Pertanika J. Sci. & Technol. 25 (S): 29 - 36 (2017)

SCIENCE & TECHNOLOGY

Journal homepage: http://www.pertanika.upm.edu.my/

Sustainable Mid-Rise Vernacular Palace Architecture of Istana Lama Seri Menanti, Negeri Sembilan

Nurdiyana Zainal Abidin[1]*, Raja Nafida Raja Shahminan[2] and Fawazul Khair Ibrahim[2]

[1]Department of Architecture, Faculty of Built Environment, Universiti Teknologi Malaysia (UTM), 81310 Skudai, Johor, Malaysia
[2]Center for the Study of Built Environment in the Malay World (KALAM), Universiti Teknologi Malaysia (UTM), 81310 Skudai, Johor, Malaysia

ABSTRACT

Sustainability is an important factor in designing vernacular architecture, including vernacular palace architecture; the latter refers to low-rise buildings similar to Traditional Malay Houses (TMH). However, the Istana Lama Seri Menanti is a 4-storey mid-rise vernacular palace which was designed with sustainability in mind. This mid-rise element of the palace communicates the vernacular architecture of TMH in Negeri Sembilan whereas sustainable designs are factored in environmentally friendly materials, construction methods, and the environmental impact of the building culturally and economically. This research was aimed at examining the sustainability approach of Istana Lama Seri Menanti as a mid-rise vernacular palace in the early 20th Century, and its impact on the current generation after 109 years. The research methodologies include case and precedent studies of vernacular palaces in Malaysia as well as interviews with experts in the field. In conclusion, the architectural sustainability of Istana Lama Seri Menanti had taken into account timber availability, consumption of naturally available resources, designs with minimal environmental impact and high cultural importance in the building design with the ultimate aim of conserving it for future generations.

Keywords: Mid-rise palace architecture, sustainable architecture, vernacular palace architecture

ARTICLE INFO

Article history:
Received: 29 September 2016
Accepted: 05 April 2017

E-mail addresses:
nurdiyana.za@gmail.com (Nurdiyana Zainal Abidin),
jesz199@yahoo.co.uk (Raja Nafida Raja Shahminan),
strazawaf@gmail.com (Fawazul Khair Ibrahim
*Corresponding Author

ISSN: 0128-7680

INTRODUCTION

Traditional Malay Royal Palaces (TMRP) in Malaysia have a unique vernacular architecture, which gives an insight into the traditions and culture of the rulers in the old days (Md, Nurul & Nik, 2013). The TMRP was not only a place of residence was also an administrative and Islamic centre to expand

the reach of Islam (Hazrina et al., 2012; Ossen et al., 2010; Hairuddin et al., 2008). Vernacular palace architecture in Malaysia was designed to be low-rise timber palaces of not more than two storey's high as they were replicas of the Traditional Malay Houses (TMH) but on a bigger scale and size (Yaakub, 1996; Zulayti, 2009). However, Istana Lama Seri Menanti is a mid-rise vernacular palace of four storeys which resonates with the architecture of Traditional Malay Houses in Negeri Sembilan (Gibbs, 1987). It was built in the early 20th century using traditional construction methods and materials (Sheppard, 1969). The aim of this research is to investigate the sustainable design of Istana Lama Seri Menanti through research methodologies which include case and precedent studies of vernacular palaces in Malaysia and interviews of experts. The scope of the study revolves around Traditional Malay Royal Palaces built between late 1800s and early 1900s (Istana Lama Seri Menanti was built between 1902 and 1908). Case and precedent studies are limited to timber palaces in Peninsular Malaysia and not masonry palaces.

Sustainable Vernacular Architecture

Vernacular architecture is an important sustainable design due to several factors which include passive design usage, economical value and cultural value of the design (Lawrence, 2006). Passive design elements are important in sustainable building designs because of its low impact on the natural environment as it takes into consideration local climatic elements. For example, as Malaysia is a tropical country, the hot and humid weather is an important factor in determining the design features of a building through natural ventilation (cooling), natural sunlight and the movement of air and heat (high roof and raised stilts). A sustainable building design also has a high cultural value as it represents the community and culture (Lawrence, 2006).

Sustainable architecture also allows for the economical aspect of the building to be considered as cost of construction affects the sustainability of the building. As such, local materials, expertise and methods contribute to the sustainability of the building through minimising the cost of transportations and manual labour. Hence, vernacular architecture reveals the identity of the local community through designs of its environmental, social and economic values. Figure 1 shows the importance of sustainable design.

