

Resilience Capacity Planning: A Strategy Requirement for Vernacular Architecture Existences in Lampung as a part of Sustainable Development

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Abstract. Facing vulnerability of vernacular architecture existences, resilience capacity planning is involved as a strategic requirement for new established ecosystems of human settlement. In this context, vernacular architecture, is tangible and more intangible constitute an important research field as is demonstrates a great capacity to evolve and adapt itself to the changing external conditions, as it is a result of several cycles of global change. Vernacular architecture of Lampung is an outstanding example of the adaptation to specific environmental conditions. The vernacular architecture provides excellent shelter from the hot and humid tropical climate. A comprehensive understanding of correlation between resilience and vernacular architecture was created by ordered identify and examine of local community traditions, spatial arrangement land use and building culture that have elected resilience capacity. In this case, Vernacular Architecture existences can be approved as “resilient “that is influenced by dynamic factors such as “macro climate”, “environmental materials” and “living cultures”. Furthermore, vernacular architecture is demonstration of identify and to developed sustainability through time. This paper investigates current relationship between vernacular architecture, resilience and sustainability, a literate review was undertaken including analysis of vernacular architecture history; philosophy, theory, principle, concept and regulation of integrate urban conservation and preservation. Knowledge of vernacular architecture preservation can provide guidance on the building design and construction policy as sustainable development that aim to increase the capacity of social-ecological system to respond and to adapt environmental and socio- economic stressors. With this paper, we aim a basis for measuring the resilience of urban system according to sustainable development for historical heritage and resilient approach that has applied in vernacular settlement.

Keyword: Vernacular, Architecture, Resilience, Sustainable, and Lampung

1. Introduction

The Indonesian island of Sumatra is the sixth largest island in the world. The rich ethnic diversity and historical heritage in Sumatra is reflected in range architecture styles in the island. The vernacular style is the native Sumatran ethnic group’s architecture of dwellings, while the Hindu-Buddhist architecture reflected through the cultural historical heritage built in Sumatra. One of sample of the cultural heritage of Sumatera is Architecture Traditional. Each Sumatera’s ethnic groups have its own distinctive form of the traditional vernacular architecture of Indonesia, known as rumah adat. Rumah

adat or Custom House is at the centre of a web of customs, social relations, traditional laws, taboos, myths and religions that bind the villagers together. The house provides the main focus for the family and its community, and is the point of departure for many activities of its residents. Traditional Indonesian homes are not architect designed, rather villagers build their own homes, or a community will pool their resources for a structure built under the direction of a master builder and/or a carpenter [24].

On the other hand, rumah adat is well adapted to climate and natural hazards like hurricanes or earthquakes. The Indonesian region lying at the junction of the Eurasian, Indo-Australian and Philippine Sea tectonic plates poses an actively deforming area with high seismicity. This is associated with the fast motion of plates at the Sumatra subduction zone accommodating 49 mm/year of oblique convergence. Lateral displacement causes large damaging earthquakes (e.g. Mw 7.6 in 1943). Probabilistic hazard analysis shows high vulnerability across Sumatra and low to moderate hazard across the Malaysian peninsula.

Vernacular architecture of Lampung is an outstanding example of the adaptation to specific environmental conditions. In 1883 and 2018, Lampung was hit by a series of earthquakes and volcanology causing death of thousands of people. Besides the human tragedy the earthquake the natural disasters showed that outstanding resilience of the vernacular buildings: whereas 80 percent of the modern style houses collapsed, few old buildings were damaged, causing less harm to the inhabitants. The vernacular architecture provides excellent shelter from the hot and humid tropical climate. In particular they seem to be constructed specifically to withstand the common unstable ground conditions and earthquakes in the area.

