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eISSN : 3030-5543

The 16th Regional Symposium of The Malay Archipelago

16TH SIMPORA

International Conference

Religion, Traditions and Local Wisdom

Proceedings International **SYMPOSIUM NUSANTARA**

Organised by:

Centre for Knowledge and Understanding of Tropical Architectural and Interior (KUTAI)

Universiti Teknologi MARA Perak Branch

Seri Iskandar Campus, Perak, MALAYSIA



**PROCEEDINGS OF THE 16TH REGIONAL
SYMPOSIUM OF THE MALAY ARCHIPELAGO
SIMPORA XVI: 2025**

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Diterbitkan oleh:

Unit Penerbitan UiTM Perak

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Perpustakaan Negara Malaysia

Cataloguing in Publication Data

No e- ISSN: 3030-5543

Cover Design: Richard Mareno

Typesetting : Dr Nur Huzeima Mohd Hussain

Dr Wan Faida Binti Wan Mohd Azmi

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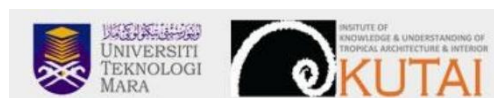
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UNDERSTANDING THE CULTURAL SUSTAINABILITY IN KEDAH

ROYAL HERITAGE: THE CONSERVATION OF MASJID ZAHIR AS A COLONIAL-ERA CULTURAL ICON

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Abstract: Masjid Zahir, located along the Kedah River in Alor Setar, stands as one of Malaysia's oldest and most architecturally significant mosques. Constructed in memory of 1,489 Muslim martyrs who perished during the Siamese invasion of Kedah in 1821, the mosque symbolizes the spiritual and historical resilience of the Kedahan people. As a landmark tied closely to the legacy of Kedah royalty, Masjid Zahir continues to represent a vital element of cultural heritage. However, there is an increasing concern over the gradual erosion of cultural values associated with the royal institution, largely due to limited community awareness and engagement in heritage conservation. This research explores the role of Masjid Zahir in sustaining the cultural identity of the local community and in reinforcing the historical significance of Kedah's royal heritage. The study employs site observation and a case study approach to examine conservation practices and the mosque's enduring cultural relevance. The findings underscore the importance of integrating heritage conservation with cultural sustainability, offering valuable insights into preserving royal heritage icons within the context of a changing society.

Keywords: Royal Heritage, Conservation, Colonial-Era, Masjid, Cultural Icon

INTRODUCTION

Heritage conservation faces increasing challenges from modernization pressures, shifts in societal values, and the rapid growth in urban development, raising concerns regarding the mosque's long-term socio-cultural sustainability. Beyond preserving their physical structures, these sites are essential in safeguarding cultural customs and collective memory. As noted by Muhammad and Rosdi (2022), heritage buildings serve not only as architectural icons but also as cultural anchors that shape social identity and continuity. In order to address these issues,

Malaysia has implemented cultural heritage policies such as the National Heritage Act 2005 and the National Cultural Policy is to preserve and promote the nation's historical sites. The significance of incorporating heritage into more comprehensive sustainable development agendas is further supported by Malaysia's dedication to the United Nations Sustainable Development Goals (SDGs) particularly Goal 11.4, which focuses on strengthening efforts to protect and safeguard the world's cultural and natural heritage reinforces the importance of integrating heritage into broader sustainable development agendas. UNESCO highlights that sustainable conservation should adopt a people-centered and inclusive approach, where cultural heritage is preserved for its historical value and actively contributes to social cohesion, economic development, and environmental sustainability (UNESCO, 2021). This is further supported by Yusof and Ibrahim (2011), who state that that well-established monumental buildings such as Masjid Zahir serve as a reflection of Islamic nationhood and provide civic and religious significance in modern urban environments.

This research will investigate the role of Masjid Zahir in sustaining Kedah's royal cultural heritage, addressing the research gap concerning cultural sustainability in colonial-era royal mosques in Malaysia. It investigates how conservation practices support the mosque's ongoing historical relevance and symbolic role in the state's royal identity. The objectives of this research are to identify the cultural and historical significance of Masjid Zahir in shaping the legacy of Kedah royalty, to examine the architectural and symbolic features that reflect the mosque's identity as a colonial-era royal icon, and to evaluate how current conservation efforts preserve Masjid Zahir's physical and cultural values while supporting its long-term cultural sustainability and heritage continuity. Despite the immense global discourse in heritage conservation, there remains a gap in research concerning the cultural sustainability of colonial-era mosques within the Malaysian context. Previous studies, including Feilden and Jokilehto (1998), Stubbs (2009), Rahman et al. (2018), and Zulkifli et al. (2021), have predominantly examined architectural styles, structural preservation, and historical narratives. However, there is a paucity of research investigating the influence of conservation strategies on the cultural sustainability of heritage sites, particularly regarding community identity, cultural continuity, and living traditions. This issue is particularly relevant in the Malay context, where mosques have historically functioned not only as places of worship but also served as community hubs that reflect the values, leadership, and traditions of Malay-Muslim society (Muhammad & Rosdi, 2022). The evolving role of Masjid Zahir within its community and its significance as a symbol of Kedah's royal and religious heritage have yet to be comprehensively explored. In order to fill these gaps, this study looks into how conservation strategies affect the mosque's cultural sustainability and suggests ways to strengthen its historical and cultural significance for future generations.

