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Resilience of Culture & Symbolism in Built Environment

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PROCEEDINGS OF THE 15TH REGIONAL SYMPOSIUM OF THE MALAY ARCHIPELAGO

SIMPORA XV: 2024

Organised by:

Centre for Knowledge and Understanding of Tropical Architectural and Interior (KUTAI)
Universiti Teknologi MARA Perak Branch
Seri Iskandar Campus, Perak, MALAYSIA

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Alamat:
Unit Penerbitan UiTM Perak,
Pejabat Jaringan Industri, Masyarakat dan Alumni (PJIMA)
Universiti Teknologi MARA, Perak Branch,
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05-3742716

uitmperakpress@gmail.com

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Universiti Teknologi MARA Perak Branch
Seri Iskandar Campus, Perak, MALAYSIA

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KEYNOTE SPEAKERS 1

PROFESOR ADJUNG DATO' (DR.) MOHAMED GHAZALI DATO' MOHAMED YUSOFF
Pengerusi Majlis Lembaga Peradaban Melayu (ADAB)

KEYNOTE SPEAKERS 2

PROFESOR DATO' DR. ABDULLAH MOHAMAD SAID
University Technologi MARA, Perak Branch, Malaysia

PREFACE



Assalamualaikum warohmatullahi wabarokatuh,

All praises are due to Allah, the Most Gracious, for His countless blessings, which have allowed us to gather for the 15th Symposium Nusantara (SIMPORA XV: 2024). Since its inception in 1997, SIMPORA has established itself as a key platform for intellectual discourse, fostering collaborations among scholars, researchers, students, and practitioners dedicated to the promotion and preservation of Nusantara culture, heritage, architecture, and traditions.

Building upon the success of SIMPORA XIV: 2023, which was held in Indonesia, this year's symposium brings us back to Malaysia, with UiTM Perak Branch and the Center for Knowledge & Understanding of Tropical Architecture & Interior (KUTAI) as the hosts. Themed *"Resilience of Culture & Symbolism in Built Environment,"* SIMPORA XV reflects the enduring importance of Nusantara identity in navigating modern challenges.

This year's program, spanning seven days from September 7th to September 13th, 2024, showcases 29 oral and poster presentations from 13 universities across Malaysia and Indonesia. With contributions from diverse academic and cultural perspectives, the symposium aims to foster meaningful exchanges on the architecture and built heritage of Nusantara.

As part of KUTAI's commitment to knowledge dissemination, the proceedings of SIMPORA XV will join an ongoing series that began with the 9th Symposium Nusantara in 2013. Following the transition to ISSN Proceedings with last year's symposium, this year's publication continues to solidify SIMPORA's legacy as a valuable academic resource for the region.

I extend my deepest gratitude to the strategic collaborators who have made this event possible, particularly Lembaga Peradaban Melayu (ADAB), Majlis Bandaraya Ipoh (MBI), D'Village Hotel & Villa, and all supporting organizations. My heartfelt appreciation also goes to the dedicated committee members, whose tireless efforts have ensured the success of this event.

It is my sincere hope that SIMPORA XV: 2024 will inspire innovative ideas, strengthen partnerships, and deepen our collective understanding of Nusantara heritage. Together, let us uphold the resilience of our culture and symbolism, ensuring they remain vibrant and relevant for generations to come.

ASSOCIATE PROFESSOR DR MOHD SABRIZAA B ABD RASHID
CHAIRMAN
15TH SIMPOSIUM NUSANTARA (SIMPORA XV: 2024)
CENTRE OF KNOWLEDGE & UNDERSTANDING OF TROPICAL ARCHITECTURE & INTERIOR (KUTAI)

FOREWARD I



Assalamualaikum Warahmatullahi Wabarakatuh & Greetings,

All praises be to Allah SWT, whose infinite blessings and grace have allowed us to gather here tonight for the "Malam Nusantara" Dinner and the official launch of SIMPORA XV: 2024. It is with immense gratitude and honor that I join this significant occasion, a testament to our shared commitment to celebrating and preserving the rich heritage of Nusantara.

I wish to extend my sincere appreciation to Universiti Teknologi MARA (UiTM) Perak Branch, particularly the Center for Knowledge & Understanding of Tropical Architecture & Interior (KUTAI), for their relentless effort in organizing this prestigious symposium. My heartfelt thanks also go to our esteemed strategic partners—Lembaga Peradaban Melayu (ADAB), Majlis Bandaraya Ipoh (MBI), D'Village Hotel & Villa, and others—whose collaboration has greatly enriched this endeavor.

This year's symposium is a remarkable effort, warmly hosted in Kuala Kangsar, Perak : a district celebrated for its rich history, vibrant cultural heritage, and royal traditions. It brings together brilliant minds to exchange ideas, share insights, and explore strategies to preserve and celebrate the architectural and cultural treasures of Nusantara.

The chosen theme, "Resilience of Culture & Symbolism in Built Environment," resonates deeply with Kuala Kangsar, a town that stands as a living testament to this very concept. Known for its royal heritage, iconic architecture, and rich traditions, Kuala Kangsar beautifully exemplifies the delicate balance between preserving cultural identity and embracing modernization. I am deeply heartened by the participation of distinguished local and international institutions, particularly our brethren from Indonesia.

In closing, I congratulate UiTM Perak Branch, KUTAI, and all involved for the successful organization of SIMPORA XV: 2024. My gratitude extends to the presenters, participants, and every individual who has contributed to this event's success. May this symposium inspire innovative architectural solutions while safeguarding the enduring cultural and symbolic resilience of our shared heritage.

With Bismillahirrahmanirrahim, I sincerely officiate SIMPORA XV: 2024 as a celebration of the enduring legacy of Nusantara
Thank you.

TOH MAHARAJA INDERA
DR KHAIRIL ANUAR BIN ARSHAD
ORANG BESAR JAJAHAN KUALA KANGSAR

FOREWARD II



Assalamualaikum warohmatullahi wabarokatuh,

Alhamdulillah, all praises to Allah SWT for His blessings that enable us to gather for SIMPORA XV: 2024. This symposium represents UiTM's commitment to advancing knowledge, fostering academic exchange, and reinforcing our shared responsibility to preserve the architectural and cultural heritage of Nusantara.

Organized annually by the Center for Knowledge & Understanding of Tropical Architecture & Interior (KUTAI), UiTM Perak Branch, this symposium is a proud testament to our commitment to celebrating and advancing the rich heritage of Nusantara architecture. We are deeply grateful for the support of our strategic partners, including Lembaga Peradaban Melayu (ADAB), Majlis Bandaraya Ipoh (MBI), Lembaga Muzium Negeri Perak, and other esteemed local and international institutions.

SIMPORA XV: 2024 serves as a dynamic platform for knowledge exchange, fostering collaboration among students, researchers, and enthusiasts dedicated to traditional architecture and cultural heritage. Over the years, KUTAI has successfully built a network that spans the Nusantara region from Aceh to Makassar and has now returned to Malaysia. These efforts align with UiTM's strategic objectives in research excellence, impactful publications, and international networking.

As part of the ICAN UiTM family, we are proud to play a role in creating meaningful connections among scholars, researchers, and practitioners, both locally and internationally. On behalf of UiTM, I extend my heartfelt appreciation to our international and local collaborators, especially universities from Malaysia and Indonesia, for their invaluable support and contributions. Special gratitude is due to ADAB, Majlis Bandaraya Ipoh, and Kampung Warisan Budaya Karai for their partnership in ensuring the success of this event.

Through the thoughtful contributions of all involved, SIMPORA XV serves as a platform for collaborative efforts to preserve, promote, and innovate upon the traditions that define our collective identity. We hope this event leaves a lasting impact, inspiring a deeper understanding of Nusantara heritage, while encouraging the adaptation of its values and principles to shape the future of our built environment.

PROFESSOR TPR. DR JAMALUNLAILI ABDULLAH
TIMBALAN NAIB CANSELOR ICAN
(INDUSTRY, COMMUNITY AND ALUMNI NETWORK)

FOREWARD III



Assalamualaikum Warahmatullahi Wabarakatuh & Greetings,

In the Name of Allah, the Most Gracious, the Most Merciful,

It is with immense gratitude that I welcome the success of SIMPORA XV: 2024, hosted by Center for Knowledge & Understanding of Tropical Architecture & Interior (KUTAI), UiTM Perak. This symposium has been an excellent example of how academic collaboration can thrive across borders and generations, creating an inspiring environment where we not only preserve but also advance the Nusantara architectural legacy.

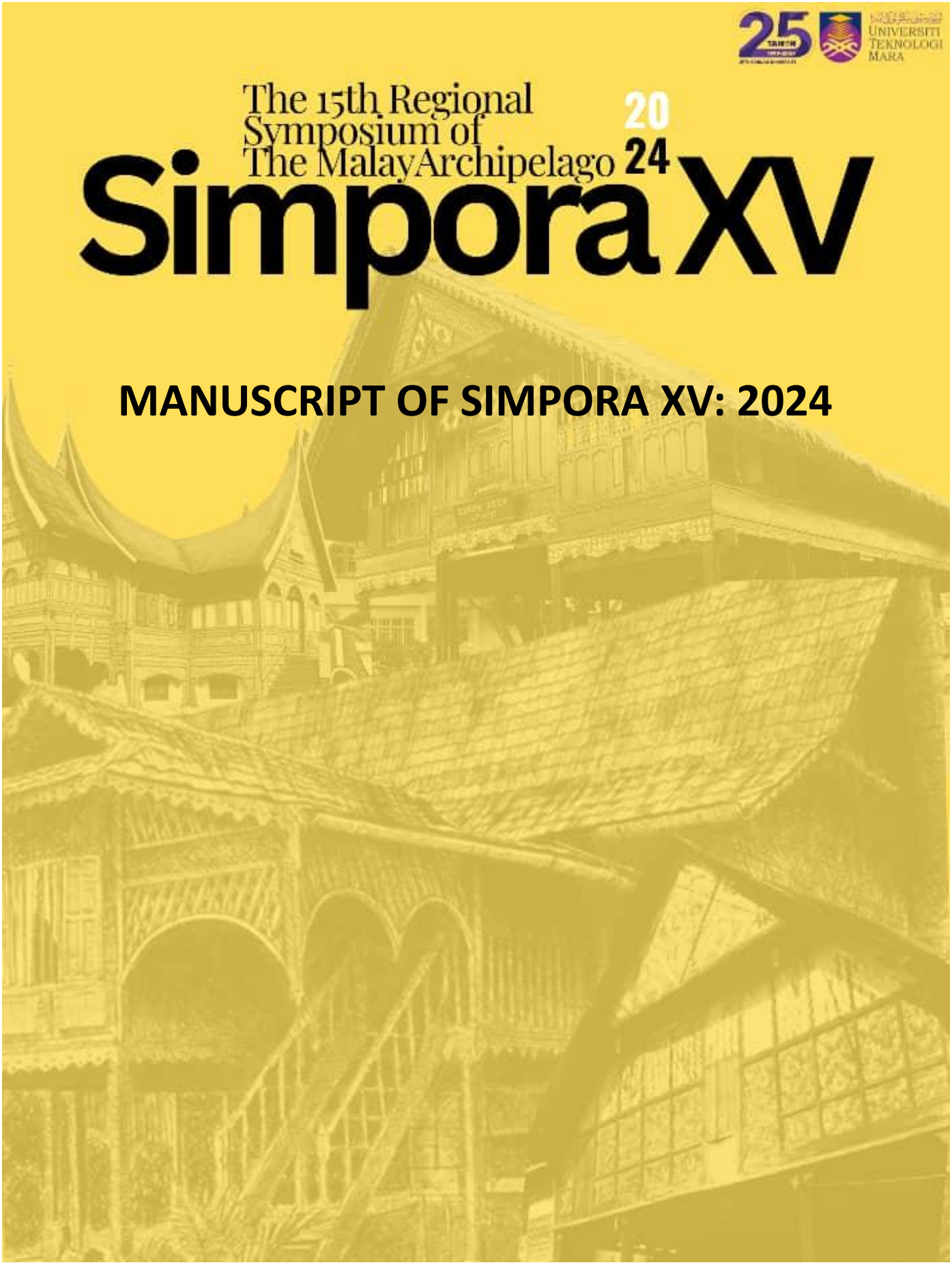
It is with deep gratitude that we gather for SIMPORA XV: 2024, a reflection of our shared commitment to preserving and advancing the architectural and cultural heritage of Nusantara. The symposium, held from 7 to 13 September 2024, was organized by UiTM Perak Branch and the Center for Knowledge & Understanding of Tropical Architecture & Interior (KUTAI), in collaboration with esteemed partners such as Lembaga Peradaban Melayu (ADAB), Majlis Bandaraya Ipoh (MBI), D'Village Hotel & Villa, and many others.

SIMPORA XV brought together students and scholars through various programs such as the International Student Workshop (INSWA), which encouraged hands-on learning and cross-cultural idea exchange on Nusantara architecture. The Conference and Dinner at Karai provided a platform for in-depth academic discussions and networking, while also celebrating the shared cultural values that unite us under the Nusantara banner. Furthermore, the East Coast Architecture Excursion (EAE) gave participants an enriching opportunity to explore Malaysia's east coast and connect firsthand with the region’s architectural heritage, deepening their understanding of how these structures reflect our cultural traditions.

I would like to express my sincere appreciation to KUTAI, all our dedicated partners, and collaborators for making SIMPORA XV a resounding success. Your contributions are integral to our ongoing efforts to promote a deeper understanding of Nusantara's rich heritage while shaping the future of architectural research and practice.

Lets make our collective efforts continue to inspire a greater appreciation of our cultural identity and its resilience in the built environment.

ASSOCIATE PROFESSOR DR NUR HISHAM IBRAHIM
RECTOR
UNIVERSITI TEKNOLOGI MARA PERAK BRANCH



MANUSCRIPT OF SIMPORA XV: 2024



UCAPTAMA 1:
NUSANTARA, ALAM RUMPUN BANGSA DAN TAMADUN

Mohamed Ghazali Mohamed Yusoff[1] & Mawar Masri[2*]
[1,2]Lembaga Peradaban Melayu (ADAB)
[2]College of Built Environment, Universiti Teknologi MARA Selangor, Puncak Alam Campus, 42300 Bandar Puncak Alam, Selangor, MALAYSIA

*Corresponding Author: mawar194@uitm.edu.my**

Abstract: This paper is the text of Guest Speaker 1 (*Ucaptama 1*) presented by Adjunct Professor Dato' Dr. Mohamed Ghazali Dato' Mohamed Yusoff, Chairman of Lembaga Peradaban Melayu (ADAB) during the 15th Regional Symposium of The Malay Archipelago on 9 September 2024 at Kampung Budaya Warisan, Karai, Perak, Malaysia. The title "NUSANTARA, ALAM RUMPUN BANGSA DAN TAMADUN" was presented from the perspective of Lembaga Peradaban Melayu (ADAB), a Non-Government Organization (NGO) in Malaysia. The ADAB perspective is intended as a guide to the younger generation to understand from the perspective of "*peradaban*" or civilizational towards cultural-tradition resilience. The focus of the paper is comprehending the *Alam Nusantara* (Nusantara realm) from three dimensions: geographical; the race residing within the realm; *tamadun* and *peradaban* developed by the indigenous race of this realm. Highlighted as well ADAB's perspective towards "*budi*" as an element of civilization resulting from the evolution of Nusantara societies' values networks (*umbaian*). The text is written in the Malay language as it was presented in Malay.

***Keywords*:** Nusantara, *Peradaban*, *Budi*, Maritime Civilization

PENGENALAN

Lingkungan binaan manusia (*built environment*) adalah hasil buatan pemikiran manusia, yang asing daripada *environment* yang semula jadi, di mana manusia itu membina satu alamnya sendiri. Penghasilan *built environment* suatu yang menunjukkan kemajuan kelompok-kelompok bangsa, mengikut aliran cara hidup mereka, yang menonjolkan satu identiti atau jati diri masyarakat.

Semua kelompok bangsa mempunyai alam semula jadi mereka.

Mengenali alam semula jadi itu sama pentingnya dengan mengamati *built environment* di alam berkenaan.

Di sini saya akan cuba menghuraikan alam Nusantara, yakni alam kita di mana kita membincangkan linkungan binaan manusia (*built environment*) dalam siri SIMPORA ini.

ALAM NUSANTARA

Nusantara, alam kita, adalah satu alam semula jadi.

Nusantara, juga dikenali dengan beberapa istilah lain. Ia dikenali sebagai the *Malay World* dalam terminologi antarabangsa, dan juga di beberapa bahagian alam ini sendiri, seperti di Filipina, di Malaysia dan di Brunei.

