Sustainability in Architectural Conservation of Heritage Building: A Qualitative Approach

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Abstract While there are many heritage buildings with over 50 years of age in Malaysia, many are then left abandoned to decay. It is clear that given proper planning and consideration for conserving these existing structures, we are presented with opportunities for adaptive reuse of buildings well designed to respond to the environment through passive means, without the need to demolish or clearing the existing green sites for new constructions. However, conservation of heritage architecture is not often discussed as part of the sustainable movement of architecture. This paper will discuss the process and aspects of architectural conservation in Malaysia and its relevance to the green building guideline.

Keywords Conservation · Heritage · Architecture · Sustainability · Bangunan Sulaiman

1 Introduction

The idea of sustainable development started surfacing in the mid-1900s as scientists began shedding lights on the pressing issue of environmental pollution crisis. With that, the concept of green building and green building rating tools came about with UK pioneering through BREEAM.

At the mention of sustainable architecture, most will immediately relate it to building energy performance and building design strategies: passive strategy through

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means of vernacular strategy, active technology, and innovation that emphasizes on renewable energy and energy efficiency. However, design is only one out of many aspects encompassed in the concept. Sustainable architecture takes into account all aspects of a building's life cycle from design, construction, operation, and maintenance to demolition, and analyses the process at every stage on its impact on the environment. It is about the selection of materials, the method materials sourced, the logistical aspect of transporting the materials to site, and finally, how much carbon footprint is imposed throughout the life cycle of the building.

> The greenest building are the ones that are already built [1].

In this context, Malaysia being the colony of many countries prior to its independence houses many heritage buildings with other countries' influences, many of which are left derelict and unmaintained. Given proper maintenance and planning of use to the size of existing buildings, the adaptive reuse of heritage buildings would significantly reduce the impact on the environment by eliminating the process of demolition and the planning and clearing of sites for new buildings. This paper will focus its discussion on the sustainability of architectural conservation throughout the process of conservation in the stage of construction works in Malaysia.

2 Literature Review

2.1 Architectural Conservation

Conserving national heritage assets and places retains and provides sense belonging to the people in a built environment. Sense of belonging, shared heritage, and historical background in a diverse cultural society such as Malaysia are crucial in bringing citizens together which contribute to nation building [2]. Each nation has its 'historic buildings' that represent its past. Historic buildings are directly linked to nationalism, through their roles in building and reinforcing national identity. Despite their physical existence, historic buildings are 'created' rather than given: they must be constructed as 'historic', through processes of choice and the attachment of significance [3].

One of the principal functions of heritage interpretation is to enhance the visitor's sense of place and place identity. If this is to occur, the interpretation should be planned and designed with that outcome in mind [4]. The real heritage value is not just in the physical structure, but in the stories that are part of that building and its surroundings. Heritage building conservation is no exception, which essentially comprises the physical evidence of our environment that symbolizes the tangible cultural identity and heritage of the nation. In the case of Malaysia, it is a means of affirming our national heritage and promoting solidarity, thus providing the means of satisfying a wide variety of aspirations. The Malaysian government initiates relevant legislations and enforcements as they play important roles in conservation of heritage buildings to safeguard the spirit and identity of the nation.

Linkage to past glories is often connected to using historic buildings as national rallying symbols in the face of external threats. Wars and invasions have seen remarkable changes in policy, as historic buildings of the previous opposed regimes or internal groups become adopted as national symbols [3]. Hence, architectural conservation is an important effort to sustain the historical narration of the city's existence.

2.2 Life Cycle Assessment of Heritage Building

The true concept of conservation is preserving the authenticity of the heritage based on the original or historical evidence. Authenticity is a process or desire to reveal the true nature of an object. The United Kingdom Guidance for Practice defines conservation as the means by which the true nature of an object is preserved. The true nature of an object includes evidence of its origins, its original construction, and the materials by which it is composed and information as to the technology used in manufacturing [5].

Heritage presents itself in both tangible and non-tangible forms as a narrative of a nation. In the context of architecture, heritage building is a monumental representation of a country in its identity, history, and culture—through style of architecture, as a form of memory and reminder of historical events that formed the nation that we are today. Conservation can be seen as an effort to prolong the operational timeline of a building, as well as an effort to maintain nation's identity.

Building and structure gazettes as heritage are those that hold the value of history or culture for more than 50 years. Given such, when technology and innovation were not as advanced before the 1960s, buildings would rely solely on passive means of design to achieve optimum indoor environmental quality of lighting and temperature condition [1].

2.3 Case Study: Bangunan Sulaiman

Bangunan Sulaiman is one of the last three in the series of heritage buildings which were constructed in Kuala Lumpur by the British. It is significant as an important architectural heritage to our nation due to its location in the context with Kuala Lumpur Railway Station, the current Majestic Hotel, Kuala Lumpur Railway Office, Masjid Negara, Merdeka Square, and Stadium Merdeka, forming the prominent heritage strip in Kuala Lumpur City Centre.