LITERATURE REVIEW

2.1 Heritage Conservation Theories and Frameworks

The preservation of historical and cultural landmarks is vital for maintaining their architectural integrity, historical relevance, and cultural significance. According to Feilden and Jokilehto (1998), conservation serves not only to protect the physical form of heritage sites but also to ensure the continuity of their intangible cultural meanings for future generations. Stubbs (2009) further supports such activities by advocating for adaptive reuse practices that integrate contemporary functions while retaining historical integrity. Such sustainable conservation approaches enable heritage sites to remain both functional and culturally relevant in changing urban contexts. UNESCO (2021) promotes a people-centered and inclusive framework for heritage conservation that connects preservation efforts with sustainable development, cultural resilience, and community participation. This approach moves beyond conventional preservation techniques by recognizing the role of communities in maintaining and transmitting cultural values across generations. Mason and Avrami (2020) present the Values-Based Approach to Heritage Conservation, positing that heritage should be comprehended through the diverse values it represents-social, spiritual, historical, aesthetic, and symbolic-rather than exclusively through its physical attributes. This approach supports a more holistic understanding of heritage and its significance to diverse stakeholder groups.

In the Malaysian context, Muhammad and Rosdi (2022) stress the importance of safeguarding both tangible and intangible cultural components of heritage sites, especially those with strong royal or religious associations. They argue that such sites must be conserved not only for their architectural or artistic merit but also for their continued role in shaping cultural identity and community cohesion. Contemporary heritage frameworks, particularly those proposed by UNESCO (2021), align closely with the United Nations Sustainable Development Goal (SDG) 11.4, which emphasizes the need to strengthen efforts in protecting the world's cultural and natural heritage. These frameworks advocate for integrated strategies that uphold the social value, symbolic meaning, and community identity of heritage places, elements that are crucial for achieving long-term cultural sustainability.

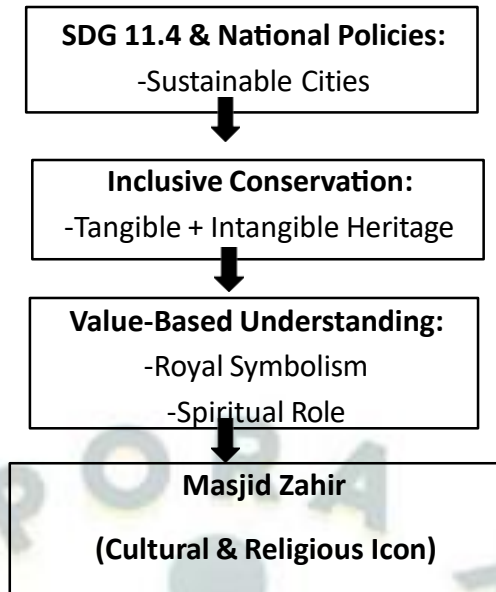


Figure 1.0: Conceptual Framework for Cultural Sustainability of Masjid Zahir

Figure 1 illustrates the conceptual framework for the cultural sustainability of Masjid Zahir, structured in a vertical flow that reflects a progressive, value-driven approach. The framework begins with broader national and global policy objectives, narrows through contextual layers of conservation and value-based interpretation, and culminates in the recognition of Masjid Zahir as a cultural and religious icon central to Kedah's royal heritage. At the foundation of the framework lies SDG 11.4 and National Policies, which emphasize sustainable cities and the continuity of cultural heritage. These global and national commitments provide the overarching vision that anchors efforts to protect historic landmarks like Masjid Zahir within broader sustainable urban development strategies.

The next level emphasizes inclusive conservation, which emphasizes the protection of both tangible and intangible aspects of the mosque's heritage. This involves preserving architectural features, Islamic calligraphy, and historical design practices while also acknowledging the importance of royal narratives, religious functions, and public memory tied to the site. Community involvement and institutional commitment are essential to ensuring that conservation efforts are aligned with heritage values and carried out authentically. The third tier introduces a value-based understanding of the mosque that focuses on its ceremonial roles, historical continuity, and symbolic link with the monarchy. This portion includes the utilization of traditional materials, architectural representation of Indo-Saracenic and Mughal influences, and preservation of its original structure, elements that demonstrate both historical endurance under colonial control and cultural pride.

The final component is Masjid Zahir, recognized as a cultural and religious icon. As one of the oldest mosques in Malaysia, it represents more than a place of worship; it stands as a tangible

embodiment of Kedah's political, architectural, and spiritual legacy. Its enduring presence affirms its role in both historical preservation and identity continuity.

2.2 Architectural Significance of Masjid Zahir



Figure 2: Physical Architectural of Masjid Zahir From the left. Masjid Zahir human perspective, close-up of arches details, Islamic calligraphy (verse of Quran), interior space of Masjid Zahir (mihrab and mimbar), Source: Author (2025)

Figure 2 which presents the mosque's architectural composition from a human perspective, along with detailed views of the arches and Quranic calligraphy. The interior shot of the mihrab and mimbar further reveals how spatial hierarchy and ornamentation reinforce its symbolic role in Islamic worship. Masjid Zahir stands as a distinguished architectural landmark, embodying a fusion of religious symbolism and colonial-era stylistic expression. Hijaz and Saa'id (2019) highlighted the mosque's adoption of Mughal-inspired features such as onion-shaped domes, chhatris (domed kiosks), and pointed horseshoe arches, all of which contribute to its iconic silhouette and cultural identity. Their study further suggests that Masjid Zahir not only exemplifies the grandeur of Kedah's royal patronage but also became a template for subsequent mosque designs in the state, reflecting a broader influence on the architectural vocabulary of Islamic religious buildings in the region.