Alam Nusantara ini harus dikenali daripada tiga dimensi (sebagaimana juga alam-alam lain di dunia). Dimensi pertama, ialah alam geografi. Ini adalah alam semula jadi. Dimensi kedua ialah penghunian akan alam ini oleh satu kelompok bangsa. Dimensi ketiga ialah hakikat tamadun dan peradaban yang muncul di alam ini hasil evolusi masyarakat bangsanya merentasi ribuan tahun.

1.1 Dimensi Pertama

Dimensi pertama alam Nusantara ialah alam geografinya. Alam Nusantara wujud dengan amat nyatanya seperti yang telah dihuraikan oleh Sukarno, presiden negara Indonesia yang pertama dalam salah satu pidatonya di awal sejarah pembinaan negara Indonesia moden, dalam mengukirkan negara Indonesia. Ditekankanya Indonesia satu alam gugusan pulau-pulau yang di tenggara Benua Asia, jelas dan nyata berbeza dan terasing daripada daratan Benua Asia. Deskripsi ini menekankan akan satu alam kepulauan, dan satu alam yang asing dan berbeza.

Cuma, Nusantara sebagai satu alam geografi semula jadi itu lebih luas daripada apa yang disebut oleh Sukarno. Kerana, ia juga meliputi sebahagian daripada tanah besar benua Asia, iaitu Semenanjung Tanah Melayu, dan beberapa wilayah di Kemboja, Vietnam, dan di selatan Myanmar, malah dalam sejarah yang lebih panjang juga termasuk Pulau Taiwan dan Pulau Hainan.

Alam geografi Nusantara adalah satu alam yang amat tua. Ia juga satu alam yang telah melalui transformasi yang amat ketara. Sebagai satu wilayah permukiman manusia moden yang amat awal, yang kini kita sebut sebagai Nusantara, ia mulanya sebuah benua kecil (subcontinent) yang luas, dinamakan oleh pakar pengkaji Eropah sebagai Sundaland (‘Bumi Sunda’).

Benua kecil ini terpecah menjadi pulau-pulau yang ada sekarang ini bermula 20,000 tahun dahulu akibat mula naiknya paras laut sehingga setinggi 120 meter akhirnya 13,000 tahun kemudian.

Kepulauan Nusantara terbentuk, dengan ribuan pulau-pulau baru, besar dan kecil, dan dengan tersebarnya bangsa Nusantara seterusnya, menyatu dengan pulau-pulau lain yang

telah sedia ada, seperti pulau-pulau Filipina sekarang ini dan pulau-pulau yang sekarang adalah pulau-pulau timur Indonesia. Menjadi kepulau terbesar di dunia.

1.2 Dimensi Kedua

Dimensi kedua alam Nusantara ialah dimensi bangsa yang penghuni alam ini. Telah wujud menghuni akan alam Nusantara ini sebagai manusia pribuminya semenjak ribuan tahun, satu bangsa yang serumpun, yang besar.

Rumpun bangsa ini dinamakan oleh pakar pengkaji antarabangsa sebagai keluarga bangsa Malayo-Polynesians, dan Austronesians. Mereka menghuni sebagai orang pribumi di seluruh alam geografi Nusantara sehingga kini. Maka ia disebut amnya sebagai serumpun atau bangsa serumpun dalam bahasa kita. Istilah dalam bahasa Inggerisnya ialah the Malay race.

Bangsa serumpun itu bermaksud yang leluhur sama, dari satu nenek moyang, dan rumpun bangsa ini terbentuk bersuku-suku di alam ini, bertutur bahasa-bahasa daripada satu keluarga bahasa yang sama.

1.3 Dimensi Ketiga

Dimensi ketiga alam Nusantara ialah dimensi tamadun dan peradaban yang terbangun oleh bangsa pribuminya di alam ini.

Dalam terminologi sarjana-sarjana antarabangsa, tamadun dan peradaban ini disebut sebagai civilisation dengan definisi yang tertentu.

Kami di Lembaga Peradaban Melayu (ADAB), meletakkan bahawa apa yang disebut *internationally* sebagai *civilisation* itu, terdiri daripada dua elemen iaitu elemen tamadun dan elemen peradaban.

(a) Elemen Tamadun

Elemen tamadun kami maksudkan sebagai cara hidup. Maka nyata ada tamadun padang pasir (seperti di Asia Barat), dan tamadun tanah tinggi (seperti di Tibet dan Banjaran Andes di Benua Amerika Selatan, dan tamadun Artik iaitu tamadun khutub). Nyata sekali ada perbezaan cara hidup antara jenis-jenis tamadun ini sebagai contoh, akibat alam semula jadi geografi yang amat berbeza.

Di alam Nusantara, apa yang muncul adalah satu tamadun yang lain sama sekali.

Nusantara ialah suatu tamadun maritim, atau tamadun kelautan.

Bangsa serumpun di alam Nusantara, daripada nenek moyang kita, telah membangunkan satu cara hidup yang amat berbeza umumnya dengan cara hidup di bahagian-bahagian lain Benua Asia. Munculnya cara hidup maritim, yang berbeza di alam Nusantara berlaku akibat sejarah geografi alam kita seperti yang telah disebut sebentar tadi, begitu berbeza daripada alam geografi Benua Asia yang selainnya.

Bukan sahaja tamadun bangsa serumpun ini tamadun yang berbeza di Benua Asia, malah amat tepat jika dinyatakan bangsa serumpun kita adalah tamadun maritim yang tunggal dalam sejarah manusia.

Tiada sebarang tamadun maritim yang setulennya satu tamadun maritim seperti tamadun bangsa kita di alam Nusantara. Dan, tamadun maritim Nusantara adalah ibu kepada satu alam tamadun maritim yang maha luas, menembang ke pulau-pulau seluruh Lautan Pasifik, dan juga merentasi Lautan Hindi di sebelah barat alam kepulaun kita.

(b) Elemen Peradaban

Peradaban pula kami nyatakan di Lembaga Peradaban Melayu, adalah nilai-nilai masyarakat, sebahagian daripada malah inti kepada civilisation; yang membangun selari dengan cara hidup tamadun yang terhasil.

Peradaban alam Nusantara yang saya kemukakan di sini berdasarkan pengetahuan, kajian dan penelitian akannya di Semenanjung Tanah Melayu.

Sebagai elemen peradaban, budi adalah satu istilah yang lazim didengar di alam Nusantara. Nusantara adalah satu alam budi. Dalam istilah Lembaga Peradaban Melayu ia adalah satu umbaian nilai-nilai masyarakat hasil evolusi keperkertian dan tata susila yang terbangun dalam kalangan bangsa serumpun kita dari awal membangunnya tamadun kita di alam Nusantara ini.

Benih umbaian nilai-nilai masyarakat ini adalah di dalam akal dan hati secara kombinasi atau gabungan. Yakni, gabungan yang segerak (*synchronised*) antara pertimbangan akal (pemikiran yang benar dan tulus), dan perkiraan hati (keindahan, kemurnian, kehalusan, kesucian, keperikemanusiaan - atau *virtues*).

ALAM BUDI

Alam budi sering disebut berisi budi pekerti (tingkah laku yang baik), budi bahasa (perilaku pertuturan yang baik), dan budi bicara (pertimbangan yang baik, adil, dan berperikemanusiaan). Boleh juga ditambah budi bakti (gerak hati menyumbang jasa kepada orang dan masyarakat), seperti yang didendangkan dalam lagu popular di Malaysia, Joget Pahang (dengan satu ciptaan lirik yang sarat berisi sebutan budi). *[LIRIK : ... "Negeri Pahang aman sentosa, Kaya dengan tumbuh-tumbuhan; Niat di hati nak buatlah jasa, Mudah-mudahan Tuhan kabulkan.]*

Budi, umbaian nilai-nilai yang dipegang kuat masyarakat tradisional Melayu di Semenanjung bertujuan membina masyarakat yang terbaik dan sentosa.

Budi adalah satu kebijaksaan, juga satu keindahan. Diceritakan satu kisah pada tahun-tahun awal Malaysia terbentuk, askat-askar dari Semenanjung ditempatkan di Sabah untuk tugas keselamatan. Orang pribumi tempatan (daripada suku serumpun juga) tidak suka bersua dengan askar-askar tersebut kerana tidak mengenali; namun mereka membuat kuih-kuih dan diletakkan di tempat di mana askar-askar tersebut boleh mengambilnya untuk mereka makan. Askar-askar dari Semenanjung menyedari itu budi bahasa mereka.

Balik semula ke lirik Joget Pahang : *"Pukullah gendang hai kulit kerbau, Dalam majlis tari menari; Sayalah ini dagang merantau, Mengharapkan belas orang di sini"*.

Kebijaksaan itu mempunyai kawalannya. Alam budi ini tidak seharusnya membawa kepada tergelincir ke arah memburukkan diri sendiri. Dalam berbudi, seorang itu harus mengenali had dan sempadan. Maka, ditulis oleh seorang bukan Melayu (Dr. Lim Kim Hui) yang mengkaji budi Melayu sebagai 'minda Melayu' di Malaysia, dalam berbudi sebagai contoh merendah diri, janganlah ia sampai menghina diri sendiri (Lim, 2003).

Hakikatnya ialah di alam budi itu sebagai peradaban ada bahagian pertimbangan patut; apa yang patut, dan apa yang tidak patut. Moral alam budi ialah mengenali titik patut dan berpaut pada yang patut.

Hasil daripada amalan umbaian nilai-nilai budi ini ialah satu masyarakat orang-orang yang disebut sebagai budiman. Satu bangsa yang penuh berperadaban - *a people of genuine culture*. Budi juga mendasari bagi bangsa serumpun mengenai pergaulan antara bangsa-bangsa, dan suku-suku, dan dengan kaum-kaum lain.

Seperkara yang menonjol dan dikenali oleh Dr. Lim Kim Hui ialah alam budi itu adalah suatu alam yang tidak memiliki sifat *dialectical*. Sikap *dialectical* adalah sikap yang tajam dengan perdebatan. Debat bukan pilihan alam budi. Masyarakat tradisional budaya di Semenanjung mengelak pemikiran debat *('dialectical argumentation'*) (Lim, 2003).

Dengan itu alam budi Nusantara berbeza dengan budaya Barat (yang dikenali sebagai budaya *rationality*), dan juga beberapa budaya asing di Benua Asia ('*budaya superiority'*) di mana sifat yang nyata adalah pertentangan dan perseteruan ('*oppositional'* dan '*confrontational*'), persaingan ('*competitive*'), menekan ('*forceful'*), menggasak (*'aggressive'*), dan bermusuhan (*'hostile'*) (Lim, 2003).

Menang *('winning'*) (perdebatan, atau perundingan) menjadi tujuan dalam budaya Barat dan beberapa budaya *superiority* di Asia. Manakala, dalam alam budi Nusantara, moralnya mencari di mana titik patut dalam semua hal, bukannya kemenangan; maka, semua mendapat hak yang patut, tanpa sesiapa yang menjadi terus kalah.

Tolak ansur, bertimbang rasa serta mengenali hak kepatutan semua pihak termasuk diri sendiri menjadi pertimbangan yang diingini, bukan menonjolkan ketajaman pemikiran intelek, atau menyelitkan muslihat bagaimana untuk mendapat atau mencuri kelebihan atau kemenangan dalam apa-apa situasi.

Apa yang patut adalah kehendak alam budi. Kehendak patut ini menghalang sikap ekstremisme (sikap melampau) muncul dalam masyarakat.

Seorang Inggeris, pengkaji peribahasa (*proverbs*) Melayu di Semenanjung Tanah Melayu, tahun 1891 bernama Hugh Clifford, kagum dengan amalan dalam masyarakat tradisional Melayu di Semenanjung memetik peribahasa dan perbilangan dalam perbincangan atau pertemuan. Clifford merumuskan orang yang paling dipandang tinggi dan dihargai dalam masyarakat tradisional Melayu adalah yang pandai mengemukakan peribahasa dan perbilangan, yang tepat; bukan orang yang menampilkan cerdik pandai intelek rasional (Lim, 2003).

Maka ditulis oleh Lim Kim Hui bahawa "orang Melayu mempunyai sebab kenapa mereka mengenepikan kecerdikan menaakul intelek (membuat pertimbangan dengan logik)". Pertimbangan logik akan mengakibatkan perdebatan dan konfrontasi, dan penonjolan kemegahan kuasa intelek seseorang (meninggi diri - bertentangan dengan kehendak sifat budi). Manakala, peribahasa dan perbilangan yang disajikan "membawa semua merasakan persetujuan, dengan menarik mereka kepada satu ingatan budaya bangsa, dan sifat budi nenek moyang", yakni menumpulah kepada kebijaksanaan masyarakat, bukan kepintaran intelek seseorang individu (Lim, 2003).

RUMUSAN

Sebagai rumusan ucapan saya, saya telah menegaskan tiga dimensi alam Nusantara. Mahkota kepada alam ini ialah peradaban bangsa serumpun kita.

Dalam apa-apa bidang sekali pun di mana kita berkecimpung saya merasakan maka seharusnyalah kita mengenali dengan baik akan lingkungan alam, tamadun dan peradaban serumpun kita. Dan, berhimpun dengan keluarga yang penuh sedapat mungkin di mana bersama-sama kita melestarikan alam rumpun bangsa kita, dan tamadun dan peradaban kita yang tersendiri. Diperkukuhkan dan diperkayakan lagi. Dirapatkan.

Apakah mungkin persidangan-persidangan kita, apa bidang sekali pun, dapat mengumpulkan kesemua suku-suku bangsa kita, termasuk dari Filipina, Taiwan, Vietnam, Kemboja, Thailand. Ini di Asia Tenggara. Harus sampai masanya satu hari nanti usaha kita sampai menghimpunkan suku-suku bangsa kita di Lautan Pasifik dan di Pulau Madagascar juga.

Dan, saya yakin kita harus mengenali tanah-tanah alam serumpun kita sebagai unit tamadun, dan bukan sebagai unit politik. Maksudnya, jika dalam bidang arsitektur, kita merujuk kepada pelbagai manifestasi arsiteksur dengan mengidentifikasi pulau-pulau sebagai tanah habitasi suku-suku bangsa kita, seperti Pulau Jawa, Pulau Sulawesi, Pulau Langkawi, Pulau Luzon, Dan lain-lain. (bukannya sebagai Indonesia atau Malaysia, atau Filipina, dan sebagainya kerana yang ini semua adalah istilah-istilah politik).

Cara pemikiran orang-orang Nusantara, terutamanya Sistem Nilai (*Value System*) Nusantara harus ***goes beyond*** Asia Tenggara (*South-East Asia*). Mengantarabangsakan Malay Civilization melalui cara pergaulan kita dengan orang lain, paling penting adalah pendidikan (education). Kita harus membawa kembali semua kekayaan (*all the wealth*) dalam pemikiran (*mind*) dan kebijaksaan (*intelligence*) ini. Amat penting adalah Sistem Nilai ini tertanam di dalam sanubari (*in your heart*).

Terima kasih.

*Profesor Adjung Dato' (Dr.) Mohamed Ghazali Dato' Mohamed Yusoff ialah Pengerusi Majlis, Lembaga Peradaban Melayu (ADAB), sebuah NGO di Malaysia.

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REFERENCES

Lim, Kim Hui (2003). *Budi as The Malay Mind: A Philosophical Study of Malay Ways of Reasoning and Emotion in Peribahasa*. [Unpublished doctoral dissertation] Asia-Africa Institute Faculty of Oriental Studies in candidacy for PhD. Department of Austronesian Studies. University of Hamburg.

Lembaga Peradaban Melayu (n.d.). Pengenalan, https://www.lembagaperadabanmelayu.org/

Mohd Yusof Hitam (2020). Pengenalan, *Citra ADAB: Umbaian Tekad Peradaban Melayu* (pp. v-ix). Lembaga Peradaban Melayu (ADAB).



THE ISLAMIC SPECTRUM OF MALAY TRADITIONAL ARCHITECTURE: CASE STUDY OF TOK ABU BAKAR ALANG KETAK HOUSE

Mohd Sabrizaa Abd Rashid[1*], Iryani Abdul Halim Choo[2]
[1,2]Affiliation: Department of Built Environment Studies and Technology, College of Built Environment, Universiti Teknologi MARA, Perak Branch, 32610, Seri Iskandar, Perak, MALAYSIA

Corresponding Author: iryan542@uitm.edu.my

Abstract: The Malay traditional architecture philosophy is derived from at least three main domains; Islamic religion, Malay culture practice and beliefs comprise of the do's and the don'ts in *Adat, Petua and Pantang Larang* and lastly the understanding and adaptation of environmental factors. This paper objective is to highlights the parallelism between the teaching and practice of Islam, by discussing the concept and idea of the architectural design found in the Malay traditional architecture. The house of Tok Abu Bakar Alang Ketak as one of the best samples of Perak Malay Traditional house was selected as a case study. Site observation, spatial organizations analysis and cultural study were carried out to achieve the research objectives. Four scenarios of Islamic spectrum, were found to express the situations of parallelism between the practice of Islam, the Malay culture and the spatial organization of the Malay traditional architecture.