Facing vulnerability of vernacular architecture existences, resilience capacity planning is involved as a strategic requirement for new established ecosystems of human settlement. Since we can't predict the future, we must rely on past finding to evaluate factors of resilience [1]. Resiliency has become a strategic requirement for the human settlements (urban and rural) as global change, climate, social and cultural change, natural and industrial disasters and economic shocks affect local communities [17][25]. Local communities have learned to read the signs in the sea, the skies and wildlife to predict impending hazards [22]. Direct experience with disasters has taught many communities the duration, location, time, frequency, intensity, predictability, onset and possible behavior of the hazard linked to these events.

A constant process of transformation has two fundamental principles of resilient architecture such as "flexibility" and "adaptability" was acquired by dynamic architecture of resilient settlements which considering all the surrounding conditions. In order to reduce the negative impacts of the abovementioned changes and increase the safety of the cities, local communities need resilience concept implementation [20][26][4].

In this context, vernacular architecture heritage, more intangible than tangible, constitutes an important research field as it demonstrates a great capacity to evolve and adapt itself to the changing external conditions, as it is a result of several cycles of global changes in itself. A comprehensive understanding of correlation between resilience and vernacular architecture was created by ordered identify and examine of local community traditions, spatial arrangement land use and building culture that have elected resilience capacity. In this case, Vernacular Architecture existences can be approved as "resilient "that is influenced by dynamic factors such as "macro climate", "environmental materials" and "living cultures" [8]. Likewise, local technologies and construction practice often reflect adaptation to the environmental conditions and favors an easy access to the food with self-production area. Due to the uniqueness and originality of vernacular architecture, the requirement of resilience have meet the term of local food security and also help to protect of cultural landscape [1][7].

The existences of vernacular architecture are not ask us to return to the old ways of living as pure of nostalgia, but it inspires us how to responsible at long time use of technology and design [15][16]. Vernacular architecture is demonstration of identify and to developed sustainability through time and modified it self through trial and error to fulfill society's need in harmony with ambient environment

[14]. The lost of vernacular architecture existences discourse is an on going problem surrounding the lost of cultural identify, tradition and social equity [6][18].

2. Motivating and State of The Art

In order to understand motivation behind resilience capacity planning: a strategy requirement for vernacular architecture existences in Lampung as a part of sustainable development, it is most important to understand the current relationship between vernacular architecture, resilience and sustainability, a literate review was undertaken including analysis of vernacular architecture history, philosophy, theory, principle, concept and regulation of integrate urban conservation and preservation. Knowledge of vernacular architecture preservation can provide guidance on the building design and construction policy that aim to increase the capacity of social-ecological system to respond and to adapt environmental and socio- economic stressors [2][4][7]. Vernacular architecture is considered as a complex asset that develops and prospers community life, as well as cultural identity and is a good resource for economic and political interests [4][7].

The research is intended to measure the resilience of urban system according to sustainable development for historical heritage and resilient approach that has applied in vernacular settlement. In particular, this research is deepened by example carried out in Sumatera Island, especially in Lampung Region.

3. Result and Discussion

The existence of identity and the meaning of place can be obtained through clarity. One of the most important aspects in the appearance of this meaning is the visual clarity of urban elements. In general, vernacular architecture of Lampung have successfully put the inhabitants humanely, both as individually or social environmental where reflect the spirit of openness, strength, comfort, beauty and a hierarchy of space. Vernacular architecture of Lampung is at the center of a web of customs, social relations, traditional laws, taboos, myths and religions that bind the villagers together. Man activities of residents has been focused by family and it community in vernacular building, which have produce a vital connection between human and environment [1][4]. In sum, vernacular architecture was built on inherently sustainable principles. Sustainable development has determined by paradigm of vernacular architecture identity, which is natural and social environment evident while society evolution through time [5][9][14][21].