Complementing this, Ahmad (2015) explores the historical emergence of the "Neo-Mughal" or "Moorish" architectural style within Malaysia's colonial-era mosques, placing Masjid Zahir within a wider narrative of transregional architectural development. Interestingly, while the stylistic elements appear to trace their roots to the Indian subcontinent, Ahmad asserts that many of these design motifs were in fact introduced and interpreted by British colonial architects, rather than being directly imported from India. This architectural hybridity underscores Masjid Zahir's significance not only as a religious and royal structure but also as a product of cultural negotiation during a period of colonial influence and Islamic resurgence.

Through its distinctive design, Masjid Zahir continues to symbolize the identity of Kedah's Islamic heritage and royal legacy, while also representing the broader architectural transformation of Malay-Muslim societies in the early 20th century.

2.3 Conservation Strategies and Adaptive Reuse

Adaptive reuse has emerged as a strategic approach in heritage conservation, especially for religious buildings such as mosques, where maintaining both physical integrity and cultural relevance is essential. Rahman et al. (2018) argue that adaptive reuse enables historic mosques to remain functional in modern contexts by integrating contemporary community uses while preserving their spiritual and historical essence. Importantly, they stress that any alterations must be sensitive and non-invasive, ensuring that changes appear as a natural evolution of the structure rather than disruptive modifications that compromise authenticity. Zulkifli et al. (2021) further assert that such interventions should respect the architectural and symbolic features of mosques, preserving their role as cultural and religious touchstones. Recent conservation efforts in Malaysia illustrate the potential of this strategy. For instance, the Kampung Laut Mosque Conservation Project successfully restored and relocated the mosque to its original site in Tumpat, Kelantan. According to Hanafi et al. (2023), this project not only safeguarded the mosque's architectural authenticity but also revitalized its community function, aligning with the broader goals of sustainable tourism and cultural heritage preservation.

Similarly, the adaptive reuse of Masjid Lama Kampung Tanjung Beringin in Negeri Sembilan, as explored by Syahin et al. (2020), demonstrates how conservation initiatives can revive intangible cultural practices, such as the 'Adat Bersiram' (a traditional ceremonial bathing ritual). These cases exemplify how thoughtful adaptive reuse can extend the life of heritage mosques while supporting cultural continuity, community engagement, and sustainable development. As such, integrating adaptive reuse within conservation strategies is critical for mosques like Masjid Zahir, where both architectural preservation and the safeguarding of royal and religious heritage are paramount.

2.4 Cultural Sustainability in Heritage Context

Cultural sustainability refers to the ability of cultural heritage to remain meaningful and relevant across generations by preserving not only tangible assets but also the intangible values, rituals, and collective narratives that define a community's identity. In the context of heritage conservation, this concept highlights the need to protect and promote cultural elements embedded within historical structures (Muhammad & Rosdi, 2022). Heritage sites, especially those with religious and royal significance, serve as active carriers of local memory, customs, and identity. Thus, cultural sustainability involves more than physical preservation, it requires maintaining the symbolic and functional relevance of heritage spaces within the daily lives of communities (Nasir, 2022).

2.5 Royal Heritage and Identity

In the Malay-Muslim context, royal patronage has historically contributed to the establishment of religious institutions as expressions of state legitimacy and cultural pride. Mosques commissioned or maintained by royal families often embody both religious devotion and political symbolism. Mosques such as Masjid Zahir are not only religious centers but also royal heritage landmarks that reflect the political and cultural influence of Kedah's royalty (Yusof & Ibrahim, 2011). As illustrated in Figure 3.0, the commemorative plaque at the mosque's entrance documents its historical association with the royal family, reinforcing its status as a ceremonial monument.

The patronage of such mosques by the Kedah Sultanate emphasizes their role in reinforcing state identity through Islamic symbolism and architectural grandeur (Mohd Noor & Yahaya, 2020). For instance, in Figure 3.0, symbolic spaces like Dewan Az-Zahra, which prominently features the Kedah state crest visually reinforce the mosque's function as a venue for royal-led religious and civic activities. Similarly, the Royal Dining Room reserved for ceremonial gatherings, further highlights the mosque's continuing role in hosting official functions and sustaining the royal legacy.



Figure 3: Masjid Zahir Royal Heritage From the left. Commemorative plaque, Inauguration plaque, Az-zahra Hall, Royal dining room, Source: Author (2025)

Zainal et al. (2021) examine the conservation of Masjid Diraja Sultan Alaeddin in Selangor, noting that its status as a royal mosque necessitated attention to ceremonial functions and symbolic meaning beyond structural preservation. Conservation efforts in such contexts must consider the mosque's continuing role in rituals, royal events, and community life. As shown in Figure 3.0, the inauguration plaque at Masjid Zahir serves as a material testament to its founding under royal decree, emphasizing its dual religious and political identity. Rahman et al. (2018) highlight the importance of community involvement in mosque conservation, emphasizing that active local engagement creates a sense of ownership and strengthens the socio-cultural ties necessary for long-term heritage sustainability.

RESEARCH METHODOLOGY

This research adopts a qualitative case study approach to provide an in-depth understanding of how Masjid Zahir contributes to the cultural sustainability of Kedah's royal heritage. Fieldwork was conducted on 10th May 2025 involving site observation, photographic

evidence, and structured notetaking. Observations were carried out at different times throughout the day to capture variations in use, maintenance conditions, and spatial atmosphere. To ensure objectivity and reduce observer bias, a standardized observation checklist based on cultural sustainability indicators was used. The case study method, as proposed by Yin (2018), is appropriate for exploring complex cultural phenomena embedded within specific historical, political, and social contexts. This approach allows for a holistic investigation of the mosque's physical features, symbolic roles, and conservation practices.