Keywords**:** *Islamic spectrum, Rumah Limas Bumbung Perak, Malay philosophy, architecture*

INTRODUCTION

Architecture is the manifestation of culture and religion. Throughout history faith has been one of the most dominant components of cultural life. (0zkan, 2018). Furthermore, faith is one of the major components in the shaping of the built environment. In Islam, a house is not only meant for shelter. Surah An-Nahl 80 – "*It is Allah Who made your habitations homes of rest and quiet for you.".* In Surah An-Nahl 80, Allah mentions His great blessings for His servants, granting them homes to dwell in and protect themselves, where they find a variety

of benefits. A spacious house is part of the Muslim's happiness, as it says in the hadeeth narrated by Ahmad (15409) from Naafi' ibn 'Abd al-Haarith (may Allah be pleased with him) who said: The Messenger of Allah (peace and blessings of Allah be upon him) said: "Part of a man's happiness includes a good neighbor, a comfortable mount, and a spacious abode." Classed as saheeh by al-Albaani in Saheeh al-Jaami', no. 3029. Islam taught us the correct way to live the lives as it is a complete code of life. Allah Almighty says in the Holy Quran in these words: **"**Serve Allah, and join not any partners with Him; and do good – to parents, kinsfolk, orphans, those in need, neighbors who are near, neighbors who are strangers, the Companion by your side, the wayfarer [you meet], and what your right hands possess: For Allah loveth not the arrogant, the vainglorious" (Quran 4:36). In Islam, prophet Muhammad (peace be upon him) taught that "neighbor" is not just the one next door but includes all those up to forty houses in all directions which is definitely a whole neighborhood. There are many hadeeth by prophet Muhammad (peace be upon him) about the importance and the role of neighborhoods and neighbors (Muslim (77), Bukhari (6015), Al-Tirmidzi (1944). It is so important that prophet Muhammad PBUH said Jibril kept on recommending that I treat my neighbors well until I thought that he would order me to treat them as my heirs." (reported by Ibn Umar, Hadis 104).

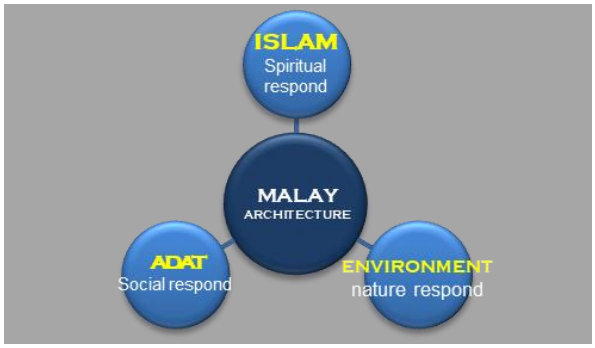


Figure 1: The philosophy of Malay architecture. *Source: Author*

Islam is a religion that emphasizes the importance of human interaction (muamalah) and even laid down rules for basic guidance. It mainly centralizes on the aspects of one's relation with Allah (ḥabl min Allāh) and with fellow humans (ḥabl min al-nās). Habluminallah Habluminannas is maintaining a relationship with God and fellow human beings. It is crucial to maintain balance and harmony between these two aspects. The relationship with God is maintained if those who are always pious and have faith, do what is good and bad. Whereas relationships with people are those who take care of their neighbors, cooperate and help each other in a community. While the human-to-God relationship denotes personal obligations to God, including devotion to the divine commands, submission of worshipping acts to Him and commitment to His prescriptions, human-to-human relationship represents social which a person contributes to the fulfillment of the rights and needs of others and assisting one another to coexist in harmony. (Nor 'Azzah Kamri et. al., 2015).

In the Malay community, *Adat(customs), Petua (tips, do and don'ts), Pantang Larang (taboos)* mean rules or guidelines that have been practiced for generations in a society through social interactions and have become a tradition in the life of that society. *Adat merisik, adat bertunang, adat perkahwinan, adat meminang, adat bercukur, adat melengggang perut, adat berkunjung* etcertra. are some of the popular *adat* still being practiced by the Malay. Both the traditions and the religions discussed above carried vast influence to the thought and lifestyle of Malay society and in the shaping of the Malay worldview and Malay architectural design concept and philosophy.

CASE STUDY: TOK ABU BAKAR ALANG KETAK HOUSE

Geographically, this house is located on the bank of Sungai Perak at position 4°20'47.6"N 100°52'35.6"E 4.346545, 100.876559 in Bota Kiri, Mukim Bota, Perak Tengah District, Perak Darul Ridzuan. Rumah Tok Abu Bakar Alang Ketak or TABAK was built in the 1920s (see Figure 2). The architectural design known as Rumah Limas Bumbung Perak (RLBP) served as the foundation for its construction. Similar to other traditional houses, the spatial organization is built with several main basic rooms or spaces such as the *serambi* (foyer), *anjung* (the porch room), rumah ibu (the mother's house/main house), *bilik tidur* (bedroom), *rumah selang* (the middle house) and dapur (the kitchen house).



Figure 2: Tok Abu Bakar Alang Ketak House. *Source: KUTAI*

Figure 3 (TABAK Side Elevation) and Figure 4 (TABAK Side Plan) present six space namely, *Anjung, Serambi, Rumah Ibu, Bilik Tidur, Rumah Selang and Dapur. Anjung* is the main space located in front of the house which is suitable as it hosts many important formal events. It is here that the host entertain guests for formal meetings such *merisik*, solemnization ceremony, wedding reception, *tahlil* or any religious activity. For wealthy families, *Rumah Anjung* is adorned with decorated windows sill and ventilation holes. For less-familiar guests, this area is also the last boundary before they can enter *Rumah Ibu.*

Rumah Ibu is a private area reserved for the house owner where only family members and close relatives are given access. Personal and family-related activities such as congregational, casual conversation, lying around and relaxation, Qur'an recitation are also done in this area. At night, this area transforms into a sleeping space for the residents. The sleeping area is commonly found at *Rumah Ibu* and it is reserved only for young ladies. It is also an area that

is deeper inside the house and the highest of importance in the hierarchy of space which is indicative of the Malay's protective nature of their young female members of the family.

Rumah Selang has a second staircase which is usually used by the females. During a feast or any celebration, female guests would enter the house through the second staircase which is placed close to *Rumah Dapur*. Female guests are normally entertained by the host's wife in this space. Many female guests assist the hosts in *Rumah Dapur* which is close to *Rumah Selang*. In addition, the kitchen annex which is located at the back of the house has the third staircase. It is a space for cooking, preparing food, and cleaning the dishes. For holder houses, the washroom was built outside the house. Modern construction however, introduces indoor washroom, which is usually placed in the kitchen area. Below the house, a bunk bed *(pangkin)* is built so that family members can relax in the afternoon or it can be utilized as a store room.

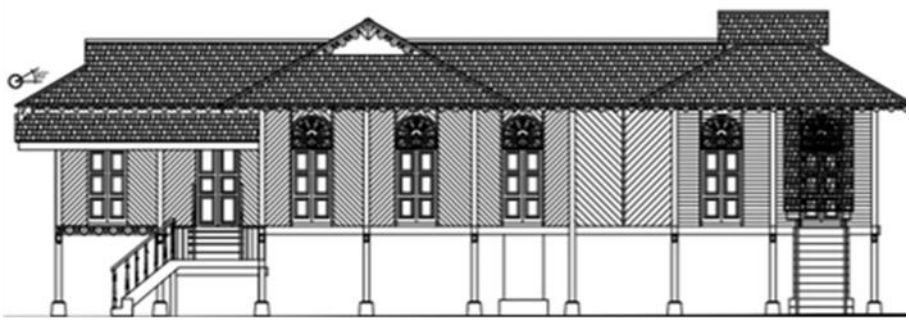


Figure 3: TABAK Side Elevation. *Source: KUTAI*

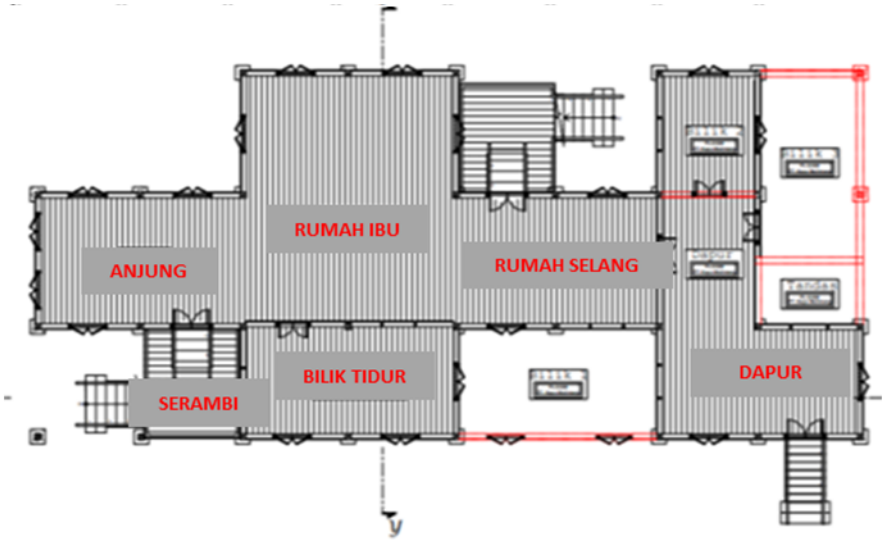


Figure 4: TABAK Floor Plan. *Source: KUTAI*

ANALYSIS & DISCUSSION

3.1 Islamic Spectra 1: Indirect View Of Main Entrance

The Malay community is very concerned about politeness and decency in visiting neighbors. In Malay culture respecting guests has a noble value in the practice of hospitality. Similarly, the practice of Islam the prophet (peace be upon him said "Whoever believes in Allah and the

Last Day, let him honor his guests." (HR. Bukhari and Muslim) [HR. Bukhari, no. 6018, 6019, 6136, 6475 and Muslim, no. 47]. In Islam the *adab* or etiquette of entering a house as a guest was mentioned in a hadeeth. While waiting for permission, do not stand in front of the door. Instead, stand to the right or to the left. The Messenger of Allah (صلى الله عليه وسلم), upon coming to someone's door, avoided facing directly. Instead, he would stand to the right or to the left of the door.

The main entrance and the secondary entrance of TABAK house is designed without direct view to the interior of the house (see Figure 5 and Figure 6). This design aligns with the Islamic custom of refraining from entering or visiting other houses. Both entrances of TABAK house prevent the visitor or guest from directly viewing into the house interior. This scenario protects the privacy of the womenfolk and other family members.

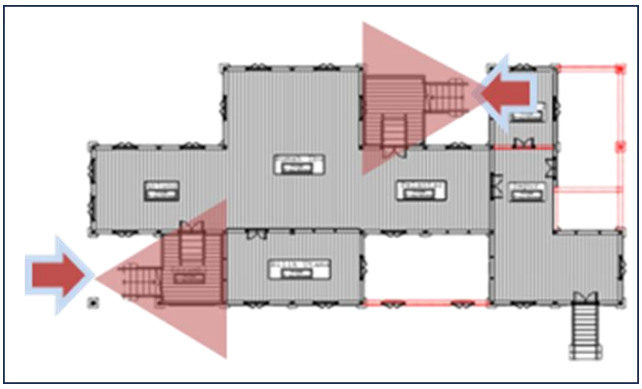


Figure 5: An indirect view of main entrance. *Source: KUTAI*

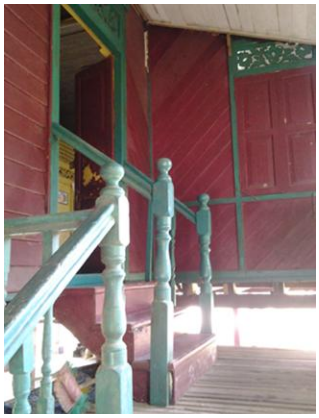


Figure 6: TABAK Main Entrance. *Source: KUTAI*

3.2 Islamic Spectra 2: Entrance By Gender

The Quran contains a balance or equality between men and women. Thus, both men and women have the same rights, especially in the public domain. When it comes to gendered spaces, Muslims have linked the concepts of modesty and piety differently for men and women in ways that restrict spaces occupied by women (Akbar, Ahmed et. al., 2024). Most RLBP architectural designs provided double entrances. The practice of gender separation for the guest or visitor is a part of tradition in the Malay culture. The main entrance located at the front of the house is meant for the man whilst the secondary entrance located at the

Rumah Selang is for the women (see Figure 7). This is closely related to the practice of the *Adab Kesantunan* or literally means "Polite Manners" in Malay culture. Through this practice; man and woman, old and young, husband and wife, father and son have its own status and sense of respectfulness to each other. *Adab kesantunan* also can be seen in conversation, politeness and manners in behavior and body gestures.

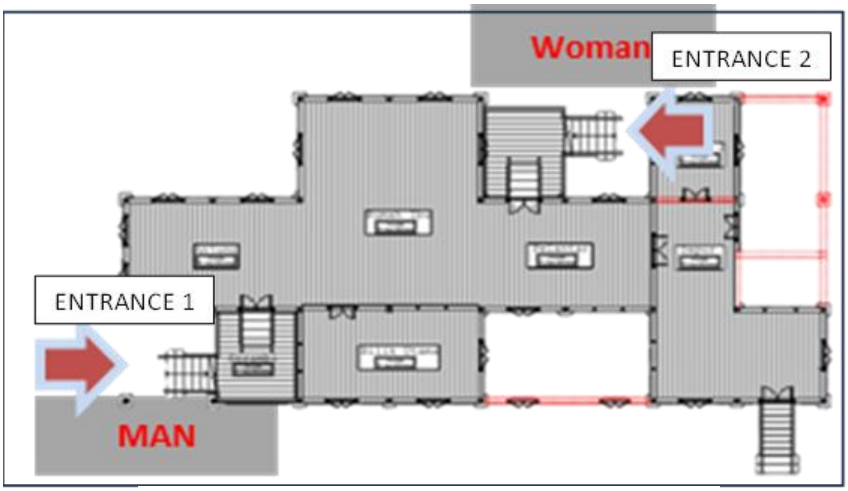


Figure 7: Entrance by gender. *Source: KUTAI*

In the Quran contains a balance or equality between men and women. Thus, both men and women have the same rights, especially in the public domain. When comes to gendered spaces, Muslims have linked the concepts of modesty and piety differently for men and women in ways that restrict spaces occupied by women (Akbar, Ahmed et. al. , 2024). Most RLBP architectural design provided double entrances. The practice of gender separation for the guest or visitor is a part of tradition in the Malay culture.

3.3 Islamic Spectra 3: Hospitality And Manners Of Receiving Guests

Manners of receiving guests in Islam are values in religion that need to be practiced as receiving guests is a form of hospitality recommended in Islam. Rasulullah SAW said, *"Whoever believes in Allah and the Last Day, let him glorify his guests."* (Narrated by Bukhari and Muslim). With regards to this matter, there is a scenario that always becomes a question to the Muslim. How a Muslim woman be hospitable to her guests in her in-law's home where all her relatives are non-Mahram? In Islamic law *non-mahram* means, it is not *Haram* (forbidden) to marry, with a few exceptions. In the scenario of receiving *non-mahram* guest in most modern residential designs, particularly in flats, apartments and landed houses, there is no space provided that is permissible to receive non-mahram guest. The Prophet Muhammad PBUH emphasized the importance of modesty. It is not permissible for a non-mahram man to enter a house without permission. Rather, the Qur'an tells us that a guest must ensure the people of the house are well-aware of their arrival by making themselves known prior to entering. The Malay house addresses this issue by creating a space known as Serambi (see

Figure 8). *Serambi* is a semi-open space located near the main staircase connecting the ground level with the main entrance door to *Anjung*. It is an open space covered partly by a 90 cm height *Pagar Musang* or balustrade. In the case of *non- mahram* guest or visitor, the space accommodates the situation well without creating *fitnah* or misunderstanding amongst neighbors.

