Vernacular Housing in Contemporary Urban Living

Setijanti¹, Silas, Firmaningtyas², Hartatik
Laboratory for Housing and Human Settlement, Dept. of Civil and Architecture, Institut Teknologi
Sepuluh Nopember (ITS), Surabaya, Indonesia
¹psetijanti@arch.its.ac.id
²yayas.sf@gmail.com
³tatatelegan@yahoo.com

ABSTRACT

Indonesia has a numerous vernacular architecture that embodied local values and cultures. However, the number and variety of vernacular housing decreases significantly, became extinct in most big cities such as Jakarta. People tend to leave the vernacular architecture particularly as the style is considered out of date, limited material resources needed such as large measurement of timber and lack of traditional carpenter/skill.

Referring to the Laboratory for Housing and Human Settlement’s experiences in rebuilding and/or renovating vernacular houses in Nias, North Sumatera after the tsunami in 2005 and medical facilities reconstruction in Padang, West Sumatra following the earthquake in 2009, this study aimed to explore the wisdom of vernacular architecture, particularly its houses. The aim is to bring values and forms of traditional architecture into the contemporary housing design and at the same time bring awareness on the preservation of vernacular architecture. This is a descriptive research using qualitative methods with vernacular housing in Padang as the sample.

This research also explores the typology of vernacular housing in Padang based on materials, forms, and functions. Further, the connectivity between the architectural forms and the social value system, and the environmental adaptation aspects are examined. From those, the normative aspects of Padang vernacular housing are formulated. Based on the formulation, new design can be developed to address the challenges of the new world but still has a core of a vernacular architecture.

KEYWORDS: Vernacular architecture, Housing, Norm, and Challenge

1. INTRODUCTION

The existence of a vernacular house has gone through a very long time. It proves ability to accommodate the needs of inhabitants and responds to natural conditions. The earthquake that occurred in 2009 has also proved that vernacular housing structure is an earthquake-resistant. However the number of vernacular house is decreasing.

There have been a number of studies concerning on the value of vernacular settlement such as Rapopot (1969), Waterson (1990) or its capability to respond to earthquake, such as Triyadi et al. (2012), Jorge (2004), and Jigyasu (2002). These studies have revealed valuable information on physical and non-physical value of the vernacular settlement and the capability of local knowledge on reducing earthquake vulnerability.

This research focused on the vernacular house in Padang, West Sumatera. Observations made on the physical aspects (material, form and function) and related non-physical aspects to interpret it. The study conducted in several stages, first, find a typology of Padang vernacular house, explore the values of the Padang vernacular house in relation to customary norms and establish an adaptation model.

The core of Padang vernacular house are obtained through understanding the typology of building structure and its spatial order, and the connection between the building and the social values.
Thus Padang vernacular houses can be developed to address the challenges of climate and socio-economy changes without losing the embodied important values.

2. PADANG, THE CITY AND ITS PEOPLE

Padang is one of the oldest cities laid on the west coast of Sumatra. In the beginning of the 17th century the area was inhabited by fishermen, farmers and salt traders. The area was not important as the ruling centre and production took place in the interior. Trading was mainly developed on the coastal since the Dutch merchants came. In 1660 they entered into an agreement with the kings of Pagaruyung and began to build lodges in 1667. In 1784, the Dutch set Padang as a trading centre of western Sumatera by developing Teluk Bayur port which ever since led to increase the number of merchant ship arrival and the city development.

People of west Sumatera, well known as Minangkabau/Minang ethnic group, speak and perform traditional Minangkabau culture. Minangkabau refers to the ethnic culture of the Malay-growing and large because of the monarchy, and adopts a distinctive customs, which is characterized by the system of kinship through the female line or matrilineal culture despite Islam is the majority religion. Minang community is a part of the community Deutro Melayu who migrated from southern China mainland to the island of Sumatra, about 2500-2000 years ago. These groups are estimated entered from the east of the island of Sumatra, Kampar river flows down to the plateau called darek which is referred as the origin place of the Minangkabau.

3. PADANG VERNACULAR ARCHITECTURE

Vernacular house does not only serve as a shelter only. Most important, for the inhabitant, it is embodied numerous symbols and a micro cosmic of the family as part of the macro cosmic. The form of traditional houses is influenced by religion (Islam), religion and belief as the construction of a house means signs of life and activity of the family within local community. It can be said that the construction of traditional houses, from the collection of materials, design and construction is done within indigenous norms. For example, there are certain rituals such as ceremonial pole erection, salvation and the timing for each stages of construction.