3.1 Site Selection

The research is conducted at Masjid Zahir, located in Alor Setar, Kedah, a prominent landmark recognized as one of the oldest and most architecturally significant mosques in Malaysia (Yusof & Ibrahim, 2011). Built in 1912 by Tunku Mahmud ibni Sultan Tajuddin Mukarram Shah, the mosque was constructed as a tribute to the fallen Kedah warriors who died during the Siamese invasion in 1821 (Nasir & Wan Hashim, 2018). Occupying an area of around 0.98 hectares, the mosque's strategic location along the Kedah River enhances its spiritual and historical significance in the state capital.

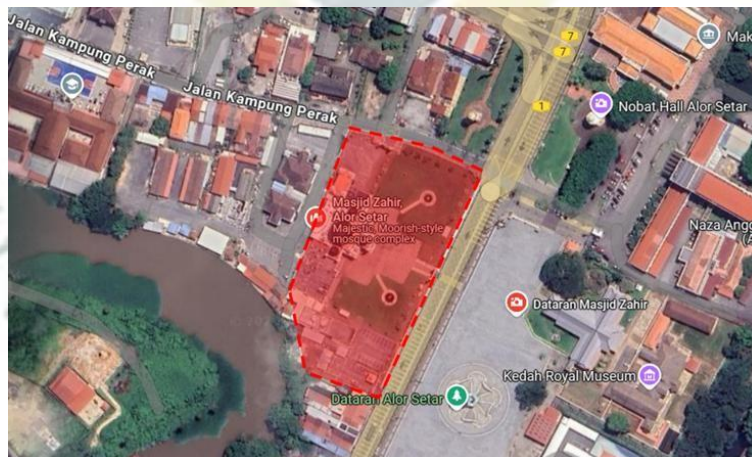


Figure 4: Location of Masjid Zahir, Alor Setar, Kedah

Source: <https://www.google.com/maps/search/map+of+masjid+zahir/>

Figure 4 illustrates the geographical location of Masjid Zahir within the urban fabric of Alor Setar, Kedah. The inclusion of this map is to provide spatial context and emphasize the mosque's strategic position along the Kedah River, near administrative and cultural landmarks. This positioning emphasizes accessibility and prominence inside the city, which supports its historical and cultural value as a royal mosque and helps to explain factors that contribute to its continuous use, visibility, and influence on local identity. Masjid Zahir was selected as the main case study using purposive sampling due to its close ties to Kedah's royal heritage. In addition to being a place of worship, it also hosts official state festivities and the Sultan's Friday speeches. According to Zainal Abidin and Hamid (2020), its continuous use for royal religious

functions highlights its importance as a living heritage site. It is also distinguished as a colonial-era mosque that has maintained both its original structure and spiritual significance by its distinctive Mughal-inspired architecture, especially the recognizable black domes and minarets.

Compared to other colonial-era mosques such as Masjid Jamek in Kuala Lumpur or Masjid Kapitan Keling in Penang, Masjid Zahir stands out due to its deep-rooted royal associations, its location in a state capital with a strong Malay-Muslim identity, and its uninterrupted use as a functioning mosque (Yusof & Ibrahim 2011). Masjid Zahir is significant because it symbolizes the Malay Islamic monarchy and plays a crucial role in upholding Kedah's traditional Islamic values and identity. Masjid Jamek serves as a representation of British Indian colonial architecture in an urban metropolis and Masjid Kapitan Keling represents Tamil Muslim merchant heritage in a multicultural port city (Abdullah & Mohamed 2019). Muhammad and Rosdi (2022) emphasize that royal mosques such as Masjid Zahir play a vital role in preserving intangible cultural heritage by maintaining the continuity of religious traditions and communal practices over time.

3.2 Key Observation Elements

Table 1 outlines the observation checklist used to guide systematic data collection throughout the fieldwork. This study relies on on-site visual observation and photo documentation to capture the essential characteristics of Masjid Zahir. The checklist helps ensure that significant architectural, cultural, symbolic, and physical features are consistently documented, supporting a detailed interpretation of the mosque's contribution to the preservation of local cultural identity. Data collection will be conducted during site visits on the 10th of May 2025, within daytime hours, allowing for real-time observation of the mosque's architectural elements and cultural functions.

Table 1: Key Observation Elements

Section	Element to Observe	Description	Purpose
Physical, Architectural & Landscape Features	Physical Architecture	Arches, domes, columns, minarets; traditional materials; signage; cleanliness	Assess architectural integrity and conservation status
	Hardscape Elements	Stone paths, fences, water features, benches, signage	Observe tangible infrastructure supporting mosque use
	Softscape Elements	Trees, ornamental plants, grass, herbs	Measure harmony with heritage landscape and natural surroundings
Conservation & Heritage Management	Visible Conservation	Signage about work, scaffoldings, official boards	Indicates transparency and seriousness of conservation efforts
	Institutional Collaboration	Presence of heritage/royal authorities	Checks on formal involvement in sustaining heritage
	Public Heritage Education	Pamphlets, QR codes, exhibitions	Promotes awareness and inclusivity in heritage learning
	Visual Integrity	Unobstructed views, well-lit architecture	Assesses aesthetic and visual preservation in urban context