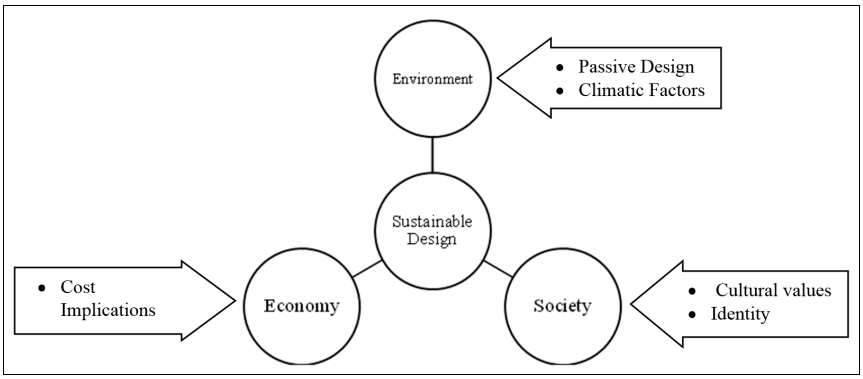

Figure 1. Factors influence sustainable design

Traditional Malay Vernacular Architecture

Traditional Malay Vernacular architecture relates to the surrounding areas of the buildings as environmental factors are important when designing a traditional Malay home or a palace. The environmental factors include the climate, materials used and also user friendliness (Yuan, 1987). Due to the tropical climate which has high humidity, the Traditional Malay House is designed with many passive design elements so that the house is cooler and there is sufficient natural lighting. Furthermore, the use of natural construction materials reduces building costs. Figure 2 is an adaptation of an illustration (Yuan, 1987) depicting the climatic design of the Malay House.

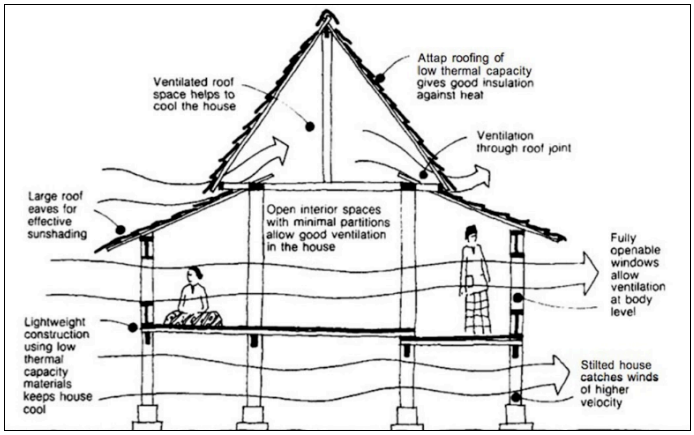

Figure 2. Diagram adapted from Yuan (1987)'s climatic design of the Malay House

Istana Lama Seri Menanti

Istana Lama Seri Menanti is a mid-rise timber palace commissioned by Tuanku Muhammad Shah ibni Almarhum Tuanku Antah who was the 7th Yamtuan of Negeri Sembilan (Sheppard, 1969). The palace was built in order to replace Istana Pulih which was burnt down during the Bukit Putus War in 1875. Istana Lama Seri Menanti was built in 1902 and was completed in 1908 by Tukang Kahar and Tukang Taib who were appointed by Tuanku Muhammad as the designer and builder of the palace (Sheppard, 1969; Khan, 1983). The timber used for the construction was harvested from nearby forests in Negeri Sembilan and the four-storey palace was built using traditional methods without the reinforcements of steel (Yaakub, 1996). Chinese contractors were also involved in the construction while a British draftsman provided the drawings of the palace. Figure 3 shows the front elevation of the current Istana Lama Seri Menanti.

Figure 3. Front elevation of Istana Lama Seri Menanti

The palace was designed to be four storey's high which makes it a mid-rise timber palace of the 20th century during which other palaces have been constructed using masonry constructions. The spatial layout of the palace was well organised and spaces were specifically designated which differed from traditional Malay layouts that are more multi-functional. The symmetrical layout of the spaces were also uncommon in the Malay design. Figure 4 illustrates the spatial layout of spaces within Istana Lama Seri Menanti.