The building started its operation in 1930 as the head office to Federated Malay States Railways, and it currently functions as the office for Asian International Arbitration Centre (AIAC) since its conservation in 2011 [6]. The building adopts the architecture language of art deco with implementation of simple geometrical forms

of ornaments on minimal areas of its façade expressed through clean lines and rectangular forms.

> In addition to the original building which will be refurbished, the project involves the development of new two-story car parking facility with a pavilion housing training facility on the existing open car park space to the west of the original building. To the south, at the rear end of the original building will be the two new structures – a single story open cafeteria and a five-story block which will hold lifts and a staircase [7].

3 Interview with Conservation Architect of Bangunan Sulaiman

An interview was held on 19 September 2018, at the interviewee's office in PJU with the objective of understanding the process and challenges faced in the conservation of Bangunan Sulaiman. The researchers presented the following questions to Ar David Cheah, the architect involved in Bangunan Sulaiman's conservation:

Research questions	Significant notes from the answers
What is the role of the architect in the conservation of Bangunan Sulaiman?	• Visitation and study of selected heritage building • Restoration of building to original drawings from national archive while ensuring interior planning is suitable for current usage • Build a car park block next to Bangunan Sulaiman to increase the functionality of building
What are the problems faced in the conservation and the solutions taken?	• Constraint due to limited budget for high-cost building restoration • No physical contact allowed between heritage and new structures, exterior to remain unchanged • New structure required by DBKL to respond to heritage building while not outshining to respect its authenticity • Worker's lack of knowledge on specialized construction technique for specified building materials to match the original building that are often acquired from overseas
What is the relationship and importance between heritage conservation and the nation? What is the role of heritage architecture towards nation building in Malaysia	• Heritage building is of historical value to our country, thus the need for conservation • As aspect of tourism to boost the country's economy • Architecture as narration to represent our identity • Modern examples of architect contributing to nation building in Malaysia are Hijjas Kasturi and Ken Yeang

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Research questions	Significant notes from the answers
What are the suggestions to strengthen the awareness and pride in heritage building among our nation?	• Educate the young generation, students, as well as public through adaptive reuse and experiential activities • Architects should design better or flexible space and function for the heritage buildings in order to increase the public engagement and awareness to allow the users or future users to appreciate the heritage building • Heritage bodies and authority to align and strengthen the conservation policy

4 Methodology

This study adopts qualitative strategy to acquire secondary data and analyses them through descriptive analysis. Research through journals and literature reviews is selected via online and Chen Voon Fee Resource Centre at Badan Warisan Malaysia using keywords of heritage and conservation. Text analysis is then applied to examine contents relevant to the architectural conservation in Kuala Lumpur and its relation to sustainability towards environment and the nation. Bangunan Sulaiman is selected as the case study to analyse the sustainability throughout its approach of architectural conservation. Data on Bangunan Sulaiman is collected through site observation through visitation and interview with the conservation architect of Bangunan Sulaiman, AR. David Cheah. The final results are discussed at the end of this paper.

5 Results and Discussion

While there are many heritage buildings with over 50 years of age in Malaysia, many are then left abandoned to decay. It is clear that given proper planning and consideration for conserving these existing structures, we are presented with opportunities for adaptive reuse of buildings well designed to respond to the environment through passive means, without the need to demolish or clearing of existing green sites for new construction. Unfortunately, as presented by the reality, there is a lack of attention given to the process of maintenance and restoration work, and hence, these buildings are left to be demolished when the structure decays beyond its function.

Green Building Index, while it should not be the limiting guideline to sustainable construction, is undeniably a benchmark that professionals in the construction industry refer to measure the sustainability of their building projects. As we take a look at the categories in Green Building Index (GBI), while there are categories

listed for existing buildings, the breakdown is without consideration to the intricate requirement expected for the gazetting of heritage buildings. Putting aside the intangible narratives in the expectation of society and culture that ties a building to any historical events, for a building to be gazette as heritage, it must retain to its true nature. It must retain to good design or aesthetical characteristics that is the architectural elements and features of original design, construction, and material that represent its respective historical event.

By making a comparison between the requirements of Green Building Index rating tool and National Heritage Department, the contradiction which would not allow the eligibility of heritage buildings is not allowed to be rated green or sustainable in Malaysia as shown. This indicates that there is a gap in the green building guideline that could be further revisited to accommodate to heritage buildings.

5.1 Building Design and Orientation

As society advanced with technological innovation, we began relying on mechanical and technology means of solution. There are usually minor issues of overall building heat gain in heritage buildings. Issues are overcome in overall site planning and orientation of buildings to ensure minimum building surface and openings are exposed to the east–west axis of direct sun path.