Architectural Continuity & Adaptive Use	Building Continuity	Original roof, domes, minaret still preserved	Verifies authenticity and historical integrity
	Modern Additions	LED lights, modern signage	Evaluates adaptive reuse compatibility
	Interior Authenticity	Traditional interior layout/design	Reflects value of preserving intangible spatial heritage
	Neo-Mughal	Onion domes, arches, minarets	Assess stylistic identity and colonial-era influence
	Decorative elements	Calligraphy, geometric patterns, motifs	Document symbolic Islamic expressions
	Interior details	Mihrab, mimbar, structural columns, lighting	Examine spatial hierarchy and religious significance
	Materials used	Plaster, marble, timber, tiles	Assess historical authenticity and material preservation
Cultural Significance	Royal emblems or inscriptions	Signage, plaques, flags	Highlight connections to Kedah royalty
	Commemorative elements	Tombs, historical plaques, dedication markers	Reinforce spiritual and historical narratives
	Presence of traditional rituals or symbolic markers	Royal prayer ceremonies, Quran recitation programs, Royal emblem	Capture intangible cultural heritage elements

		or crest display, Historical plaques or inscriptions	
Sustainability Indicators	Water and energy systems integration	Rainwater Harvesting System, Solar PV Panels for Electricity	Observe environmental sustainability practices
	Accessibility features	Ramps, pathways for elderly	Assess inclusivity and universal access design
	Use of natural ventilation or lighting	Presence of large windows, open arches, high ceilings, ventilation grilles	Evaluate climate- responsive architectural practices

3.3 Data Analysis

This study uses ATLAS.ti 24, a qualitative analysis program intended to make theme coding and content interpretation easier, for data analysis. The program was used to import field notes and photographic data from the site visit, which were then methodically classified according to pre-established and developing themes. These themes include architectural integrity, symbolic representation, conservation practices, and cultural continuity. Through this process, the software enabled the identification of recurring patterns, spatial observations, and cultural indicators that reflect Masjid Zahir's role in preserving royal heritage and supporting cultural sustainability. The use of ATLAS.ti 24 ensures a structured, transparent, and reproducible approach to qualitative analysis, enhancing the credibility of the findings.

ANALYSIS AND DISCUSSION

Based on the structured site observations conducted at Masjid Zahir, a thematic analysis was developed by categorizing findings into five (5) key observation elements, which are Physical, Architectural & Landscape Features, Conservation & Heritage Management, Architectural Continuity & Adaptive Use, Cultural Significance, and Sustainability Indicators.