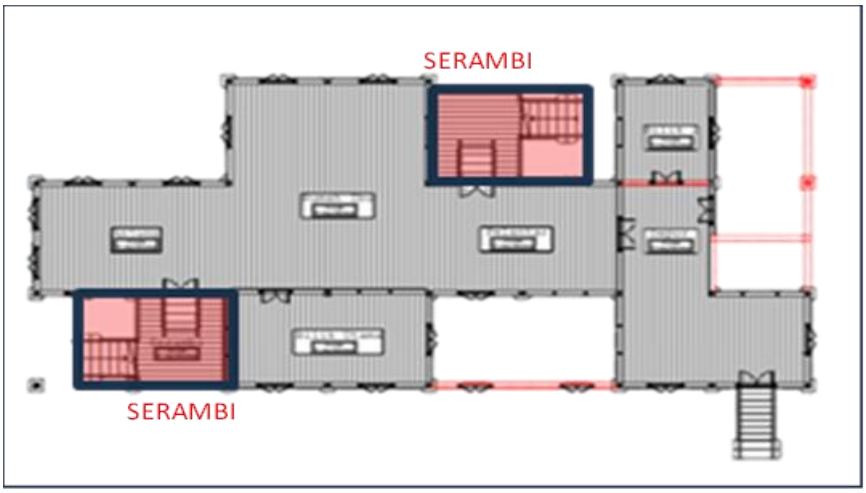


Figure 8: Hospitality and manners of receiving guests.

3.4 Islamic Spectra 4: Zoning Area For Hijab And Privacy

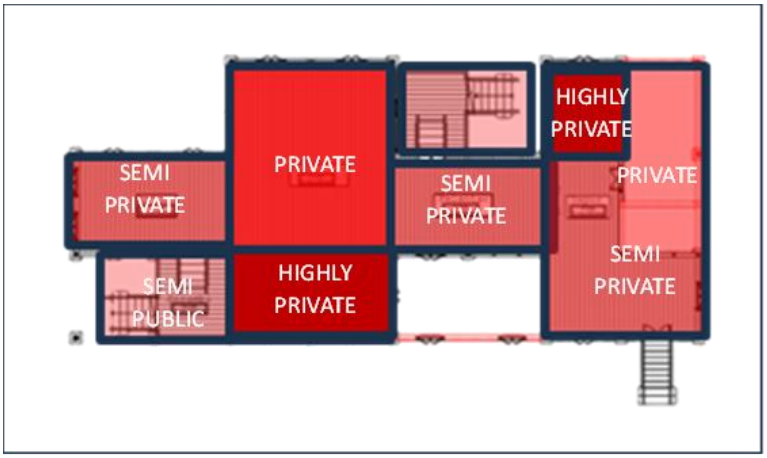


Figure 9: Zoning and Hierarchy for Hijab and privacy. *Source: KUTAI*

he spatial organization of Malay traditional architecture is designed parallel to the concept of privacy and *hijab* in Islam. The space is divided through the hierarchy of space between the public (the staircase and the door), semi-public (*serambi*) and private area (the main house) and highly private zone (bedroom) (see Figure 9).

CONCLUSION

The concept of *Ziarah* or visiting is very strong and important in Malay culture. Paying visits to our neighbors, friends or relatives is a part of tradition in the Malay community. Islam is a way of life. It is perfect when there are two main interactions: namely *hablun minallah* (human interaction with Allah) and *hablun minannas* (human interaction with human beings and the environment). Both the elements become the foundation of the Islamic code of ethics (akhlāq) and the moral guideline for compliance (Abod, 1991; Mustafar and Borhan, 2013). The four scenarios discussed in this paper represent an ordinary circumstance from the Malay lifestyles through their tradition and cultural practice. The Islamic spectrum highlighted the parallelism between the concept of dwelling in Islam and the Malay traditional architecture design. The Tok Abu Bakar Alang Ketak house represents a large part of social lifestyle formulated by the Malay culture and complemented with the practice of Islam. This research will strengthen the theoretical aspects of Malay traditional architecture.

REFERENCES

Akbar, Ahmed., Alnaim, Ali, Falahat, Sutton, *Gendered spaces in islamic cities: Bridging sharia law and urban planning goals,* Vol 1, no. 1 Journal of SYARIAT: Akhwal Syaksiyah, Jinayah, Siyasah and Muamalah, Vol. 1, no.1, p.18-35, 2024

Mohd Sabrizaa Abd Rashid (2017), Rumah Kutai – Documentation of Memories, Institut Darul Ridzuan : Ipoh.

Muhammad Suhaimi bin Musa et.al*., Islamic design guidelines: an analysis of the aspect of hijab in the main entrance design of Kutai Malay house,* 2ndInternational Conference on Innovation Technology for Sustainable Built Environment 2014

Nor ʻAzzah Kamri & Siti Fairuz Ramlan., *The Application Of Ḥabl Min Allāh And Ḥabl Min Al-Nās Elements in Islamic Code of Ethics: An Exploratory Case Study*, International Journal of Economics, Management and Accounting 23, no. 1 (2015): 57-78

Siddiq Fadzil (2012), *Islam dan Melayu*, Akademi Kajian Ketamadunan : Kajang

Suha 0zkan, *Faith, Culture and Architecture,* Arch. &Comport. 1 Arch. & Behav., Vol. 11, no 3-4, p. 181 – 186, 2018

Tita Cardiah., Rangga Firmansyah., Hendi Anwar & Titihan Sarihati, *The "Habluminannas and Habluminallah" Concept in the Al Adho Mosque Design*, November 2021 Design Engineering 2021(8):12420 - 12430

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ADAPTIVE REUSE OF TRADITIONAL MALAY HOUSE: CASE STUDY OF TOK ABU BAKAR ALANG KETAK (TABAK)

Kartina Alauddin[1*], Mohd Nurfaisal Baharuddin[2]

[1,2]Department of Built Environment Studies and Technology, College of Built Environment, Universiti Teknologi MARA, Perak Branch, 32610, Seri Iskandar, Perak, MALAYSIA

**Corresponding Author: karti540@uitm.edu.my*

Abstract: Adaptive reuse is a sustainable conservation strategy that preserves the cultural and historical significance of traditional buildings while accommodating contemporary functions. This study focuses on the adaptive reuse of the Tok Abu Bakar Alang Ketak (TABAK) house, a traditional Malay dwelling located in Bota, Perak, Malaysia. The TABAK house, an important example of Malay vernacular architecture, reflects cultural values, environmental responsibility, and heritage conservation. However, like many heritage structures, it faces challenges of obsolescence and potential neglect due to changing social and economic conditions. To address these challenges, it is essential to explore the issues of adapting traditional Malay houses for modern functions. Through single case study, this research investigates how adaptive reuse can breathe new life into the TABAK house while maintaining its architectural integrity and historical significance. The study examines the successful of house's transformation from a residence into a multifunctional space, including a gallery, research center, community hub, academic facility, and venue for cultural competitions. The findings demonstrate that, when executed with sensitivity, adaptive reuse can effectively preserve the core elements of traditional Malay architecture while integrating modern uses that ensure the building's continued relevance and sustainability. This research contributes to the growing body of knowledge on sustainable heritage conservation and provides valuable insights for future efforts in adapting traditional Malay houses to meet contemporary functions and needs.

***Keywords*:** Adaptive Reuse, Traditional Malay Houses, Modern Functions, Case Study, TABAK

INTRODUCTION

The preservation of cultural heritage has gained significant attention in architectural conservation practices, particularly in the face of rapid urbanization and modernization.

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Traditional buildings are often at risk of obsolescence or demolition due to evolving social, economic, and technological factors. Adaptive reuse offers a sustainable solution by integrating modern functions into heritage buildings while preserving their historical and cultural significance (Kayhan Tunalı & Güneş, 2024). This approach not only extends the lifespan of such structures but also revitalizes them for contemporary use, fostering a deeper connection between the past and present (Alauddin et al, 2022). In Malaysia, traditional Malay houses are key examples of vernacular architecture, reflecting the cultural, social, and environmental values of the Malay community. These houses, characterized by elevated wooden structures, intricate craftsmanship, and climate-responsive designs, represent an important part of the nation's cultural heritage. However, many of these structures face the threat of neglect or irrelevance as societal needs and expectations evolve. In this context, adaptive reuse emerges as a potential strategy to balance heritage conservation with modern functionality. This study focuses on the Tok Abu Bakar Alang Ketak (TABAK) house, a prominent example of traditional Malay architecture located in Bota, Perak. Originally designed as a typical Malay dwelling, the TABAK house has undergone significant changes to accommodate contemporary needs. It now functions as a gallery, research center, community hub, and venue for cultural competitions, while still retaining its architectural and historical essence. This case study aims to explore how adaptive reuse can effectively promote the cultural heritage of the TABAK house while ensuring its relevance in modern functions for contemporary society.

RESEARCH BACKGROUND

The concept of adaptive reuse, in architectural conservation, involves repurposing traditional Malay houses for new functions without compromising their historical and cultural significance. This sustainable practice helps reduce the environmental and economic costs associated with demolition and new construction (Gravagnuolo et.al, 2024; Foster & Kreinin, 2020). In recent years, adaptive reuse approach has gained popularity as a means of preserving heritage buildings, including traditional Malay houses in Malaysia, especially those that have lost their original function due to changing societal needs. By adapting these traditional malay houses to modern uses, they can remain functional and relevant in contemporary settings, contributing to cultural sustainability, economic vitality, and community engagement. Additionally, adaptive reuse can serve as an academic and research hub, attracting conservation practitioners and students from around the world, fostering knowledge exchange and education on heritage preservation.

In the case of Malaysia, traditional Malay houses are essential components of the nation's architectural heritage. These types of buildings are not only representative of the Malay way of life but also represent the environmental adaptation of local building techniques. However, with modernization, many of these houses have fallen into disuse or decay, often due to changes in family structures, economic pressures, or rural-to-urban migration (Yueqiang Feng, 2024). The challenge lies in finding ways to preserve these cultural assets while making them adaptable to modern needs.

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The Tok Abu Bakar Alang Ketak (TABAK) house is an exemplary model of successful adaptive reuse in Bota, Perak, Malaysia. Originally built as a traditional Malay dwelling known as Rumah Limas Bumbung Perak, the house has been transformed into a multifunctional space that serves various community and academic purposes. The TABAK house is now home to a gallery showcasing local history and art, a research center for traditional Malay architecture, and a community hub that hosts events and competitions aimed at celebrating and preserving Malay culture. This transformation highlights the potential of adaptive reuse to not only preserve heritage but also foster a sense of identity and belonging within the local community.

This research examines the effectiveness of adaptive reuse in the context of the TABAK house, assessing both its architectural adaptations and its socio-cultural impacts. By analyzing the post-conversion performance of the house and its role in community engagement, the study aims to contribute to the broader discourse on sustainable heritage conservation. Additionally, the research offers insights into the challenges and opportunities associated with adapting traditional Malay houses for modern functions, providing valuable lessons for future conservation efforts.

LITERATURE REVIEW

Adaptive reuse is recognized as a crucial strategy for addressing the obsolescence and deterioration of heritage buildings, particularly traditional Malay houses. These houses are especially vulnerable to obsolescence and loss due to their timber construction, which is more prone to decay over time. Adaptive reuse involves repurposing buildings by modifying their original functions to suit new needs. This practice, while not new, plays an important role in preserving historic buildings. Such structures are valuable assets, contributing significantly to the economic, cultural, and environmental sustainability of rural areas, towns, and cities (Mohamed & Alauddin, 2023).

3.1 Definition of Adaptive Reuse

Adaptive reuse refers to the process of repurposing a site or building for functions other than those originally intended or designed. According to Douglas (2006), adaptive reuse can be defined as "any building work and intervention to change its capacity, function, or performance to adjust, reuse, or upgrade a building to suit new conditions or requirements." This practice is a critical strategy in maintaining and revitalizing existing buildings, especially when they have reached maturity within their lifecycle. Adaptive reuse offers significant economic, social, and cultural benefits by providing new purposes for structures, thereby enhancing their relevance in contemporary settings (Yueqiang Feng,2024). Furthermore, adaptive reuse is a key approach to sustainability, as it preserves the durability of original building materials and reduces the carbon footprint associated with demolition and new construction (Kayhan Tunali, 2024). This practice also addresses the conservation and preservation of built heritage, aligning with broader strategies and policies for sustainable development. Once a building's original purpose becomes inadequate for current functional

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or programmatic needs, adaptive reuse emerges as a viable and sustainable option for repurposing sites.

In the context of building adaptation, the term "adaptive reuse" has been widely interpreted and defined by numerous researchers (Ball, 2002; Mansfield, 2002; Douglas, 2006; Bullen, 2007). The concept is often synonymous with terms such as conversion, retrofitting, adaptation, refurbishment, and rehabilitation. Bullen (2007) describes adaptive reuse as "rehabilitation, renovation, or restoration work that does not necessarily involve a change of use," emphasizing its role in extending the useful life of buildings through a combination of improvement and conversion. Wilkinson and Reed (2008) further define "adaptive" as the process of maintaining as much of the original structure as possible while improving its performance to meet modern standards and evolving needs. Mansfield (2002) supports this view, stating that refurbishment involves conversion and describes a change in use, suggesting that "refurbishment" and "adaptive reuse" can often be used interchangeably in certain contexts.

3.2 Issues Related to Reuse the Traditional Houses

Adaptive reuse involves repurposing existing buildings, particularly older or historic structures, for new functions or uses. When considering the adaptive reuse of traditional Malay houses, several key issues must be addressed to ensure a successful adaptation. These issues, illustrated in Figure 1, include the balance between preserving cultural heritage and modernizing the structure, difficulties in maintaining architectural and structural integrity, and compliance with building codes and regulations. Additional concerns involve functionality and space planning, the suitability of materials for sustainable application, integration of modern infrastructure and utilities, community and stakeholder involvement and financial. Each of these factors is critical in ensuring that traditional Malay houses can be effectively repurposed while preserving their cultural and historical significance.

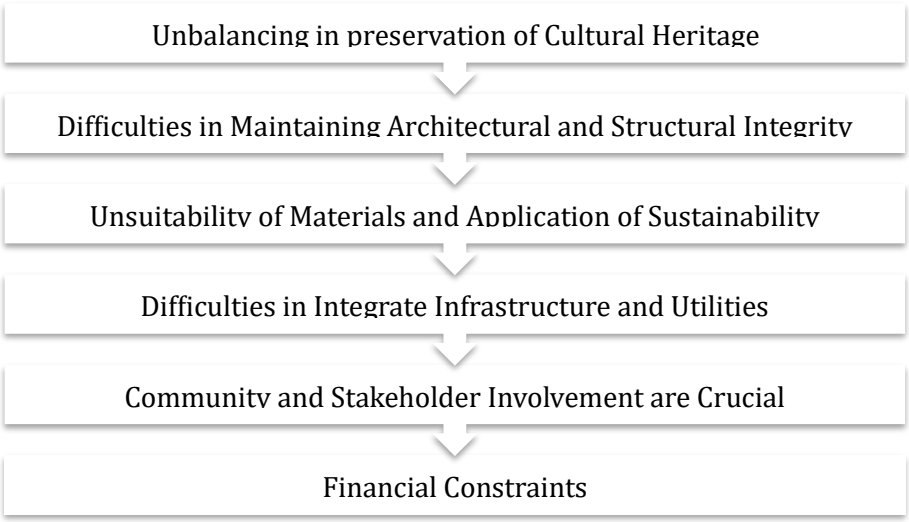


Figure 1: Issues in Adaptive reuse of Traditional Houses Source: Author

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Traditional Malay houses, distinguished by their unique architectural features and cultural significance, encounter considerable challenges during the adaptive reuse process, leading to potential unbalancing in their preservation. Key issues include structural modifications, where alterations made to meet modern needs may compromise the original design and craftsmanship. Additionally, the use of inappropriate materials during renovations can adversely affect both the longevity and aesthetic value of these traditional structures. Furthermore, as traditional uses evolve, there is a risk that the original cultural practices associated with these houses may be lost or diminished, thereby threatening their cultural relevance and heritage significance.

Maintaining the architectural and structural integrity of traditional Malay houses presents significant challenges during the adaptive reuse process. As these timber structures are repurposed for modern functions, they often require alterations that can compromise their original design, craftsmanship, and materials. The inherent characteristics of traditional Malay houses, such as their unique timber construction and intricate detailing related to symbolism, demand careful consideration to preserve their authenticity. Furthermore, ensuring the structural soundness of these aging buildings while implementing contemporary design elements can lead to conflicts that jeopardize both their historical value and functional viability (Yueqiang Feng, 2024). As a result, the delicate balance between modernization and preservation becomes increasingly difficult, underscoring the need for a thoughtful approach that respects the original architectural intent while accommodating contemporary needs.