Taking case study of Bangunan Sulaiman as an example, the building shows that Bangunan Sulaiman sits in a longitudinal position along the east–west sun path, thus receiving minimal sun heat gain. The plans also indicate further buffer provided by corridor surrounding the perimeter of the building. As wind travels in the south-east direction, cross-ventilation is achieved at its optimum. However, due to the function of the building for arbitration use, privacy of spaces is required and concealed.

SM5 in non-residential existing building category of GBI rating indicates that parking capacity should be achieved for sustainable site management. Site of such heritage buildings is often located in urban settings, as colonial countries develop their administrative centres and township. Heritage requirements indicate that there should be no extension to the existing structure as it differs it from its true form but additional structure may be constructed within the site of heritage building as long as it does not touch the existing structure. In cases such as Malacca where the heritage town is already congested, there is no land available nearby the site and thus, it would require a change in town planning and system to achieve parking facility to accommodate for the building function and provide proper public transportation linkage.

5.2 Building Material and Maintenance

Extracted from the interview with Ar David Cheah, it is understood that the statutory body for heritage in Malaysia requires the restoration works of the building façade to be done entirely with its original materials. More often, similar in the case of Bangunan Sulaiman, the specified materials are not available in our local context, hence requiring sourcing and purchasing from a foreign country. In this term, it has significantly reduced the sustainability of the building in the aspect of economy through the increase in overall project cost of obtaining material and impact on the environment by imposing of carbon footprint through the need of logistical solution. Labour cost will also increase as many of the restorations consist of ornaments and details that are beyond conventional construction, thus requiring skilled workers or specialists.

Besides that, as technology was not as advanced during the time of construction for buildings listed as heritage, innovation of building materials was similarly quite limited in choice. With that, materials found in the building may not be the most efficient when it comes to durability. Because of this, by emphasizing the use of exact same material and not allowing replica, it will require frequent maintenance and replacement works to the building with similar materials and hence to reduce the overall sustainability of the building in the long run.

As heritage body has strict requirements for the building façade to be entirely replicated in terms of form and materials, it is not possible to achieve MR1, MR2, and MR6.

5.3 Cultural Sustainability and Nation Building

Efforts of architectural conservation are important and significant as heritage buildings are the physical symbolism and reminder of our nation's common identity. The heritage buildings are monuments left in time of representation of our history.

While awareness of importance of architectural conservation is given effort and emphasis, the lack of funding system by the government in supporting the conservation projects and lack of skilled workers with knowledge of applying materials specified as the building's original form in Malaysia become an issue.

Besides that, heritage buildings conserved in city of Kuala Lumpur are mostly in terms of their external façade only. The lack of interaction of the people with the buildings lacks opportunity to create memory and connection to bond the people to embrace and appreciate the buildings as representation of nation's identity. Therefore, conservation of heritage buildings with proper integration and programme planning to engage people in using the spaces provided allows better appreciation of people to the buildings due to personal connection from memories created.

Once the connection is established between the people and architecture heritage, a common identity can be visualized in aid of nation building. Thus, the people will garner more will and interest to be involved in effort of architecture conservation.

6 Conclusion

Heritage architecture carries the history and memory of a country. Appreciation and connection of present users to heritage architecture inculcate the value of nation within the people. Limited research has been done to discuss the architectural conservation of the heritage and its relationship to sustainability.

Due to the conditions during the time of construction of heritage buildings, regardless of vernacular architecture or colonial architecture, the materials and design consideration of such buildings are often still used as reference for the study of passive design strategy in many schools of architecture. Given such condition, it is clear that these buildings have already achieved the concept of sustainable architecture, what more if efforts are put into proper system of maintenance and conservation to ensure the structural integrity is retained. With that in mind, buildings of function of similar capacity could adopt and reuse heritage structures; thus, the need to clear green land for new construction in achieving sustainability in overall town planning is reduced.

Besides that, sustainability is more than just the environment, and it also comprises aspects of culture, society, and economy of a country. Architectural conservation on heritage building is an important symbolism to the people of our nation, as a reminder in the backdrop of our common identity in the multicultural context and entity of Malaysia. It is crucial to the effort of nation building, to strengthen the roots of the people with these physical representations of stories heard from the history books. On the other hand, heritage-based tourism is also one of the biggest economic drivers of Malaysia.

Green Building Index Council should also work with related heritage council in developing green building rating tool, specifically for heritage buildings. This guideline should take into consideration the aspects of cultural retention in the building to ensure the narrative and representation of our history and identity remain for the purpose of nation building so that sustainability is achieved in all aspects including culture, economy, and environment. This is because such guidelines and certifications will give better encouragement to the professions in the construction industry to take part in conservation of our heritage and use their respective expertise together. Further studies may occur to find a balance and solution in solving the issues faced in sustainable architectural conservation.

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