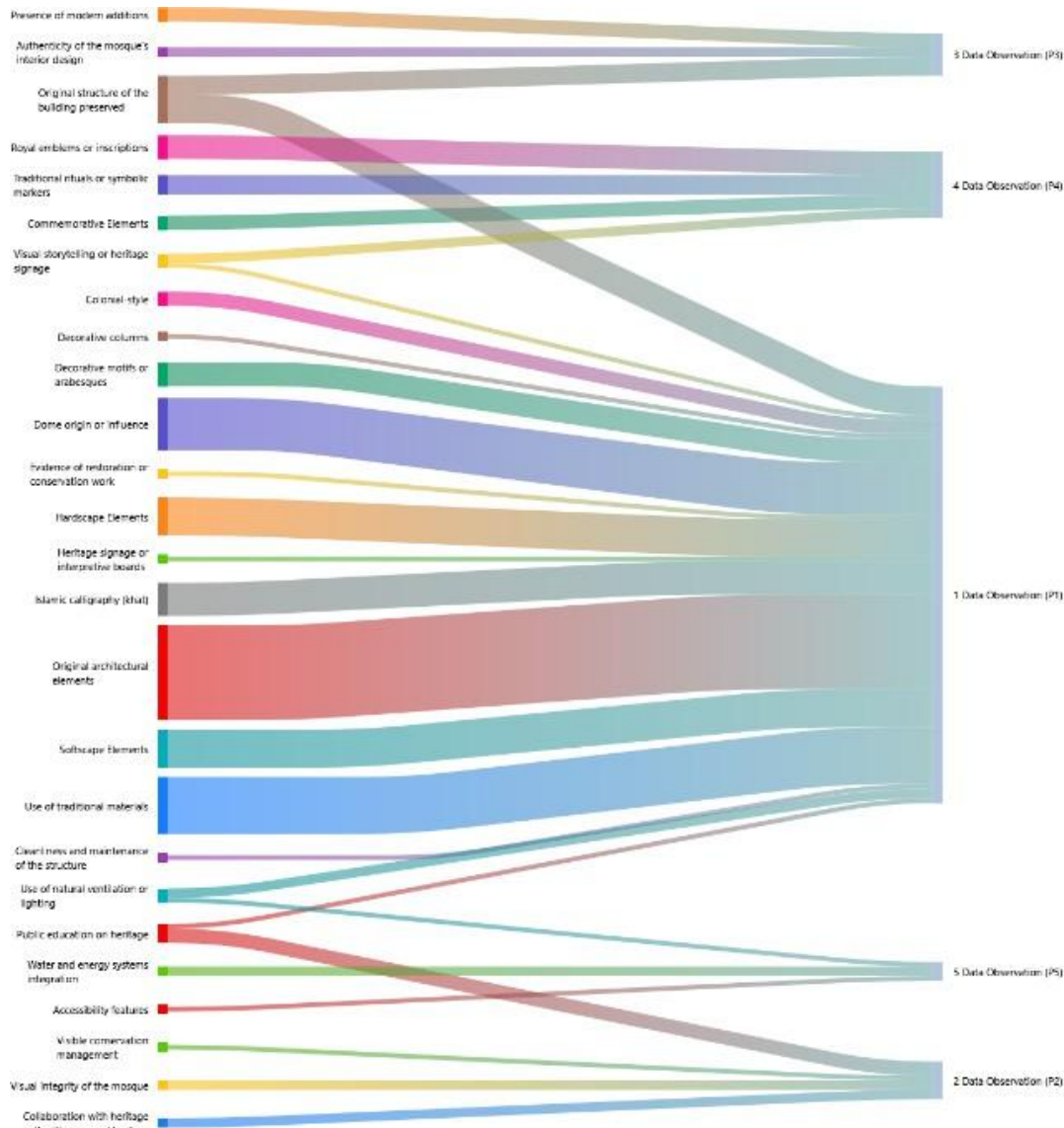


Figure 5: Pattern analysis

From Figure 5, the data collected through structured field observation was analyzed using thematic analysis, enabling a systematic approach to identifying and organizing recurring patterns across the five key observation themes. This method facilitated the development of meaningful codes, which were then clustered into broader thematic categories relevant to the cultural and architectural significance of Masjid Zahir. Thematic analysis also supported the clear visualization of interrelated ideas, enhancing the interpretation of how the mosque contributes to the socio-cultural sustainability of Kedah's royal heritage.

Table 2 represents the key physical, architectural, and landscape elements observed at Masjid Zahir, assessed using a qualitative rating scale ranging from 1 (poor) to 5 (excellent). Each sub-element was evaluated based on criteria such as authenticity, material integrity, conservation efforts, visual and symbolic significance, and overall condition.

Table 2: Key Observation Elements Observed

Sub-elements	Rating	Remarks
PHYSICAL, ARCHITECTURE AND LANDSCAPE FEATURES		
i) Original architectural elements (arches, domes, columns, minarets)	5	The arches are of the pointed multi-foliated type. The dome resembles a large onion, influenced by Middle East (Khartoum, Egypt) and North Sumatra. Similar to Aziziah Mosque in Langkat Sultanate. Columns influenced by Greek Corinthian style with acanthus leaf motifs. Minaret built from the start, topped with an umbrella-shaped tower. Strong Middle Eastern and Mughal influences.
ii) Use of traditional materials (wood, stone, tiles)	5	Original floor tiles are white marble (main hall) and black marble (additional space). Wood carvings and traditional stonework are preserved.
iii) Evidence of restoration or conservation work	5	The original structure and spatial arrangement remain intact. Restoration preserved authenticity with minimal modern intervention.
iv) Cleanliness and maintenance of the structure	5	Maintained in good condition with excellent cleanliness.
v) Heritage signage or interpretive boards	5	Mosque monument and interpretive board available, explaining history and design.
vi) Colonial-style floor tiles or wall tiles	5	White and black marble floors; geometric patterned wall tiles fixed individually. Arabesque patterns decorate walls.
vii) Decorative columns with Indo-Saracenic/Mughal influence	5	Indian-inspired design with Corinthian column bases and acanthus leaf carvings.
viii) Islamic calligraphy (khat) in interior/exterior detailing	5	Features Quranic verses (Surah At-Taubah, Surah Al-Jumuah). Calligraphy in Thuluth (interior) and Kufic (exterior). Engraved on arches, mihrab, and hardwood.
ix) Decorative motifs or arabesques (floral, geometric)	5	Floral (acanthus) and geometric Moorish/Mughal patterns. Mihrab carvings include seashell and geometric motifs. Colorful Arabesques on walls.
x) Dome origin or influence (British, Indian, Siamese, Sumateran)	5	Onion-shaped dome, influenced by Middle East and Sumatra, resembling Aziziah Mosque (Langkat Sultanate).
HARDSCAPE ELEMENTS		
i) Stone pathways, walkways	5	Stone pathways around ablution area, fountain, and mosque compound.
ii) Entrance arches or fences	5	Gateway built in 1912, retains arch style. Geometric fence design with dome shapes.
iii) Decorative pools or fountains	5	Two water fountains, front right and left of mosque.

iv) Stone seating or benches	5	Several stone benches located around the mosque area.
v) Informational signboards	5	Informational boards near entrance explaining history and architecture.
SOFTSCAPE ELEMENTS		
i) Shaded trees or canopy trees	1	Only palm and date palm trees present; lacks shaded canopy trees.
ii) Ornamental plants (flowers, bonsai)	5	Bonsai and bougainvillea pots arranged around mosque.
iii) Natural grass lawn	5	Natural grass lawn maintained in mosque compound.
iv) Herbal or traditional plants	1	No herbal or traditional plants present.
CONSERVATION AND HERITAGE MANAGEMENT ASPECT		
i) Visible conservation management (notice boards, info about works)	5	Notice boards announce maintenance and upgrading work closures.
ii) Collaboration with heritage authorities or royal bodies	3	Not listed in National Heritage List under Act 645, but recognized as royal mosque and historic landmark.
iii) Public education on heritage (pamphlets, QR codes, exhibitions)	5	Mosque monument, interpretive board, and info counter display history, architecture, and archival images.
iv) Visual integrity of the mosque (unobstructed view, lighting)	5	Mosque domes, minarets, and façade clearly visible without obstruction; good lighting enhances visual prominence.
ARCHITECTURAL CONTINUITY & ADAPTIVE REUSE		
i) Original structure of building (roof, dome, minaret) preserved	5	Original features preserved; dome color changed over time due to weather. Minaret retained since original construction.
ii) Presence of modern additions (LED lighting, modern signage)	5	LED lighting enhances dome and arches at night. No commercial signage.
iii) Authenticity of mosque interior design maintained	5	Interior retains original layout, mihrab, mimbar, calligraphy, and columns.
i) Royal emblems or inscriptions (signage, flags, plaques)	4	Inauguration plaque, state flag, royal parking signage, Sultan's dining room signage, and Kedah State Coat of Arms in mosque facilities.
ii) Commemorative elements (tombs, plaques, markers)	5	Built on burial site of Muslim martyrs. Historical poem plaque above main entrance.
iii) Presence of traditional rituals or symbolic markers	5	Venue for royal religious ceremonies, including Friday prayers. Inaugurated in 1915 by Sultan Abdul Hamid Halim Shah.