The unsuitability of materials and the application of sustainability are critical factors in the adaptive reuse of traditional Malay houses. When adapting the traditional Malay houses, the choice of materials plays a pivotal role in maintaining their aesthetic and structural integrity. The use of modern materials that do not align with the original construction techniques can compromise the authenticity and longevity of the buildings, potentially leading to accelerated deterioration. Furthermore, the principles of sustainability must be integrated into the adaptive reuse process; this includes selecting eco-friendly materials that not only complement the traditional architecture but also enhance the building's energy efficiency (Sirror, 2024). A failure to prioritize suitable materials and sustainable practices can undermine the preservation efforts, diminishing the cultural value of these traditional Malay houses while also affecting their environmental impact.

ntegrating modern infrastructure and utilities into traditional Malay houses is a key difficulty throughout the adaptive reuse process. Traditional Malay houses were not initially built to accept modern utilities like plumbing, electrical wiring, and HVAC, which could compromise their architectural integrity. The introduction of modern services can necessitate costly alterations that may jeopardize the original design and craftsmanship of these structures (Yueqiang Feng, 2024). Furthermore, upgrading infrastructure to meet modern safety and building requirements might complicate integration, resulting in unpleasant installations that detract from the house's original charm. Furthermore, special effort must be paid to keeping the exterior's visual qualities while ensuring that necessary utilities are efficiently integrated. A careful approach is needed to strike a balance between the preservation of cultural heritage and modern conveniences. Solutions that respect the architectural elements and integrity of

traditional Malay houses while effectively satisfying modern utility requirements should be prioritized.

Community and stakeholder involvement are crucial for the successful adaptive reuse of traditional Malay houses. Engaging local communities in the decision-making process helps create a sense of ownership and connection to their cultural heritage, ensuring that preservation efforts reflect the values and needs of those most affected (Gravagnuolo et al, 2024). Additionally, involving local residents can help reduce resistance to change, as they are more likely to support projects that align with their cultural identity. Overall, encouraging participation strengthens community ties and enhances the success of adaptive reuse initiatives (Dasgupta & Shendkar, 2024), allowing traditional Malay houses to remain relevant while preserving the traditional Malay houses historic are importance.

Financial constraints significantly affect the adaptive reuse of traditional Malay houses, creating challenges that can hinder preservation efforts. Limited funding often restricts the scope of conservation projects, making it difficult to carry out necessary repairs or upgrades to meet modern standards. The costs associated with conserving these houses can be substantial, particularly when attempting to maintain their original architectural features and use appropriate materials. Additionally, securing financial support can be challenging, as funding sources typically prioritize new construction over the restoration of older buildings (Gravagnuolo et al, 2024). In many cases, owners must rely on their own funds to maintain these properties. Without adequate financial resources, the adaptive reuse process may lead to compromises that diminish the cultural and historical value of these houses. However, by addressing financial constraints through strategic planning and resource allocation, stakeholders and owners can ensure that traditional Malay houses are preserved and adapted for contemporary use while retaining their heritage significance.

3.3 Suitability of New Functions for Traditional Malay Houses

According to the layout of this traditional Malay house, its reuse potential is quite limited. Nevertheless, the concept of adaptive reuse remains flexible and can be seamlessly integrated with modernity to appropriately repurpose traditional Malay houses. As a result of the initial review through previous research, many traditional houses can be adapted for various functions, as illustrated in figure 2.

Figure 2 shows the most and east functions that used in traditional Malay Houses around Malaysia. The adaptive reuse of traditional Malay houses varies in terms of the functions assigned to these heritage structures. The most popular new functions typically include cultural centers, museums, galleries, and community hubs, where the emphasis is placed on preserving cultural heritage while providing public access and engagement (Daramola et al, 2024). These functions not only retain the architectural essence of the houses but also support community activities and tourism. On the other hand, the least common new functions tend to be commercial ventures such as retail spaces or modern office facilities (Dasgupta & Shendkar, 2024). This is largely due to the challenges of integrating modern

infrastructure, the need for substantial structural modifications, and potential conflicts with preserving the traditional architectural aesthetics and cultural significance of the buildings. These less popular uses are often seen as detracting from the historical and cultural value of traditional Malay houses, leading to their limited adoption.

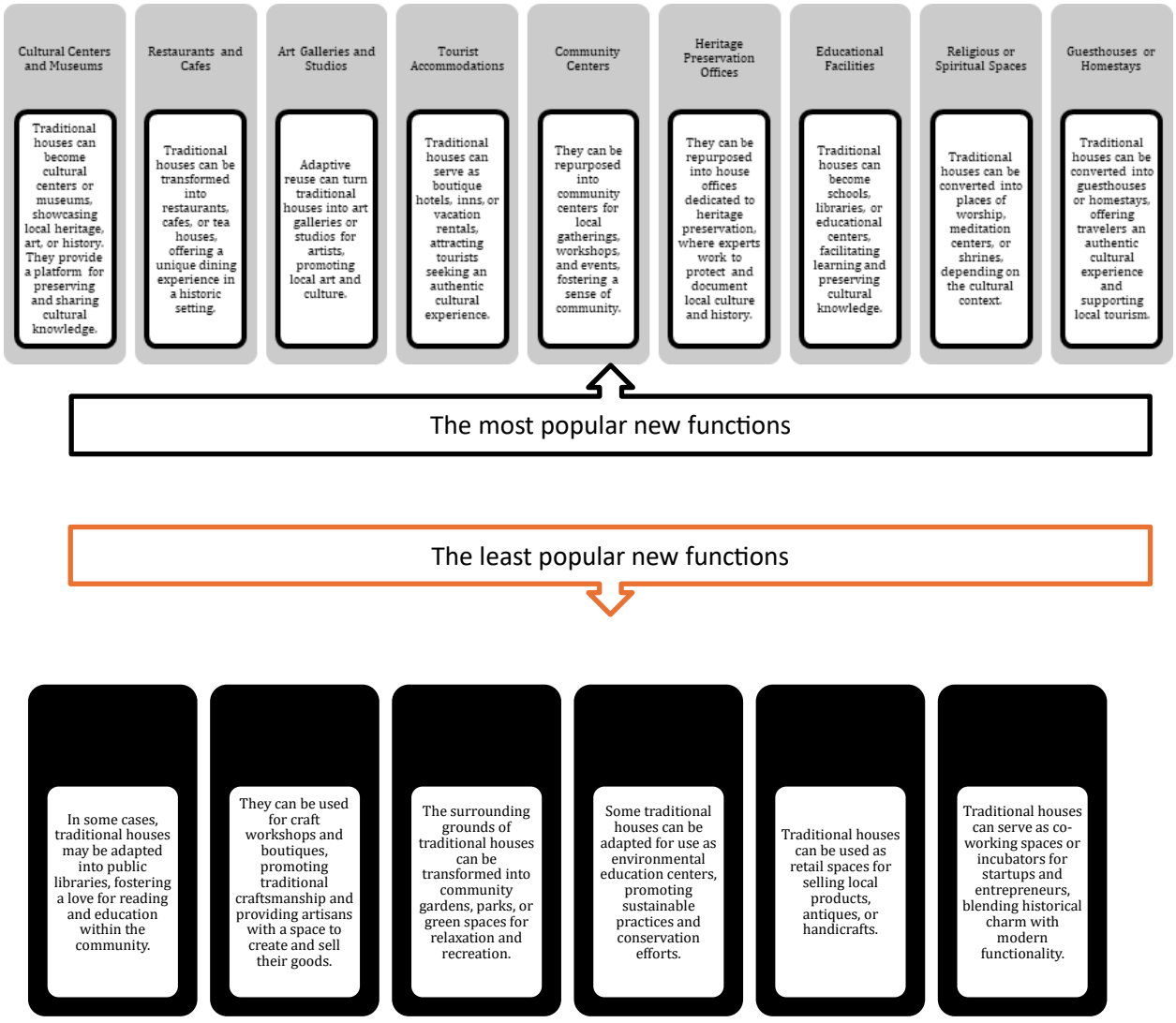


Figure 2: The Most and Least Popular New Functions for the Reuse of Traditional Malay Houses Source: Author

RESEARCH METHODOLOGY

Figure 3 shows how this study utilizes a combination of methodologies to execute and complete the research. The first step is development of research aim, research objective and research question. The next step involves an extensive review of scholarly literature on adaptive reuse and traditional houses in Malaysia, specifically focusing on the challenges that impede the reuse of traditional Malay houses. Next, targeted studies will be conducted to

explore viable new functions for repurposing these historic structures, identifying the most suitable modern uses. To provide practical insights, a case study of the Tok Abu Bakar Alang Ketak house in Bota, Perak, will be conducted. This case will serve as a successful example of adaptive reuse, demonstrating how the house has been reimagined for various contemporary functions, as shown in Figure 3.

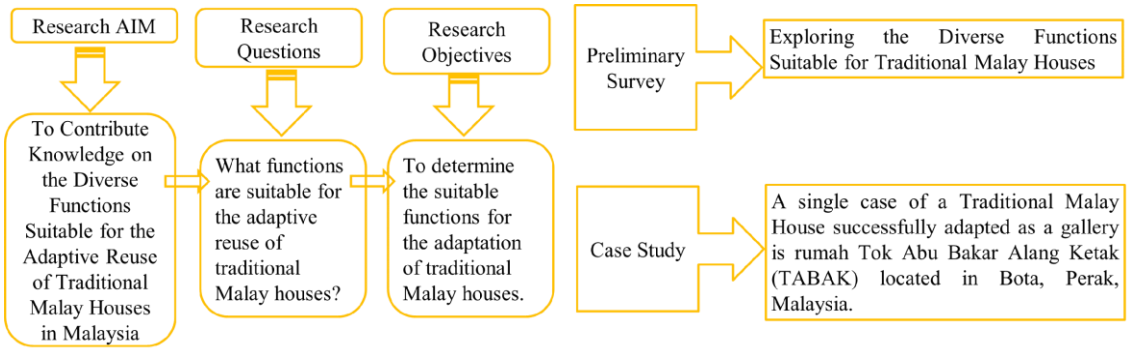


Figure 3: The Research Methodology Flow

CASE STUDY OF RUMAH TOK ABU BAKAR ALANG KETAK (TABAK), BOTA, PERAK

4.1 Background

This house is located on the banks of the Perak River in Bota Kiri within the sub-district of Bota, Perak Darul Ridzuan. It was built by the homeowner, Tok Abu Bakar Alang Ketak, along with several other craftsmen in the 1920s. The house was constructed in the architectural style known as the Perak Roofed Gabled House (Rumah Limas Bumbung Perak or RLBP). This architectural style is prevalent throughout the state of Perak, especially along the Perak River.



Figure 4: TABAK in 1920s Source: Owner's Document

From a geographical perspective, this house is situated on the banks of the Perak River at coordinates 4°20'47.6"N 100°52'35.6"E (4.346545, 100.876559) in Bota Kiri, Sub-District of

Bota, Central Perak District, Perak Darul Ridzuan. Similar to many traditional houses in Perak, it is river-oriented, with its front facing the river. The river is a significant element in the development of settlements. Besides being a water source, the river serves as the primary transportation route connecting villages and small towns along the Perak River. It is a vital source of local and regional economic activity. The TABAK house is designed with several essential spaces, including the veranda, entrance hall, the Mother's Room (Rumah Ibu), the Selang Room, and the Kitchen House (Rumah Dapur).

4.2 Conservation Works

In 2019, TABAK underwent a conservation effort, transforming it into a gallery and educational hub dedicated to traditional houses, traditional architecture, and related subjects. Since then, a range of activities and events have taken place at TABAK from 2019 to 2023.



Figure 5: TABAK house at Bota, Perak Source: Owner's Document

4.3 Reuse Activities in TABAK

Since the pandemic, the TABAK house has hosted numerous activities, particularly related to education and research. UiTM and other local universities have participated in these events, including painting competitions, which have significantly increased the house's visibility and popularity. As previously mentioned, traditional Malay houses can be adapted for various new functions. The TABAK house exemplifies this success, having undergone conservation and been repurposed for multiple uses. It now serves as a center for academic activities, history workshops, and painting contests, where it acts as the competition hub. Additionally, TABAK has been transformed into a gallery showcasing paintings and artwork, attracting history enthusiasts and art lovers alike.

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4.4 Educational Activities

Through participant observation and photo documentation, it was found that educational activities at TABAK have involved architecture and art students from both private and government universities. TABAK has become a focal point and model for students, serving as the inspiration for their drawings and artwork, particularly in painting and drawing competitions. In addition, lecturers and presenters have used the site to demonstrate drawing techniques to new students, offering a hands-on learning experience that differs from traditional studio or classroom settings. This approach provides a direct and immersive connection to traditional architecture, allowing students to incorporate real-life elements of the TABAK house into their creative work. This has enhanced their understanding of traditional Malay architectural forms in a practical and engaging manner.



Figure 6: Drawings Competition and Sketching demonstration in TABAK

4.5 Workshop and Gallery Activities

Between 2022 and 2024, TABAK has actively served as a venue for workshops involving both government and private sector participants. Among the activities held was an archaeology workshop that utilized equipment to identify historical artifacts potentially buried around the TABAK house. The workshop participants included local community members, university lecturers, and government bodies such as the Ipoh City Council. Through these archaeological activities, several artifacts were uncovered, including old coins and broken pottery around the TABAK grounds. This discovery marked a significant achievement for TABAK, successfully engaging with the broader industry in heritage conservation efforts.



Figure 7: The Workshop and Galleries at TABAK

4.6 Competition Activities

In early 2023, TABAK became the venue for a notable coloring competition organized by the Fine Arts Department of Universiti Teknologi MARA (UiTM). This competition was not limited to students but was open to participants nationwide, attracting both enthusiasts of traditional Malay houses and those studying Malay heritage architecture. The contest focused on the unique symbols and motifs present in TABAK, which served as the central theme for the coloring entries. The event gained attention in newspaper articles, promoting it to a broader audience and recognizing it as a successful initiative that rebranded TABAK with new functions. This effort has also helped inspire younger generations to engage with and appreciate the historical significance of TABAK.



lokal

Perkenal nama Rumah Tabak

Pensyarah anjur pertandingan lukis rumah limas bumbung Perak untuk dedah keunikan seni bina

Figure 8: The Painting Competition Activities at TABAK

4.7 Arts and Research Galleries

TABAK also hosts exhibitions of paintings and posters that evaluate the history of the Malay Peninsula, including the architecture of Malay houses. These exhibitions are ongoing, attracting academics who visit to view the informative displays. In addition to the exhibitions, there are briefings on conservation efforts conducted by the owner of TABAK, who is passionate about Malay architecture. These activities not only enhance knowledge but also foster a deeper appreciation for the cultural heritage represented in the displays.

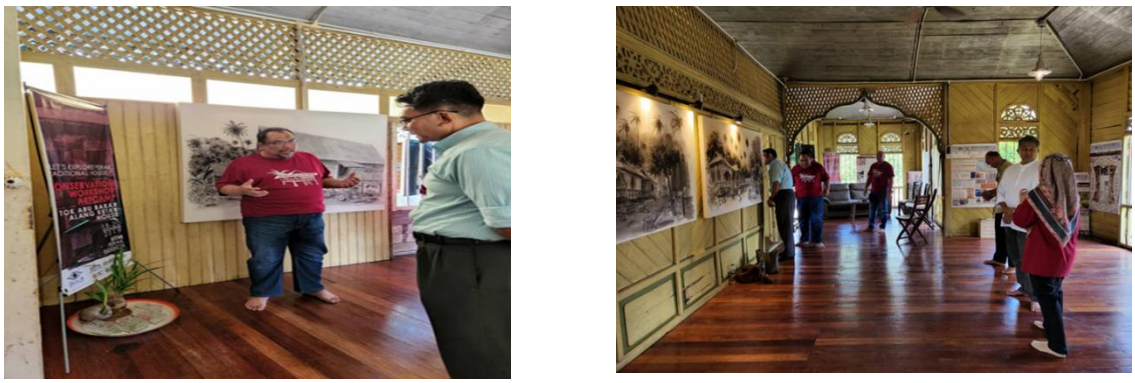


Figure 9: Art and Research Gallery in TABAK

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4.8 International Student Workshop of Vernacular Architecture

The latest function of TABAK is to serve as a venue for international student workshops, which are part of the 15th Nusantara Symposium held on October 7 and 8, 2024. This event features various activities involving UiTM alumni and international students from Indonesia, particularly those from Universitas Bung Hatta and Universitas Islam Negeri Alauddin Makassar. Among the activities conducted are conservation efforts, bamboo house construction, bamboo sculptures, and paintings that incorporate the architectural elements of TABAK. This initiative not only positions TABAK as a catalyst for international collaboration among students but also promotes similar academic activities. Additionally, artists have gathered at TABAK for the same purpose, further enriching the cultural exchange and learning experience.