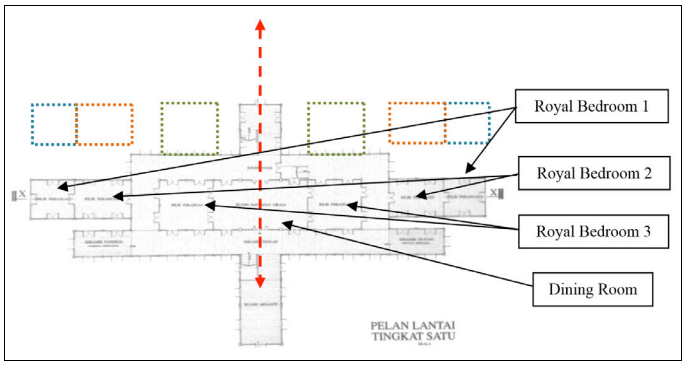

Figure 4. First Floor Plan of Istana Lama Seri Menanti (KALAM, 1993)

MATERIALS AND METHODS

This was a qualitative research based on empirical and historical studies. The empirical research encompasses case studies and earlier studies of TMRP in Peninsular Malaysia focusing on palaces built around the 1800s until the 1900s whereas historical studies include archival research to collect primary and secondary data from the National Archives and London National Archives. Timber and masonry palaces were also examined in order to get a physical analysis on the architectural types of TMRP found in Malaysia and the timeline of the gradual change of timber palaces towards the newer and more modern masonry palaces. Figure 5 is a description of TMRP in Peninsular Malaysia with a specific focus on palaces in Negeri Sembilan.

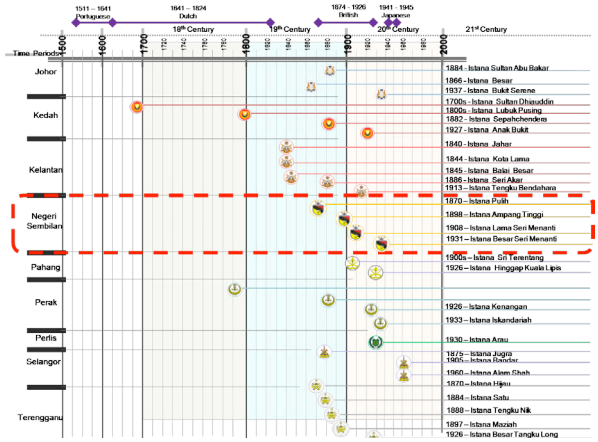

Figure 5. Case studies and precedent studies of TMRP in Peninsular Malaysia

RESULTS AND DISCUSSION

From the list of TMRP in Malaysia, several buildings were selected based on the availability of information such as pictorial evidence, the year it was built and the materials and methods used. From the early 1800s, palaces built were made from timber but by the middle of 19th Century, masonry replaced the traditional construction methods. This coincides with the arrival of western colonial powers in Malaysia and the subsequent British occupation at the end of the 9th Century. However, in Negeri Sembilan, Istana Lama Seri Menanti, a timber palace, was built in the modern era of the 20th Century with sustainability in mind during which masonry palaces were common. Figure 6 illustrates the selected TMRP for case and earlier studies during 1800s-1900s showing the shift in architecture from timber to masonry.

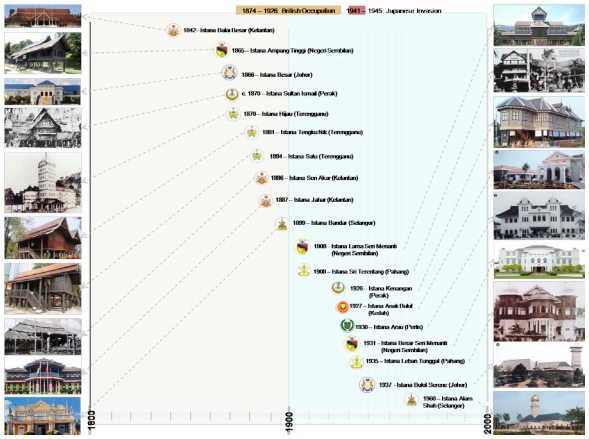

Figure 6. Selected case and precedent studies of TMRP in Malaysia during 1800s - 1900s and the changing construction materials and methods

The findings of this research indicate environmental, economic and social factors combine to influence the architecture of TMRP. Environmental factors in the sustainable design of Istana Lama Seri Menanti include both construction materials, methods and passive design elements. Passive designs for Istana Lama Seri Menanti include sun shading and veranda, natural ventilation louvers and openings for natural lightings. The mid-rise four-storey building also allows for the release of heat through the upper floors and the cooling of the lower floors through natural ventilations. Figure 7 illustrates passive design factors in the architecture of Istana Lama Seri Menanti.

Figure 7. Images illustrating the passive design features of Istana Lama Seri Menanti

The timber used for the construction was harvested from local forests in Negeri Sembilan and transported to the site. The construction of the palace was done by local craftsmen, hence, incurring minimal cost in terms of transportation and materials as the latter was harvested and transported locally. The social factors in the sustainable design of Istana Lama Seri Menanti include the cultural factors of the locals, cultural value of the design and implications on the locals. Cultural influences relate to the vertical planning of the palace as it is common for TMH in Negeri Sembilan to have two or three floors. Hence, the mid-rise construction of the palace is an identity of the TMH in Negeri Sembilan but on a grandeur and larger scale. Figure 8 illustrates the axonometric diagram of Istana Lama Seri Menanti and the impact of the passive design.