iv) Visual storytelling or heritage signage	5	Monument, interpretive board, and info counter panels include historical narratives and mosque development.
i) Water and energy systems integration	3	Solar-powered streetlights installed; no rainwater harvesting system.
ii) Accessibility features (ramps, walkways, elderly access)	5	Equipped with ramps, walkways, designated areas for elderly/wheelchair users; wheelchairs available.
iii) Use of natural ventilation or lighting	5	High ceilings, windows with blue-white geometric glass allow natural light and ventilation.
ARCHITECTURAL CONTINUITY & ADAPTIVE REUSE		
i) Visible conservation management (notice boards, info about works)	5	Notice boards displayed on the mosque door announce temporary closure of the royal mihrab, second mihrab, and women's prayer room for maintenance and upgrading works.
ii) Collaboration with heritage authorities or royal bodies	3	Not officially listed in the National Heritage List (Act 645), but recognized as the royal mosque and the oldest historic mosque in Malaysia.
iii) Public education on heritage (pamphlets, QR codes, exhibitions)	5	Religious pamphlets available. Mosque monument, interpretive boards, and information boards at the entrance and information counter provide details on history, architecture, and spatial features.
iv) Visual integrity of the mosque (unobstructed view, lighting)	5	The mosque's domes, minarets, and façade remain clearly visible from surrounding areas with no modern obstructions.
CULTURAL SIGNIFICANCE		
i) Original structure of the building (roof, dome, minaret) preserved	5	The original structure is preserved. The dome, originally brown, has darkened to black due to weathering. Influenced by Middle Eastern and Indian (Mongol) architecture. The minaret, built from the beginning, is still intact.
ii) Presence of modern additions (LED lighting, modern signage)	5	LED lighting has been installed at the dome base and entrance arch, enhancing night visibility. No modern or commercial signage observed.
iii) Authenticity of the mosque's interior design maintained	5	Interior layout remains unaltered. The main prayer hall retains its original mihrab, mimbar, Islamic calligraphy, and ornate columns.
SUSTAINABILITY INDICATOR		
i) Royal emblems or inscriptions (signage, flags, royal crest, official plaques)	4	Inauguration plaque at the main entrance. State flag near the entrance. Royal parking signage and "Bilik Santapan Kebawah Duli Yang Maha Mulia Tuanku Sultan Kedah" signage. Kedah State Coat of Arms displayed in Az-Zahra Hall, State Mosque Guest House, and on information boards.

ii) Commemorative elements (tombs, historical plaques, dedication markers)	5	No tombs on-site, but the mosque was built on the burial site of Muslims martyred during the Siam invasion. A historical poem plaque with verses is immortalized above the main entrance.
iii) Presence of traditional rituals or symbolic markers (royal prayer ceremonies, Quran recitations, religious traditions)	5	Venue for official royal religious ceremonies including Friday prayers. Inaugurated on 15th October 1915 (16 Zulhijah 1333) by Sultan Abdul Hamid Halim Shah, with the sermon delivered by Tunku Mahmud.
iv) Visual storytelling or heritage signage (timeline panels, maps, infographics)	5	Monument and interpretive boards explain the mosque's history and architecture. Additional information boards near the counter include history, spatial layout, and images of earlier mosques.

The study findings reveal that Masjid Zahir continues to function as a key architectural and cultural icon within Kedah's royal heritage. Through thematic analysis of field observations, five main areas were identified, physical architecture and landscape, conservation and heritage management, architectural continuity and adaptive reuse, cultural significance, and sustainability indicators. These are discussed in relation to relevant theories and comparative cases, enabling a more critical understanding of how heritage mosques embody cultural sustainability.

The physical architecture of Masjid Zahir displays prominent Indo-Saracenic and Mughal architectural features, including pointed arches, onion-shaped domes, and minarets. These characteristics go beyond mere style, they symbolize the mosque's historical connection to transregional Islamic identity and royal power. Hijaz and Saaid (2019) highlighted that these stylistic features enhance both architectural identity and the symbolic connection to Islamic authority. Additionally, Ahmad (2015) contends that the hybrid style evident in colonial-era mosques such as Masjid Zahir showcases a compromise between British colonial impact and traditional Islamic design. This hybridization is a distinctive aspect of what Feilden and Jokilehto (1998) refer to as "tangible and symbolic heritage", a fusion of physical authenticity and cultural significance. In contrast to Masjid Jamek in Kuala Lumpur, which reflects a British-Indian colonial identity with minimal royal elements, Masjid Zahir is deeply connected to the ongoing legacy of Kedah's Islamic monarchy, ensuring its architectural significance serves as a vibrant emblem of state authority.