Figure 10: International Students Workshop on Vernacular Architecture in TABAT

CONCLUSION

Adaptive reuse of traditional houses provides an opportunity to celebrate and preserve cultural heritage while revitalizing historic structures. However, successful transformation requires careful planning, collaboration with experts, and a profound understanding of the cultural, architectural, and historical significance of the house. Additionally, adaptive reuse enriches communities by creating spaces for cultural, educational, and economic activities. The selection of new functions typically depends on the house's location, its historical significance, and the needs and aspirations of the local community. This research serves as a preliminary step towards future heritage national grant applications.

ACKNOWLEDGEMENT

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REFERENCES

Alauddin K, Mohd Nusa F.N, Baharuddin MN, Abdul Rashid MS, Ramli RR, (2022). The Application of Green Adaptive Reuse Of Historical Buildings In Unesco Cities. Journal of the Malaysian Institute of Planners, volume 20 Issue 3, Page, 184–195

Ball, R. M. (2002). Re-use potential and vacant industrial premises: revisiting the regeneration issue in Stoke-on-Trent. Journal of Property Research, vol 19, no. 2, pp. :93-110.

Bullen, P. A. (2007). Adaptive reuse and sustainability of commercial buildings. Journal of Facilities, Vol. 25,no. ½, pp. :20 - 31.

Daramola O. F., Babamboni A. S., Owolabi T. O. S., Ajayi O. O (PhD), 2024, Exploring The Integration Of Adaptive Reuse In Interior Design: A Case Study Of Caleb University Administrative Building, Volume 7, Issue 1(06 - 2024), https://www.doi.org/10.26772/cijds-2024-07-01-015

Dasgupta N. & Shendkar Eesha M., 2024, Preserving The Past, Shaping The Future: Strategic Planning For Adaptive Reuse In India's Heritage Precincts And Its Impact On Heritage Areas, Proceeding International Conference On Climate Change, Cultural Heritage and Sustainable Habitat, February 17 – 18, 2024, Patna, India

Douglas, J (2006). Building Adaptation. 2nd edn. Butterworth-Heinemann, Oxford and Burlington, MA.Elsevier, Ltd. Available from: Elsevier books [15 November 2015]

Foster G., H. Kreinin 2020, A review of environmental impact indicators of cultural heritage buildings: A circular economy perspective, Environmental research letters, 10.1088/1748-9326/ab751e

Gravagnuolo A, M. Angrisano, M. Bosone, F. Buglione, P. De Toro, L. Fusco Girard, 2024. Participatory evaluation of cultural heritage adaptive reuse interventions in the circular economy perspective: A case study of historic buildings in Salerno (Italy), Journal of Urban Management, Volume 13, Issue 1, Pages 107-139, ISSN 2226-5856

Kayhan Tunalı, S., & Güneş, S. (2024). Sustainability of Historical Buildings Through Reuse Projects: A Case Study of the Kadıköy District in İstanbul. DEPARCH Journal of Design Planning and Aesthetics Research, 3(1), 97-121.

Mansfield, J. R. (2002). What's in a name? Complexities in the definition of 'refurbishment', Journal of Property Management, vol. 20, no. 1, pp. :23-30.

Mohamed N, K Alauddin (2023), Decision making criteria for adaptive reuse strategy in UNESCO world heritage city. Journal of Facilities Management 21 (2), 169-181

Sirror, Hala. 2024. "Lessons Learned from the Past: Tracing Sustainable Strategies in the Architecture of Al-Ula Heritage Village" Sustainability 16, no. 13: 5463. https://doi.org/10.3390/su16135463

eISSN 3030-5543

Wilkinson, S. J. and Reed, R. G. (2008). 'The Business Case for incorporating Sustainability in Office Buildings: The Adaptive Reuse of Existing Buildings', Proceedings of 14th Annual Pacific Rim Real Estate Conference 2008, Kuala Lumpur, Malaysia, pp. :1-18.

Yueqiang Feng (2024), Architectural challenges of urban heritage conservation from a sustainable development perspective, Journal of Civil Engineering and Urban Planning, Clausius Scientific Press, Canada, ISSN 2616-3969 Vol. 6 Num. 1 DOI: 10.23977/jceup.2024.060107

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THE UNIQUENESS OF OLD SHOPHOUSES THYE ANN HOTEL AND RESTAURANT AT JALAN HILIR KOTA BHARU, KELANTAN

Mohd Azri Mohd Jain Noordin[1*], Mohammed Fadzli Maharimi[2], Noorul Huda Mohd Razali[3,] Salmiah Aziz[4] & Azizi Bahauddin[5]

[1,2,3,4]Affiliation: Faculty of Architecture and Ekistics, Universiti Malaysia Kelantan, 16300 Bachok, Kelantan, MALAYSIA.

[1,5]Affiliation: School of Housing, Building and Planning Universiti Sains Malaysia,11800 USM, Penang, MALAYSIA.

*Corresponding Author: azri.mjn@umk.edu.my **

Abstract: This research delves into the distinctiveness of old shop houses by focusing on an example The Thye Ann Hotel and Restaurant shophouses situated on Jalan Hilir, in Kota Bharu state of Kelantan in Malaysia. Traditional shop houses, in Malaysia carry cultural importance as they embody a mix of architectural legacy influenced by colonial times and communal beliefs. The Thye Ann Hotel and Restaurant shophouses serve as an illustration of these characteristics by reflecting the rooted history and identity of Kota Bharu state. This research used a method that involves conducting, on site observations and interviewing the building owner and experts to investigate the significance as well, as the cultural and historical values associated with these buildings. The research findings show that the design style of the Thye Ann Hotel and Restaurant shophouses blends elements, with colonial influences by incorporating features like tall ceilings and detailed cornices that were adjusted from Western styles to suit the tropical weather conditions. The frontage of the building displays characteristics such as pilasters and intricate carvings combined with design elements like timber and clay tiles. This blend of styles reflects the building's ability to adapt and its distinct identity, within Kota Bharu shophouses.

***Keywords*:** Colonial Architecture, Heritage Shophouses, Urban Identity, Malaysia

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INTRODUCTION

1.1 Background

Old shophouses, in Malaysia hold value as they showcase a fusion of architectural styles influenced by colonization and local histories (Mydin et al., 2014). The Thye Ann Hotel and Restaurant shophouses located at Jalan Hilir in Kota Bharu in Kelantan is a prime example of this architectural style It combines traditional design elements, with colonial aesthetics reflecting the city rich history and identity. As Malaysia's cities continue to grow and change quickly over time historic shophouses such, as this one are at risk of being replaced by buildings often because their cultural and colonial importance is not fully recognized in city planning. This issue is especially urgent in Kota Bharu, where the push for modernization puts the preservation of shophouses – to the city history – in jeopardy.

This research seeks to explore the cultural and colonial value of Thye Ann Hotel and Restaurant shophouses highlighting its importance, as a landmark. The research highlights the significance of integrating structures into present day to maintain a connection, to our past and uphold our identity It suggests methods to safeguard these structures while accommodating today's urban requirements.

LITERATURE REVIEW

2.1 Colonial Architectural Influences

The historical architecture, from times has greatly shaped the style in Malaysia by influencing the construction of traditional shophouses that combine European design elements with adaptations to suit the local environment well (Ju et al., 2015). These traditional shophouses from the period often showcase European features like ornate facades and windows with arches and pilasters. They exude an air of elegance while still retaining a welcoming feel due to their size. In adapting to Malaysia's weather conditions these structures feature adjustments, like open passageways called "five-foot ways." These covered paths offer shade for walks and protection from rain on the ground level. The tall ceilings promote air-flow, by letting hot air escape upward and cool breezes circulate. Additionally, walls and slatted windows are utilized to reduce heat inside the buildings. The fusion of design concepts and climate adaptive strategies gave rise to a style tailor made for Malaysia's surroundings (Omar & Syed-Fadzil, 2011). A harmonious mix of colonial elements, with functional adjustments that resonate with the region's essence.

2.2 Cultural Significance of Traditional Shophouses

In Malaysia landscape of traditional shophouses lies a rich cultural heritage that mirrors the tapestry of social and economic eras beyond their captivating architecture charm and beauty (Zwain & Bahauddin, 2017). These unique structures serve a function by intertwining commercial aspects under one roof—a design that nurtures a harmonious blend of work and

family life dynamics (Al-Mohannadi et al., 2020). In these homes turned businesses settings; families would run their enterprises on the ground level while embracing the comforts of home on the upper floors. This setup not offered benefits but also fostered a unique community spirit where locals resided and worked nearby each other to form lively neighborhoods. Traditional shophouses served as gathering spots where individuals met up exchanging items and forming connections that strengthened the community bond. (Yeap et al., 2013). Consequently, these structures stand as relics representing the routines and economic endeavors of by gone eras providing valuable glimpses into historical ways of life and family dynamics that still shape the local identity today (Schlecker, 2005).

2.3 Urban Heritage and Identity

Preserving heritage buildings is crucial, for maintaining a city's charm and old shophouses contribute significantly to the character of areas in Malaysia (Rani et al., 2018). As urban areas undergo modernization and growth these historic structures like traditional shophouse play a role in linking the past with the present anchoring identities in a sense of historical flow (Azmi et al., 2017). These constructions promote a feeling of attachment and connection to the locality not for established residents but, for future generations and tourists alike. Urban planning that incorporates buildings helps cities maintain their heritage and adds a touch of history and culture to modern urban growth settings. By preserving these structures and blending them with developments, in cities honor the past while embracing progress to create spaces where tradition and innovation blend seamlessly (Boussaa, 2017). Keeping buildings like shophouses contributes to a sustainable urban identity balancing the old ways, with new advancements and enriching the cultural tapestry of city landscapes (Faudzi, 2019).

METHODOLOGY

3.1 Research Design

This research used a method that combines observing and conducting interviews to delve into the architectural and cultural elements of the Thye Ann Hotel and Restaurant shophouses, in Kota Bharu. Observations on site center on details that showcase a blend of local styles such as high ceilings, arched windows, and intricate cornices. Interviews with the building owner and experts from the area shed light on the importance and cultural significance of the building while providing insights into its contribution, to Kota Bharu identity. The information collected from observing and interviewing individuals is subsequently examined to emphasize themes that shed light upon the role of heritage values, in maintaining heritage and urban identity.

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RESULTS

4.1 Building History

The Thye Ann Hotel and Restaurant shophouses can be found on Jalan Hilir, in Kota Bharu Kelantan. Serves as a representation of the traditional shophouse style in the areas historical and cultural context. Figure 1 shows the overall view of the Thye Ann Hotel and Restaurant shophouse. Built in either the late 1800s or early 1900s this structure embodies the rich heritage of Kota Bharu. The front display showcases features, like windows, decorative plaster details, and lively hues that mirror the communities' customs. Thye Anns architectural layout blends style, with craftsmanship by incorporating lofty ceilings for better airflow in the warm weather and extended eaves for shading purposes. The indoor areas are carefully crafted to serve both as a restaurant for guests and as living spaces of shophouses. This versatile use does not emphasize the buildings significance, in the area but also demonstrates the flexibility of shophouse architecture. Figure 2 shows the detailed architectural study of the Thye Ann Hotel and Restaurant shophouse.



Figure 1: Displays a complete view of the Thye Ann Hotel and Restaurant shophouse.

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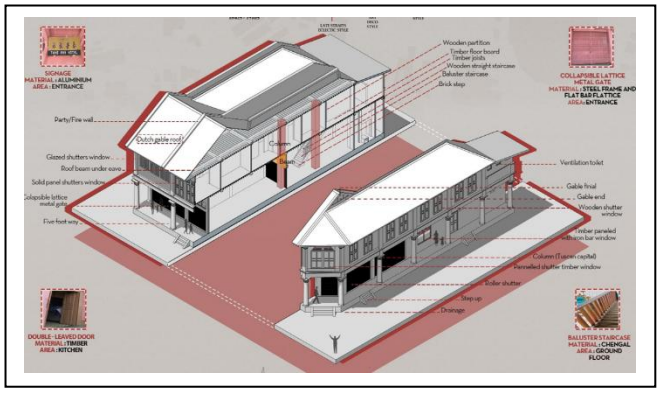


Figure 2: The comprehensive building study of the Thye Ann Hotel and Restaurant shophouse.

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4.2 Architecture Analysis

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An, in depth exploration of the importance of the Thye Ann Hotel and Restaurant shophouses is offered to give a view of its significance. The research delves into elements such as the design and layout as well as the choice of materials and decorative elements that collectively highlight the distinctiveness of the structure, within its historical backdrop. Table 1 showcases the outlines characteristics of the Thye Ann Hotel and Restaurant shophouses and its importance, as a heritage site clearly.

4.3 Facade Design

The exterior of the Thye Ann Hotel and Restaurant shophouses showcases a mix of colonial design elements that give it a unique charm and historical relevance, with detailed cornices and decorative details like balustrades and elongated windows adding to its character. The architecture tells a tale of fusion, by blending European aesthetics with local craftsmanship in a way that not only makes the building visually appealing but also highlights the varied influences that have contributed to Kota Bharu architectural heritage.

4.4 Layout

The Thye Ann Hotel and Restaurant shophouses has been planned with two stories, in mind to blend residential areas together. This unique layout pays homage to the shophouses in the region where families resided above their shops. The open design promotes airflow and sunlight penetration to combat Malaysia's weather. This holistic approach sets the Thye Ann Hotel and Restaurant shophouses apart, from neighboring shophouses that typically have a layout.

4.5 Materials

The Thye Ann Hotel and Restaurant shophouses design incorporates a mix of traditional brickwork, plaster and timber sourced locally and representative of construction methods, from the region's history. A choice that does not add to its visual appeal but also ensures its strength and longevity by following historical building practices prevalent during its inception period.

4.6 Ornamental Details

The intricate and skillfully crafted ornamental elements, at Thye Ann Hotel and Restaurant shophouses stand out for their design and historical significance with the era in mind. The exquisite cornices and balustrades that adorn the building does not add to its charm but also showcase the craftsmanship of the skilled artisans involved in its construction. In a departure, from the styles seen in shophouses the ornate beauty of Thye Ann Hotel and Restaurant

shophouses provides a window into history paying homage to the creativity and cultural richness of its time.

Table 1: Architectural Features of Thye Ann Hotel and Restaurant shophouses

No.	Material	Description
1.	*Facade design.*	A harmonious blend of colonial and Chinese influences with ornate elemen including intricate cornices, decorative balustrades, and elongated windows.
2.	*Layout.*	Three-story structure allowing for integrated commercial and residential spaces, facilitating natural ventilation and light, reflective of traditional shophouse design.
3.	*Materials.*	Constructed using locally sourced brick, timber, and plaster, enhancing aesthetic qualities and structural integrity while showcasing traditional building practices.
4.	*Ornamental details.*	Notable for intricacy, featuring elaborate cornices and balustrades that highlight colonial heritage, celebrating craftsmanship and artistry from the period.

4.7 Breakdown of Materials and Design Methods

The choice of traditional brick, for the walls paired with a lime plaster finish enhances the buildings charm and longevity. The sloping roof topped with tiles showcases an architectural characteristic of that era and helps efficiently drain rainwater in the tropical weather. The curved wooden windows do not add to the facade's beauty. Also aid, in ventilation to keep indoor temperatures cozy and pleasant. The craftsmanship shown using floorboards is evident, in the strength and visual appeal created by the tongue and groove joinery method. Table 2 showcases the summarizes characteristics of the Thye Ann Hotel and Restaurant shophouses and gives a comprehensive look at its historical value as a heritage structure.

Table 2: Materials and Design Methods Used in Thye Ann Hotel and Restaurant shophouses

No.	Material	Description	Design Method
1.	*Wall structure.*	Red brick with plaster finish.	Load-bearing masonry.
2.	*Roof.*	Gabled roof with tiles.	Traditional pitched roofing.
3.	*Windows.*	Arched timber frames with louvres.	Custom carpentry.
4.	*Flooring.*	Wooden floorboards.	Tongue and groove joinery.

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4.8 Cultural Insights

Through interviews, with the building owner and experts it was discovered that the Thye Ann Hotel and Restaurant shophouses played a role in serving as a hub for gatherings over time. People emphasized its importance as a spot for connections and cultural events that were essential in shaping the community's identity. Moreover, the hotels longstanding history as a family operated business highlights its contribution, to upholding customs and ensuring coherence within the cityscape. The significance of the Thye Ann Hotel and Restaurant shophouses goes beyond its prominence serving as a representation of the communities shared history and sense of identity.