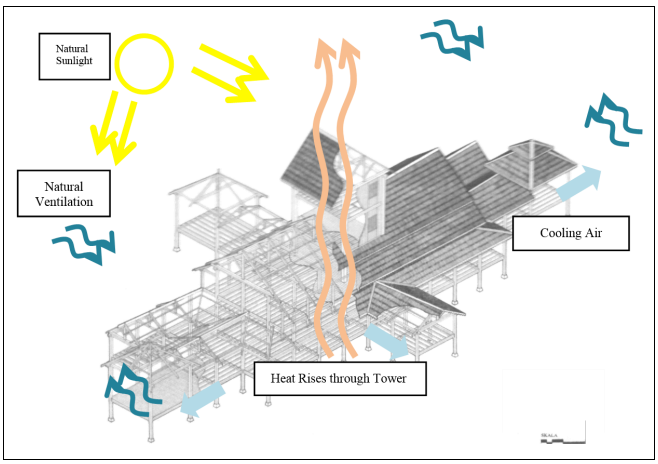

Figure 8. Passive Design of Istana Lama Seri Menanti

CONCLUSION

In conclusion, it is essential to understand that vernacular palace architecture was important in the old days where the rulers or royalties were leaders of the state. As a sustainable vernacular palace, Istana Lama Seri Menanti is a distinctive TMRP especially since it was built in the early 20th Century. The sustainability of the palace is seen in details of the design such as the use of passive design elements, the high cultural value of the palace architecture and the economic value of the palace. Hence, a magnificent mid-rise vernacular palace was born it the turn of the 20th century and it is still standing today. It is recommended that further research is carried out on the scope of vernacular palace architecture in Malaysia and the reasons behind the 'demise' of these unique buildings in the 20th century.

ACKNOWLEDGEMENT

The authors express their appreciation to Ministry of Higher Education Malaysia (MoHE) for the MyPhD Scholarship under the MyBrain15 program.

REFERENCES

Gibbs, P. (1987). Building a Malay House. Singapore: Oxford University Press.

Hairuddin, L. M., & Che, A. A. (2008). Islam dalam Perlembagaan Malaysia: Kewajarannya berdasarkan faktor kesultanan melayu. *Journal of Ethics, Legal and Governance (REKAYASA), 4*, 1-12.

Hazrina, M. H., Farhana, R. M., & Sulaiman, K. (2012). Pengaruh Islam dalam politik dan senibina pentadbiran pada zaman kesultanan melayu Melaka. *Jurnal Teknologi (Sciences & Engineering), 58*, 85-88.

KALAM. (1993). Istana Lama Seri Menanti. *Measured Drawings*. Universiti Teknologi Malaysia.

KALAM. (1993). Istana Lama Seri Menanti. Measured Drawings. UTM.

Lawrence, R. J. (2006). Learning from the vernacular: Basic principles for sustaining human habitats. In: Asquith, L. and Vellinga, M. (ed.). *Vernacular Architecture in the Twenty-first Century. Theory, Education and Practice*. Milton Park, Abingdon: Taylor & Francis.

Md, R. M., Nurul, S. H., & Nik, D. A. (2013). The concept of 4d capturing: Digitizing the history of Istana Jahar, Kota Bharu, Kelantan. *The 8th International Symposium on Digital Earth: Transforming Knowledge into Sustainable Practice.* Kuching: 8th ISDE 1-8.

Ossen, D. R., Aziz, Z. A., & Idid, S. Z. (2010). The islamic malay traditional towns: Learning through the attributes - special emphasis on Johor Bahru, Malaysia. *First International Conference for Urban and Architecture Heritage in Islamic Countries: Its role in cultural and economic development*. Saudi Arabia: Saudi Comission for Tourism and Antiquities.

Sheppard, M. (1969). Malay palaces of the past: Part one. *Malaya in History, 8*(1), 21-25.

Yaakub, I. (1996). Rumah tradisional Negeri Sembilan. Shah Alam: Penerbit Fajar Bakti Sdn. Bhd.

Yuan, L. J. (1*987). The Malay house: Rediscovering Malaysia's indigenous shelter system.* Institut Masyarakat. Pulau Pinang.

Zulayti, Z. (2009). Seni bina melayu Semenanjung: Mencari asas seni bina national. *Jurnal ASWARA*. 63-80.