Conservation and heritage management efforts at Masjid Zahir are clear through ongoing maintenance and visible information displays. Nevertheless, the lack of official safeguards provided by the National Heritage Act 2005 highlights a considerable deficiency. UNESCO (2021) states that legal recognition and involvement of the community are essential for the sustainable preservation of heritage. Without this official designation, conservation relies significantly on royal support and local customs, which may not be sustainable in the long

term. In comparison, Masjid Kampung Laut and Masjid Diraja Sultan Alaeddin gain advantages from organized, government-supported preservation underpinned by official acknowledgment (Hanafi et al., 2023; Zainal et al., 2021). The absence of educational resources or community initiatives at Masjid Zahir indicates a lost chance for greater public involvement, which UNESCO's people-centered framework promotes as vital for the resilience and continuity of heritage.

Architectural continuity at Masjid Zahir is largely preserved. The mosque retains its original spatial configuration and distinctive features, while subtle modern interventions such as LED lighting have been incorporated without compromising historical authenticity. This reflects what Rahman et al. (2018) and Zulkifli et al. (2021) describe as adaptive reuse—modern upgrades that serve functional needs while respecting the building's historical and spiritual values. This minimal intervention approach aligns with Stubbs' (2009) model of sustainable conservation, where modifications are harmonised with original design intent. While other heritage mosques such as Masjid Kampung Tanjung Beringin have integrated cultural revival strategies like the 'Adat Bersiram' ritual (Syahin et al., 2020), Masjid Zahir's conservation remains primarily architectural. Nonetheless, its role as a continuously used mosque reflects a living form of heritage, where preservation does not freeze the past but accommodates the evolving needs of a contemporary religious community.

The cultural importance of Masjid Zahir goes beyond its design. It still facilitates royal-led Friday prayers and various official religious ceremonies, strengthening its position as a spiritual and ceremonial venue. Yusof and Ibrahim (2011) claim that royal mosques act as tools of state legitimacy, embodying both spiritual commitment and political significance. Mason and Avrami's (2020) Values-Based Approach backs this, viewing heritage sites as significant due to their inherent social, spiritual, and symbolic values, rather than solely their physical features. In this setting, Masjid Zahir represents the persistence of Kedah's royal identity via its spatial arrangement, ceremonial roles, and incorporated symbols like royal crests and Quranic calligraphy. In contrast to Masjid Kapitan Keling in Penang, symbolizing the Tamil-Muslim merchant population in a diverse urban environment, Masjid Zahir is deeply connected to a specific Malay-Muslim royal story.

Sustainability indicators at Masjid Zahir reveal a partial alignment with contemporary conservation goals. The mosque utilizes passive environmental techniques, including elevated ceilings for airflow and ample natural light via expansive windows and arches. Nonetheless, elements such as rainwater collection, solar power setups, or other environmental improvements are lacking. This architecture differs from more recent or renovated mosques created with sustainable infrastructure considerations. Although the mosque grounds include some solar-powered lights, this is limited. Nonetheless, universal design elements like ramps and spacious entrances improve physical accessibility and correspond with the ideals of Sustainable Development Goal (SDG) 11.4, which advocates for inclusive, resilient, and

culturally rooted public areas (UNESCO, 2021). This combination of classic design and restricted contemporary inclusivity emphasizes the difficulty of incorporating environmental sustainability into heritage structures while maintaining historical authenticity.

CONCLUSION

This study has examined the role of Masjid Zahir in sustaining Kedah's royal cultural heritage and explored how its architecture, symbolism, and ceremonial functions contribute to the cultural sustainability of colonial-era mosques in Malaysia. As one of the oldest functioning royal mosques in the country, Masjid Zahir continues to operate not only as a religious institution but also as a powerful emblem of Islamic monarchy and Malay identity. Its continued relevance demonstrates how heritage structures can remain culturally significant through both architectural integrity and active ceremonial use.

A primary contribution of this study is the establishment of a conceptual framework for cultural sustainability, which situates Masjid Zahir within multiple dimensions such as essential symbolism, value-centered interpretation, inclusive preservation, and wider policy alignment. This framework provides an organized method for comprehending royal mosques not merely as tangible structures but as vibrant cultural entities with changing significance. In this manner, the research contests the traditional preservation narrative that frequently emphasizes physical restoration rather than community identity and symbolic continuity.

From a practical perspective, the study highlights multiple gaps that need to be filled to guarantee the long-term sustainability of Masjid Zahir. These consist of the mosque not being formally acknowledged under the National Heritage Act 2005, a scarcity of educational or interpretive resources, and few initiatives for public engagement. In response, the research suggests that heritage agencies implement conservation standards that are culturally aware, considering both physical aspects like structural characteristics and non-material heritage including ritual practices and royal connections. Moreover, heritage planning must include community stakeholders in creating interpretive programs, digital storytelling platforms, and public exhibitions to promote inclusive engagement.

Insights from Masjid Kapitan Keling and Kampung Laut Mosque highlight the significance of adaptive reuse and community engagement in heritage management. These examples show that heritage sites flourish not just through conservation but by becoming part of the cultural and social fabric of daily life. Utilizing these insights in the context of Masjid Zahir, this research enhances a comprehensive understanding of heritage sustainability focusing on active traditions, communal ownership, and cultural resilience.

In conclusion, the preservation of Masjid Zahir should be regarded as beyond a mere technical task of physical maintenance. It needs a multidimensional approach that includes symbolic significance, community involvement, and policy incorporation. This study lays the groundwork for subsequent

research and conservation initiatives related to royal heritage mosques, delivering theoretical understanding and practical advice for maintaining their influence on Malaysia's cultural environment.

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e ISSN 3030-5543



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SIMPORA XVI : 2025