DISCUSSION AND CONCLUSION

5.1 Significance of Heritage Buildings

The Thye Ann Hotel and Restaurant shophouses showcase the importance of heritage buildings, in environments in Kota Bharu. The old shophouses do not just stand as structures, they hold within them the rich history and cultural essence of the city. These buildings act as symbols of the past that tell a tale, about the community and how architectural designs have changed over the years to mirror changes. Blending colonial styles, with design elements creates a tapestry that enriches the cityscape and underscores the significance of historic structures such, as Thye Ann Hotel and Restaurant shophouses in capturing Kota Bharu unique identity.

5.2 Architectural and Cultural Identity

The Thye Ann Hotel and Restaurant shophouses architecture incorporates ceilings and intricate facades not for looks but also for adapting to the local climate and way of life effectively. It seamlessly combines colonial style design, with sourced materials to showcase both elegance and functionality, in form. This fusion creates an ambiance that celebrates the city heritage and resonates with both locals and tourists alike. These structures enrich the story by holding tales of yesteryears and meeting the requirements of the community.

SUMMARY

In summary the Thye Ann Hotel and Restaurant shophouses emphasizes the importance of heritage shophouses, in maintaining the city characteristic. Their unique architectural style that blends local elements stands as a tribute to the area's historical past. As Kota Bharu and other cities in Malaysia progress, towards modernization it becomes crucial to promote regulations that safeguard the preservation of structures. These measures will help guarantee that upcoming generations are able to stay linked to the past and develop an understanding of the historical stories that define their societies.

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REFERENCES

Al-Mohannadi, A S., Furlan, R., & Major, M D. (2020). A Cultural Heritage Framework for Preserving Qatari Vernacular Domestic Architecture. Multidisciplinary Digital Publishing Institute, 12(18), 7295-7295. https://doi.org/10.3390/su12187295

Azmi, N F., Ali, A S., Zaini, S F., Harumain, Y A S., & Abdullah, M. (2017). Character-Defining Elements of Shophouses Buildings in Taiping, Perak. University of Malaya, 139-149. https://doi.org/10.22452/jdbe.sp2017no1.12

Boussaa, D. (2017). Urban Regeneration and the Search for Identity in Historic Cities. Multidisciplinary Digital Publishing Institute, 10(1), 48-48. https://doi.org/10.3390/su10010048

Faudzi, Y M. (2019). Examining Factors Influencing Architectural Interventions On Shophouse Façade In Kota Bharu, Kelantan. , 2(9), 11-20. https://doi.org/10.35631/ijmtss.29002

Ju, S R., Kim, B M., & Ariffin, S I. (2015). Continuation and Transformation of Traditional Elements in Colonial Vernacular Houses in Kampong Bharu, Malaysia. Taylor & Francis, 14(2), 339-346. https://doi.org/10.3130/jaabe.14.339

Mydin, M A O., Keling, N A., Sani, N M., & Abas, N F. (2014). Assessment of Adaptive Reuse of Heritage Shop Houses for Sleep Lodging in Malaysia: Fulfilment of Conservation Guidelines. EDP Sciences, 11, 01014-01014. https://doi.org/10.1051/shsconf/20141101014

Omar, N A M Y., & Syed-Fadzil, S. (2011). Assessment of Passive Thermal Performance for a Penang Heritage Shop house. Elsevier BV, 20, 203-212. https://doi.org/10.1016/j.proeng.2011.11.157

Rani, W N M W M., Tamjes, M S., & Wahab, M H. (2018). Governance of Heritage Conservation: Overview on Malaysian Practice. 847-851. https://doi.org/10.32861/jssr.spi6.847.851

Schlecker, M. (2005). Going Back A Long Way: 'Home Place', Thrift And Temporal Orientations In Northern Vietnam. Wiley, 11(3), 509-526. https://doi.org/10.1111/j.1467-9655.2005.00248.x

Yeap, June Yi C., Thio, Tian Zhen C. and Mohamad Salleh , N. A. (2013). Shophouse Spirit : Layered Living in Modern Singapore. Nanyang Technological University. https://dr.ntu.edu.sg/handle/10356/52519

Zwain, A., & Bahauddin, A. (2017, July 18). The Sustainable Architectural Values Of Eclectic Style Shophouses Case Study: Sun Yat Sen Museum Penang, Malaysia. Institut Seni Budaya Indonesia Bandung, 27(2). https://doi.org/10.26742/panggung.v27i2.253

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PASSIVE COOLING METHODS; A COMPARATIVE STUDY OF TRADITIONAL MALAY HOUSE AND SEMI-DETACHED MODERN HOMES

Rania Yushinie Ramlan[1], Yuhainis Abdul Talib[2*] & Fazidah Hanim Husain[3]

[1,2,3]Affiliation: Department of Built Environment Studies and Technology, College of Built Environment, Universiti Teknologi MARA, Perak Branch, 32610, Seri Iskandar, Perak, MALAYSIA

*Corresponding Author: anis500@uitm.edu.my**

Abstract: Traditional Malay houses incorporate passive cooling techniques, such as elevated floors and wide verandas, which naturally regulate indoor temperatures and reduce reliance on mechanical systems. However, modern housing, influenced by urbanization and globalization, risks eroding Malaysia's cultural heritage and indigenous architectural principles. As urban areas increasingly favor modern designs, it is crucial to assess how these newer homes can offer similar cooling benefits while maintaining sustainability. Modern houses often depend on air conditioning, leading to higher energy consumption and environmental impact. This study aims to compare passive cooling methods in traditional Malay houses with those in modern semi-detached homes in Malaysia. Fieldwork measurements and observations serve as the primary research tools, focusing on traditional Malay houses in Perak and modern homes in Selangor. The study examines factors such as building orientation, ventilation rates, types, and material usage to highlight the effectiveness of traditional cooling methods. It also explores how these strategies could be integrated into contemporary housing designs. Ultimately, the research provides insights into how incorporating traditional passive cooling techniques into modern homes can enhance thermal comfort while reducing energy consumption. This study aims to inform sustainable architectural practices, preserve cultural heritage, and guide policies for more environmentally friendly housing solutions in tropical climates like Malaysia.

***Keywords*:** Passive Design, Passive Cooling, Thermal Comfort, Traditional Malay House, Ventilation & Orientation.

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INTRODUCTION

1.1 Research Background

Ensuring thermal comfort in regions like Malaysia with its tropical climate is essential. Traditional Malay houses are known for naturally regulating temperature without energy-intensive solutions like air conditioning. With the rise of modern housing, it's crucial to assess whether these structures can provide similar cooling effects while maintaining sustainability. This comparison of passive cooling strategies in traditional versus modern houses is a key focus in architectural studies. Traditional Malay houses prioritize passive cooling techniques such as natural ventilation and shading, utilizing local materials and features like elevated floors and well-placed windows to optimize airflow (Al-Tammi & Syed Fadzil, 2011; Sadafi et al., 2011). In contrast, modern developments often prioritize aesthetics over sustainability, relying more on mechanical cooling systems, which increases energy consumption and contributes to environmental degradation (Wong et al., 2019; Hien et al., 2000; Bogota et al., 2011). This dependence on artificial cooling exacerbates urban heat island effects (Zr & Mochtar, 2013). Therefore, adapting passive cooling strategies from traditional Malay houses is a complex challenge that intersects architectural design, environmental sustainability, and cultural heritage preservation, offering valuable insights for shaping policies that promote sustainable living in tropical climates.

1.2 Problem Statement

The adaptation of passive cooling strategies from traditional Malay houses to modern semi-detached homes raises critical architectural and environmental concerns. Al-Tammi and Syed Fadzil (2011) and Sadafi et al. (2011) highlight the effectiveness of traditional Malay houses in naturally regulating temperature through passive cooling techniques like ventilation and shading. However, modern housing, driven by urbanization and globalization, often relies on mechanical ventilation systems, as noted by Bogota et al. (2011) and Hien et al. (2000), which can exacerbate environmental degradation and urban heat island effects while disregarding traditional design practices. Additionally, Zr and Mochtar (2013) emphasize the importance of addressing socioeconomic factors, particularly for low-income households in Malaysia, by comparing indoor thermal comfort in traditional and modern homes. The integration of passive cooling strategies thus presents a multifaceted challenge that spans architectural design, environmental sustainability, cultural heritage preservation, and socioeconomic considerations. By exploring these issues, researchers can uncover opportunities to blend traditional wisdom with modern innovations, promoting sustainable and resilient housing solutions across Malaysia.

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1.3Objectives of Research

The objectives of this research are as follows:

1. To compare passive cooling strategies such as building orientation, ventilation rate, ventilation type, and material usage between traditional Malay houses and modern semi-detached housing in Malaysia.
2. To evaluate the effectiveness of traditional Malay passive cooling techniques in naturally regulating indoor temperatures in a modern home.

LITERATURE REVIEW

2.1 Building Orientation

Traditional Malay houses exemplify a profound understanding of environmental dynamics, optimizing natural elements for thermal comfort through careful orientation to harness prevailing winds and minimize direct sunlight (Al-Tammi & Syed Fadzil, 2011). This design reduces heat buildup and ensures consistent ventilation, allowing for cooler indoor environments without mechanical systems, reflecting both sustainability and cultural identity. Additionally, the strategic placement of windows enhances passive cooling by capturing breezes, particularly in coastal areas, thus reducing reliance on energy-intensive cooling systems (Sadafi et al., 2011). Integrating these traditional strategies into modern architectural practices can provide valuable insights for creating climate-responsive and energy-efficient buildings aligned with broader sustainability goals.

2.2 Ventilation

2.2.1 Natural Ventilation

Natural ventilation has been a key feature of traditional Malay house design, tailored to the region's climate and cultural practices. Architectural elements like raised floors, wide eaves, and louvered windows facilitate effective airflow, promoting cooling through cross-ventilation and reducing indoor humidity (Kamaruzzaman et al., 2011; Kamal et al., 2015). The use of natural materials such as timber and bamboo enhance ventilation by allowing breathability in the building's structure (Ismail et al., 2019). Beyond thermal comfort, natural ventilation supports occupant health by improving air quality and reducing indoor pollutants (Al-Tammi & Syed Fadzil, 2011). This passive cooling approach aligns with sustainable practices, lowering energy consumption and mitigating carbon emissions (D'Alessandro et al., 2017), offering valuable insights for modern energy-efficient design.

2.2.2 Types of Ventilation

Ventilation is a crucial passive cooling method in Malaysia's tropical climate, enhancing thermal comfort and indoor air quality. Natural ventilation relies on wind and buoyancy forces,

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allowing buildings to facilitate fresh air entry and stale air expulsion, reducing the need for mechanical cooling (Givoni, 1994). Cross ventilation, which uses pressure differentials to drive airflow through openings on opposite sides of a structure, improves indoor air movement (Nicol & Humphreys, 2002). Optimizing this method involves careful building orientation and strategic placement of openings to capture prevailing winds (Tan et al., 2020). Additionally, stack ventilation leverages warm air rising through higher openings to draw in cooler air from lower levels, beneficial for taller structures (Santamouris, 2006). Hybrid systems combining natural and mechanical methods enhance cooling performance while minimizing energy use (Heiselberg, 2009). Together, these strategies effectively manage indoor temperatures and provide sustainable, energy-efficient solutions for the region's climatic challenges.

2.2.3 Ventilation Rate

Ventilation is essential for passive cooling in Malaysia's tropical climate, which features high temperatures and humidity. Effective ventilation mitigates heat buildup and maintains indoor comfort without heavy reliance on mechanical systems. Research by Abdullah et al. (2018) emphasizes the importance of strategically positioned openings, raised floors, and high ceilings in traditional Malay houses to promote natural airflow and enhance thermal comfort. In modern semi-detached homes, ventilation is similarly vital. A study by Tan et al. (2020) shows that ventilation rate, combined with building orientation and features like operable windows and vents, significantly influences indoor temperature and comfort. Furthermore, Malaysia's Uniform Building By-Law (UBBL) sets minimum ventilation standards to ensure adequate airflow and indoor air quality, improving occupant comfort and promoting sustainable design. Overall, optimizing ventilation rates is crucial for enhancing passive cooling, improving thermal performance, and reducing environmental impact in Malaysian buildings.

2.3 Shading Devices

Shading devices, such as eaves, overhangs, and awnings, have long been essential in traditional Malay houses to manage solar heat gain and glare, enhancing thermal comfort. Al-Tammi and Syed Fadzil (2011) emphasize that these features regulate sunlight entering the interior, reducing the need for artificial cooling. By strategically positioning shading elements, architects achieve a balance between daylight and shading, maintaining comfort without sacrificing outdoor views. Studies confirm the effectiveness of shading in lowering solar radiation and improving indoor thermal conditions, contributing to energy efficiency by reducing reliance on mechanical cooling (Al-Tammi & Syed Fadzil, 2011). These passive design strategies continue to be valuable in contemporary architecture, offering functional and aesthetic benefits.

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2.4 Material Usage

Traditional Malay houses exemplify sustainable architecture using locally sourced materials like timber, bamboo, and palm leaves, which offer natural thermal regulation and durability (Omar et al., 2013; Sadafi et al., 2011). Timber's insulating properties and bamboo's renewable nature make them ideal for construction, while palm leaves provide effective sun protection due to their reflective surface (Fathi et al., 2015; Johari et al., 2017). These houses also incorporate passive cooling strategies such as raised floors and open layouts, promoting airflow and preventing heat buildup (Omar et al., 2013; Sadafi et al., 2011). This approach aligns with contemporary green building principles, blending cultural heritage with energy efficiency and climate resilience (Mohamed et al., 2019).

METHODOLOGY

3.1 Introduction

This chapter outlines the methodology for a comparative study on passive cooling methods in traditional Malay houses and modern semi-detached homes, focusing on fieldwork observations as the primary research tool to examine factors like orientation, ventilation, and material use. Data from a modern house in Damansara will be analyzed alongside secondary data from Affandi's (2023) study of the Rumah Kutai, a traditional Malay house in Perak. Both structures are in hot, humid climates, making this comparison crucial to understanding the effectiveness of passive cooling strategies in different architectural contexts.

The layout of the Rumah Kutai and the modern semi-detached house reveals key differences in their entrances and ventilation strategies. The Rumah Kutai has its main entrance on the east and a secondary entrance on the south side, while the semi-D house's entrances are on the north-east and south-west sides. The Rumah Kutai's openings are primarily on the north and south sides to facilitate cross-ventilation, whereas the modern house has openings mostly on the north-west side, lacking direct cross-ventilation due to a shared wall but compensating with strategically placed windows. Both houses use natural ventilation, though the modern house incorporates hybrid ventilation with ceiling fans instead of air-conditioning.

Material differences—timber for the Rumah Kutai and concrete for the modern house—affect the efficiency of passive cooling strategies, with orientation, openings, and ventilation being key to maintaining ideal indoor temperatures.

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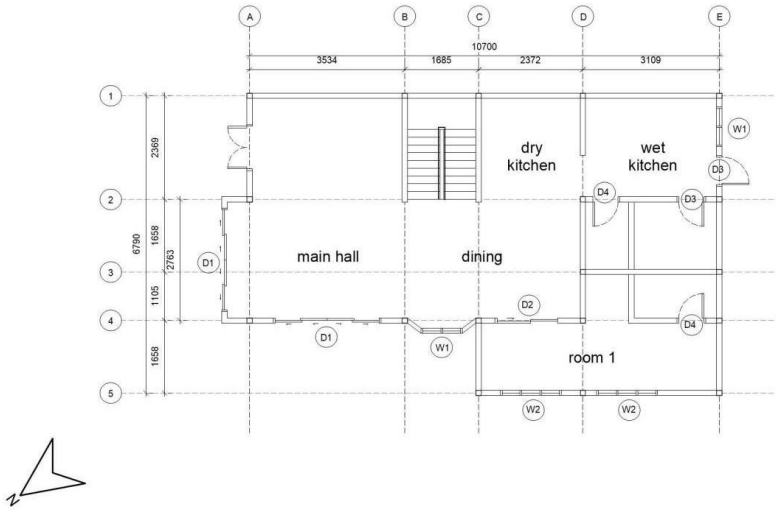


Figure 3.1: Layout of Traditional Malay House

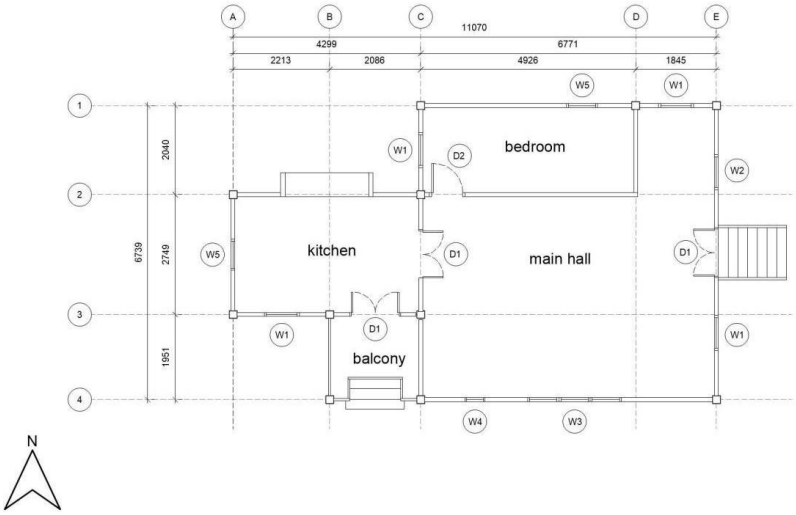


Figure 3.2: Layout of Modern Semi-Detached House

3.2 Research Approach and Design

In this research investigating passive cooling methods, a mixed method of quantitative and qualitative approach is adopted to comprehensively explore and compare traditional Malay houses with semi-detached modern homes (Smith, 2023; Johnson et al., 2022). Utilizing quantitative methodologies, the aim is to gain a holistic understanding of the efficacy and nuances of passive cooling strategies deployed in these architectural contexts (Brown & Lee, 2021). Quantitatively, measurements of temperature and airflow within the selected house will be recorded (Chang & Wang, 2020). Moreover, qualitative observations of architectural features and materials will be conducted to contextualize the quantitative findings (Jones, 2022).

