh air. It also creates a comfortable space for the family members to relax and at the same time socialize with their neighbour and watch their kids playing. Sometimes, family members can visit their neighbour or vice versa and have a discussion which create a good relationship between them. At the same time, this strategy sustaining the interaction between families as well as strengthen the relationship in the community itself.

IV. Environmental Aspects

Verandah is appropriate to the local climate and it provides an effective thermal comfort condition. According to Yuan (1987), the main causes of climatic stress in Malaysia are high temperatures, solar radiation, humidity and glare. In order to achieve climatic comfort in the Malaysian home, these factors must be controlled besides the control of rain, floods and occasional strong winds. People feel warm, comfortable or slightly cool especially in the morning, late afternoon and evening where combination between certain elements such as vegetation, wind as well as shaded area contribute to create a thermal comfort condition. Liang (2005) argues that wind and solar radiation are the critical factors that affect the thermal comfort, compared to the interior spaces. "The warming effect of solar radiation is therefore more influential in the semi-open space than the cooling effect of wind on thermal comfort" (Bay J. W. & Ong B. L, 2006). It shows that solar radiation gives more impacts to thermal comfort condition rather than wind speed as what most people think. Shading elements or shading device can reduce solar radiation level and it depends on the size of verandah.

"The Malay houses were built from timber and raised on stilts" [22]. This special character will encourage the natural wind flow to the whole of the house. Located in front of the house, verandah can easily receive natural fresh air which give an advantages the occupants thermal comfort.

Besides, verandah also known as a semi-open or semi-enclosed space where there is no solid wall as the other certain spaces. Definitely, it will enhanced the natural air flow and it still depend on certain factor especially air velocity. "The air

velocity helps to increase the efficiency of sweat evaporation, and thus avoid discomfort due to moisture on the skin"[10]. As a result, natural ventilation will improve the indoor environmental comfort as well as creating a better condition level for the occupant.

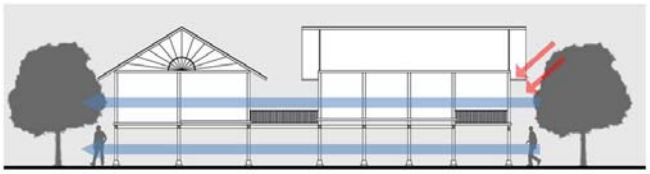

Fig. 2 Natural air flow and sun light penetration in traditional Malay House

Vegetation and plants play a major role in influencing the temperature level at verandah. It depends on the volume of leaves or the size of plants due to its function as shading and cooling effects. As we know, vegetations or plants doing the transpiration and photosynthesis process where these would create a calm and cool condition for the occupants to spend time at verandah even encourage them in gardening. At the same time, this area gives other advantages in term of day lighting and acoustic levels where occupants receive a quality sun light penetration as well as comfortable acoustic level.

V. Conclusion

Verandah has been applied traditionaly in Malay House as well as houses in other counties in tropical region. It provides sustainable lifestyle and moderate the negative impact to the environment. Verandah has played a significant role in creating conducive social and environmental control. Definitely, the provision of this special space in houses would be the recommended solution in creating a sustainable environment in Malaysia.

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