Early idea on sustainability development has focused on concept of achieving stability, practicing effective management and control of change and growth [10]. Resilient need to be link to sustainability, so that the concept of resilient for planning and design will be help people to move toward desired future sustainable system state and not undesirable one. Sustainable and resilience of urban design and planning have expanse on the vernacular influence and capability, integrating climate science, natural system, compact urban form to configure dynamic desirable and healthy communities [11][23]. Sustainability has ability to respond to environmental shock and reduce its vulnerabilities beyond simply optimizing of sustainability. Resilience is more dynamic motion as is refers to transformation, flexibility and adaptation of system through changing circumstances.

On the other hand, A comprehensive understanding of correlation between resilience and vernacular architecture was created by ordered identify and examine of local community traditions, spatial arrangement land use and building culture that have elected resilience capacity [12]. In this case, Vernacular Architecture existences can be approved as “resilient “that is influenced by dynamic factors such as “macro climate”, “environmental materials” and “living cultures”. Furthermore, vernacular architecture is demonstration of identify and to developed sustainability through time. Vernacular architecture can provide a rich field of research concern with developing new strategies of resilient. Vernacular architecture is related to local environment context and available resources where was built from traditional technology, meet specific human need, accommodating the value, economy and way of living the culture that have produced it [13].

Resilience capacity as strategy of vernacular architecture existence enhanced through tree stage of strategies, that is [1][3]:

- Prevention of environment, socio cultural and socio-economic resilience: these three indicators can avoid urban problem or reduce risk through land use management of urban development, assuring appropriate choice of site, considering the hydrography of place and management of water resources, comprehension meteorological an historical system, use locally materials, maintaining the existence of historic buildings and its significant, and maintain the structure of vernacular architecture that can bring the perception and character of place, understanding the value of place, disseminating local knowledge regarding practice and action to cope with disruption, avoid and reduce economic crisis with using local and accessible resources
- Resistance of environment, socio cultural and socio-economic resilience: these three indicators can avoid urban problem or reduce risk through used climate-adapted and durable material, appropriate architectural and structural conformation and natural hazard management, community preparation for emergency, knowledge of alerting system for decision making perspective, sharing good, integrating producing, recognizing value of local product, provide new functions for historic of vernacular building and adaptations of vernacular architecture to adapt to the development of urban area as a consequence of increasing access and role, including the addition of a small-scale business function on the first floor of a urban planning.
- Adaptation of environment, socio cultural and socio-economic resilience: these three indicators can avoid urban problem or reduce risk through flexibility of design, sharing building culture and development of self construction system in order to facilitate fast recovery after natural disaster, sharing activities, sharing infrastructure and facilities.

In achieving these resilience strategies, there are three stages of actions, i.e. :

- In early step, preserve vernacular architecture scenarios for the project were performed identification of vernacular architecture characteristic and maintaining the current condition of vernacular architecture, include protecting the building from damage and providing new functions or dual functions in accordance with the demands of regional development.
- Second step, résistance of vernacular architecture with new functions (cultural, social and economic) of vernacular building, covering functions that accommodate changes in the accessibility system of the area and increased access to vernacular architecture to be able to play a role and benefit from the revitalization.
- Third step, adaptation of urban changing condition and built innovative solution such as creative space and building design in urban design and planning. This solution is useful to support the establishment of unique characteristics of vernacular architecture by giving a specific feel of the place.

4. Conclusion

Based on the research conducted, it can be assumed that the vernacular architecture is a great potentiality evident in 21 century. The existence of vernacular architecture could help people to know what to do and can offer an identified source to develop worthwhile ecological solution for the built environment responding to society need. According to analysis, resilience need to be link to sustainability so that the existence of vernacular architecture we are trying to preserve, plan and develop for actuality help us move toward, desired future sustainable system state and not undesirable ones. Meanwhile, this paper not provides deeper analysis related implementation of sustainable development and resilience system because most of analysis aims to a general role of resilience capacity planning and part of sustainable development in vernacular architecture existences strategy.

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Acknowledgement

We would like to thank citizens of Lampung Regency, especially traditional house's owner at Bandar Lampung and East Lampung for providing us the necessary data and information. This research was performed under the supervision Department of Architecture, Lampung University.