Padang vernacular housing is divided into four (4) types. They are very influenced by Aceh architecture. Aceh in the west-end part of Sumatera had dominated the political economy of coastal Sumatra (including Padang) for about a century, until the late 18th century. Aceh affected the shape of the building as well as the art of the architecture. The roof style called gadang in Padang differs from it in darek and the walls are not filled with carvings. However the influences toward the structure, space arrangement and norms have not significant. The interior has symmetrical shape and the same hierarchy, namely a spacious veranda in the front, centred spacious living room as the core, bilik (rooms) on each side, and a rear room for kitchen. Thus the types are indicated by form of the roof, namely i) Rumah Gadang Berukir, which is the largest one, ii) Dangau Layang-layang, with a straight roof lower to the rear and additional cantilever on the front to protect the veranda, iii) Tungkuh Nasi has a roof that resembles a rice packs/ equilateral trapezoid with a steeper slope and iv) Kajang Padati, similar to the roof of tungkuh nasi, but the edges are not elevated.
The materials of Padang vernacular housing are dominated by local timber such as jati (ironwood), meranti, medang, balam, banio, rasak, surian and kalek. They are used for major construction frame, walls, floors, roof construction, and railing porch, however ironwood is mainly used as the main structure (beams and columns). Timber is used because it is widely available in West Sumatra region. Timber is first immersed in mud for months to make it durable and termite resistant, likewise ruyung and bamboo.
3. THE VALUES OF THE PADANG VERNACULAR

One philosophy of provides guideline and reference in life, including the concept of value and architectural form of traditional houses in Padang by using local materials and forms to suit local needs, for example a steep roof to anticipate high rainfall, porch wide eaves to provide spacious room protected from monsoon rains and sun, and elevated floor to allow wind flow and to create dry floor. The architectural forms are also in harmony with the surrounding natural terrain and steep hills. With reference to the natural conditions, Padang vernacular architecture creates a shelter in harmony with nature (as part of the universe), and its inhabitants as well as functional.

As noted earlier, there are four forms of Padang traditional houses. They are inhabited by families based on their rank within the community. The social order is created based on the relationship between Ninik Mamak (the ancestor) with Kemanakan (the descendant from the female side) which respectively are i) Kemenakan Tali Darah, the descendant of the family who the establishment the community, ii) Kemenakan Tali Ameh, the children of meritorious family, iii) Kemenakan Dibawah Lutuik, the further descendant of the meritorious family and iv) Kemenakan didakekkan, the descendant of the family who has a close relationship to the community.

Like most traditional houses in Indonesia, the form and structure of the house is built in accordance with the needs, culture and the opportunities provided by the nature. The Padang vernacular houses fully exploit the characteristics of humid tropical climate to create a comfortable dwelling. The building materials are fully available, provided by the surroundings. The renewable materials and energy used to mobilise the materials do not have a negative impact on the environment. Material selection is also done in the use of materials. For an important part of the building or the main structure, high-quality materials are selected, while other parts of the building that need more material, easier to maintain or to replace, the easy-grown timber/material are used. Therefore, many families plant tree in their backyard. This pattern is very important to ensure the sustainability of the traditional house and to keep the traditional principles of green houses.

![Figure 4. Spacious and comfort veranda (left) and floor ventilation (right)
(Source: Authors, 2012)](image)

4. AN ADAPTATION MODEL

Reconstruction of health facilities in West Sumatera has been done by using the adaptation model of Padang vernacular housing. It was design with consideration to local context, and nature and environmental context.

4.1. Earthquake resistance

Earthquake strikes frequently in West Sumatera. In 2009, it caused damaged in many buildings in various levels. The concept used in this adaptation model is that the building will not collapse until all residents exit the building, for that reason concept used from the vernacular building is by using a
symmetrical plan, applying core system for the main building, and a simple space form and arrangement.

4.2. Tropic architecture

Building design is also adapted to nature context such as yearly heavy rainfall by using roof form referred to the local one (Kajang Padati) and created a sloped roof ($50^\circ$), maximum opening for wind flow and sun light by using roaster, minimum sun heat by using shading, carefully locate window and ventilation and using void and an open plan to create passive cooling building.

4.3. Green architecture

To create a green architecture the buildings use local materials and are designed to reduce energy consumption by using natural light, cross ventilation, and passive cooling system.

Figure 5. Design of Health Facility in West Sumatera
(a. Floor plan, b. Front elevation, c. Side elevation)
4.4. *Convenience of performing*

The building also concern on the needs of user to perform a good service to the community. Room arrangement and the hierarchy are design to be transparent to create an effective place to work and comfort to reduce the risk of sick building syndrome.

5. CONCLUSION

A vernacular house is not only physical structure, but embodied wisdom, culture and history of a community. With the loss of the character and nature of modern housing, it also lost its peculiarities and the spiritual power of ethnic and community concerned. Padang vernacular house is fairly applicable for the modern building and to adapt modern changes, in terms of community social institutions, climate change and disasters (earthquake) as shown in the reconstruction project in West Sumatera.

The health facilities are designed by taking account of the prevailing local customs house in the term of earthquake resistance structure, tropical forms, environmental friendly design, and its capability to accommodate various needs. Application of traditional house concepts has been applied in contemporary buildings built for a different purpose (health facilities) made of rather modern materials instead of using traditional ones. This attempt proves that the form of vernacular architecture is adaptable to the design and construction of facilities in the contemporary urban living.

REFERENCES


Jigyasu, Rohit., 2002. Reducing Vulnerability through Local Knowledge and Capacity, Dissertation of Faculty of Architecture and Fine Art, Department of Town and Regional Planning, Norwegian University of Science and Technology.