By utilizing a quantitative and qualitative approach, this research seeks to provide valuable insights into the comparative effectiveness of passive cooling methods in traditional Malay houses and semi-detached modern homes, contributing to a deeper understanding of sustainable architectural practices in hot and humid climates (Garcia & Martinez, 2023). Consequently, two case studies have been selected, each demonstrating different applications of passive cooling methods, yet both situated within the same hot and humid tropical climate (Tan et al., 2021). Factors such as building orientation, prevailing wind direction, and fluctuations in solar position are integral to capturing the diverse nuances in the data, which will be subject to subsequent analysis (Lee & Ng, 2020).

3.3 Data Collection Methods

For the data collection in this study, two primary instruments were utilized: the 5-in-1 anemometer and the digital compass. Beyond mere instrumentation, extensive observational efforts were undertaken to thoroughly analyze and delineate the passive cooling strategies employed within the house, drawing insights from prior research endeavors. The digital compass played a pivotal role in establishing the North direction on-site, thereby facilitating the precise identification of window placements and the prevailing direction of airflow. Conversely, the 5-in-1 anemometer was employed to meticulously record both the temperature differentials and wind velocities within and outside the house premises. By integrating these instruments and observational techniques, a comprehensive understanding of the passive cooling criteria within the house was garnered, laying the groundwork for subsequent analysis and interpretation.

3.4 Data Analysis Method

A multifaceted approach was used to analyze data on passive cooling methods in traditional Malay houses and modern semi-detached homes. Quantitative data, such as temperature and wind velocity readings, were statistically analyzed to identify patterns related to factors like building orientation and airflow, while qualitative data from observations and interviews were thematically examined. A comparative analysis highlighted similarities, differences, and best practices between the two housing types. This integrated analysis provided insights into passive cooling methods, contributing to future architectural design in hot and humid climates.

DATA FINDINGS AND ANALYSIS

4.1 Introduction

This section analyzes data from the case study at a modern semi-detached house in Kota Damansara, comparing it to data from a previous study of the Rumah Kutai, a traditional Malay house. Temperature and wind velocity readings were recorded at 3-hour intervals using a 5-

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in-1 anemometer. Additional data on building orientation, window placement, and wind direction from a digital compass, along with window size measurements, are also examined. The analysis will assess whether traditional Malay passive cooling techniques effectively regulate indoor temperatures in modern homes.

4.2 Building Orientation Analysis

Figure 4.1 highlights the importance of building layout and orientation in passive cooling strategies, which can reduce the need for artificial cooling. The building's east-west orientation minimizes heat gain, with the bedroom on the cooler eastern side and main activity areas benefiting from cross-ventilation. The sun path shows how rooms receive beneficial morning sunlight while shading devices help reduce midday heat. Strategic window placement maximizes natural airflow, capturing cool morning and evening breezes for ventilation. These design choices, considering sun path, wind direction, and shading, enhance comfort and energy efficiency.

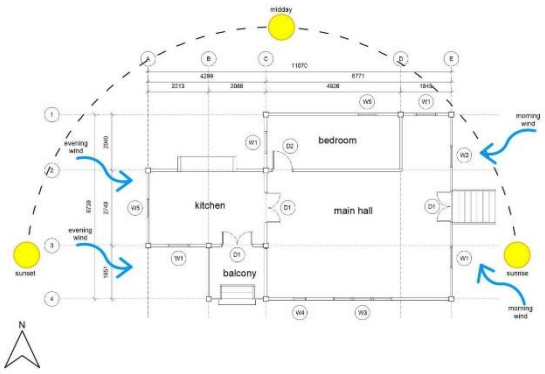


Figure 4.1: Traditional Malay House Building Orientation Analysis

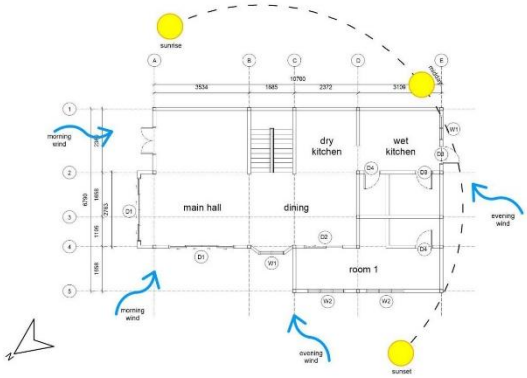


Figure 4.2: Modern Semi-Detached House Building Orientation Analysis

Figure 4.2 demonstrates passive cooling strategies through building orientation, sun path, wind direction, and window placement. The north-south orientation reduces heat gain by limiting direct sunlight on the longer walls, while morning sunlight warms the main hall, and shading devices protect west-facing rooms from intense afternoon heat. Natural

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ventilation is optimized by positioning windows and doors to capture morning and evening breezes, ensuring cross-ventilation throughout the day. Strategic window placement in key areas like the kitchens and room 1 enhances airflow and cooling. Together, these elements minimize reliance on artificial cooling, improving comfort and energy efficiency.

4.3 Temperature and Wind Velocity Analysis

Table 4.1 presents temperature and wind velocity readings for the traditional Malay house throughout the day, focusing on the main hall, room 1, the kitchen, and outdoor conditions. Morning temperatures range from 25.8°C in the main hall to 26.4°C outside, with moderate airflow of 0.5 m/s in the main hall aiding comfort, while lower wind velocities in room 1 and the kitchen (0.2 m/s) result in slightly higher temperatures. By midday, temperatures rise significantly, with the main hall reaching 28.8°C and outside temperatures peaking at 29.2°C, as wind speeds decrease to 0.3 m/s in the main hall and 0.1 m/s in the other rooms, hindering cooling. In the afternoon, temperatures peak at around 30.5°C, with very low wind velocities causing discomfort, while evening temperatures drop to more comfortable levels of 27.6°C in the main hall and bedroom and 27.8°C in the kitchen, aided by increased wind speeds.

Table 4.1: Reading at Traditional Malay House

TIME	LOCATION	TEMPERATURE	WIND VELOCITY
09.00 am	Main hall	25.8 °C	0.5 m/s
	Room 1	25.9 °C	0.2 m/s
	Kitchen	26.2 °C	0.2 m/s
	Outside temperature	26.4 °C	1.5 m/s
12.00 pm	Main hall	28.8 °C	0.3 m/s
	Bedroom	29.0 °C	0.1 m/s
	Kitchen	29.0 °C	0.1 m/s
	Outside temperature	29.2°C	0.8 m/s
03.00 pm	Main hall	30.5 °C	0.2 m/s
	Bedroom	30.7 °C	0.2 m/s
	Kitchen	30.8 °C	0.1m/s
	Outside temperature	31.0 °C	1.4 m/s
06.00 pm	Main hall	27.6 °C	0.2 m/s
	Bedroom	27.6 °C	0.2m/s
	Kitchen	27.8 °C	0.5 m/s
	Outside temperature	29.3 °C	1.2 m/s

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Overall, the data highlights how wind velocity impacts indoor temperatures, where moderate morning winds maintain comfort, low midday and afternoon velocities hinder cooling, and evening winds enhance natural ventilation. Enhancing airflow through design adjustments or mechanical aids could improve thermal comfort in traditional Malay houses during peak heat hours.

Table 4.2: Reading at Modern House

TIME	LOCATION	TEMPERATURE	WIND VELOCITY
09.00 am	Main hall	27.8°C	1.0 m/s
	Dining	27.8°C	0.7 m/s
	Dry Kitchen	28.2°C	0.5 m/s
	Wet Kitchen	28.1°C	1.1 m/s
	Room 1	27.6°C	0.3 m/s
	Outside temperature	28.2°C	2.4 m/s
12.00 pm	Main hall	29.8 °C	1.2 m/s
	Dining	29.8 °C	0.9 m/s
	Dry Kitchen	30.0°C	0.5 m/s
	Wet Kitchen	29.9°C	0.7 m/s
	Room 1	29.7°C	0.5 m/s
	Outside temperature	30.2°C	2.6 m/s
03.00 pm	Main hall	32.6°C	0.9 m/s
	Dining	32.6°C	0.4 m/s
	Dry Kitchen	32.8°C	0.2 m/s
	Wet Kitchen	32.7°C	0.5 m/s
	Room 1	32.5°C	0.4 m/s
	Outside temperature	33.1°C	1.6 m/s
06.00 pm	Main hall	28.6°C	0.9 m/s
	Dining	28.6°C	0.5 m/s
	Dry Kitchen	28.7°C	0.2 m/s
	Wet Kitchen	28.7°C	0.3 m/s
	Room 1	28.5°C	0.3 m/s
	Outside temperature	27.8°C	1.2 m/s

Table 4.2 presents temperature and wind velocity readings for a modern house throughout the day, covering the main hall, dining area, dry kitchen, wet kitchen, room 1, and outdoor conditions. In the morning, temperatures are relatively low, with the main hall and dining area at 27.8°C, and the dry kitchen at 28.2°C, while outside it's slightly higher at 28.2°C; moderate wind speeds of 1.0 m/s in the main hall enhance cooling. By midday, temperatures rise significantly to around 29.8°C indoors, while the outside temperature peaks at 30.2°C,

though the dry kitchen reaches the highest temperature due to its lowest wind speed of 0.5 m/s. Afternoon temperatures peak at 32.6°C to 32.8°C, coinciding with a drop in wind velocities, which contributes to discomfort. In the evening, temperatures decrease to 28.6°C indoors as outside temperatures fall to 27.8°C, with increased wind speeds aiding cooling. This analysis reveals that while morning winds maintain comfort, lower wind speeds during peak hours lead to higher indoor temperatures, emphasizing the need for enhanced ventilation in modern houses for improved thermal comfort.

4.4 Observation Analysis

Observations were conducted at both the Modern Semi-Detached House and the Traditional Malay House to identify additional passive cooling criteria. Key factors such as ventilation type and window size significantly influence wind direction and optimize ventilation. The type of building material also impacts passive cooling effectiveness. Consequently, these observations, along with the data findings presented above, reinforce our understanding of passive cooling strategies in these buildings.

4.5 Material Usage

The Traditional Malay House, or Rumah Kutai, exemplifies effective timber use in construction, showcasing stability and durability that reflect traditional practices and modern sustainability. Its structure features a corrugated zinc roof supported by timber beams and columns, with timber walls and floors providing excellent insulation. The extensive use of timber exceeds the Green Building Index (GBI) requirement of over 50% certified wood-based materials, emphasizing a commitment to eco-friendly practices. The design incorporates elevated floors and large windows for enhanced natural ventilation, achieving thermal comfort in Malaysia's tropical climate while supporting local economies. In contrast, fieldwork observations of a modern semi-detached house in Kota Damansara reveal that it primarily uses concrete, which, despite its durability, compromises energy efficiency and increases indoor temperatures, leading to higher cooling energy consumption. Its roof features clay tiles on a timber structure, and the walls are brick with plaster, but it fails to meet GBI requirements for certified wood-based materials, highlighting the need for future housing projects to incorporate more sustainable materials for improved energy efficiency and comfort.

CONCLUSION

This research conducted a comparative analysis of passive cooling strategies in traditional Malay houses and modern semi-detached homes in Malaysia, focusing on building orientation, ventilation rates, types of ventilation, and material usage. The study revealed that traditional Malay houses, with their strategic orientation, natural ventilation, and use of wood, offer superior temperature regulation compared to modern homes. It emphasized the effectiveness of traditional architectural techniques and identified innovative designs that

enhance thermal comfort through passive cooling. By achieving its objectives, the research offers valuable insights for integrating traditional passive cooling strategies into modern architecture, promoting sustainable housing solutions in Malaysia's tropical climate.

REFERENCES

Abdullah, H., Azhar, S. A., & Zahari, N. (2018). Thermal comfort in traditional Malay houses. Journal of Advanced Research in Applied Mechanics, 52(1), 23-30.

Al-Tammi, A. K., & Syed Fadzil, S. A. (2011). Vernacular passive design strategy in the traditional Malay houses in hot–humid climate. Energy and Buildings, 43(6), 1523-1529.

Alessandro, D., Fara, G. M., & Lamonaca, C. (2017). Experimental investigation on natural ventilation performance of historic buildings: A case study in Southern Italy. Sustainability, 9(6), 898.

Bogota, T., Kato, S., Mohd Nor, N. M., & Sawa, K. (2011). Challenges in green and sustainable building: The case of a developing country. Habitat International, 35(1), 1-10.

Brown, A., & Lee, J. (2021). Passive cooling techniques: A comprehensive review. Journal of Sustainable Architecture, 15(2), 45-59.

Chang, L., & Wang, H. (2020). Quantitative analysis of passive cooling strategies in modern homes. Sustainable Building Review, 7(4), 112-125.

Fathi, S., Zulkarnain, N. S., Zainol, N. A., & Ismail, N. H. (2015). A review on the traditional Malay house for sustainable design strategies. Procedia - Social and Behavioral Sciences, 170, 489-498. https://doi.org/10.1016/j.sbspro.2015.01.054

Garcia, M., & Martinez, L. (2023). Comparative study of passive cooling methods in traditional Malay houses and modern homes. Journal of Sustainable Development, 25(3), 78-92.

Givoni, B. (1994). Passive and low energy cooling of buildings. New York: John Wiley & Sons.

Green Building Index. (2011). Kuala Lumpur: Green Building Index Sdn Bhd.

Heiselberg, P. (2009). Natural ventilation in non-domestic buildings: Literature review. Energy and Buildings, 41(10), 1057-1067.

Hien, W. N., Poh, C. H., & Feriadi, H. (2000). Thermal comfort study of different housing designs in Malaysia. Building and Environment, 35(5), 405-410.

Ismail, Z., Said, I., Jusoff, K., & Misnan, M. S. (2019). Sustainable building features: Comparative study of Malay traditional houses and modern houses in Malaysia. Sustainability, 11(2), 310.

Johnson, S., et al. (2022). Qualitative insights into passive cooling strategies: Case studies from tropical regions. Environmental Architecture Review, 18(1), 105-120.

Johari, N. H., Yusoff, N. A., Othman, M. S., & Bakar, N. A. (2017). Adaptation and sustainability: The bamboo house in the Malay traditional architecture. IOP Conference Series: Materials Science and Engineering, 271, 012087. https://doi.org/10.1088/1757-899X/271/1/012087

Kamal, E. M., Karim, M. H. A., Said, M. A., & Baharum, M. R. (2015). A review on passive cooling techniques in traditional Malay architecture. Procedia Environmental Sciences, 30, 96-101.

Kamaruzzaman, S. N., Zawawi, E. M. A., & Hana, Y. O. (2011). The influence of climate on traditional Malay houses in Malaysia. Procedia Engineering, 20, 59-64.

Lee, C., & Ng, R. (2020). Sustainable architecture in hot and humid climates: A case study of traditional Malay houses. Journal of Environmental Design, 8(2), 34-49.

Mohamed, N. H., Baharudin, Z., & Abd. Ghani, N. A. (2019). Sustainable development through traditional Malay house: A review on green building. International Journal of Built Environment and Sustainability, 6(1), 54-61. https://doi.org/10.11113/ijbes.v6.n1.306

Nicol, F., & Humphreys, M. (2002). Adaptive thermal comfort and sustainable thermal standards for buildings. Energy and Buildings, 34(6), 563-572.

Omar, S. F. S., Yusof, N. A. M., & Mansor, A. N. (2013). Energy efficiency of Malay traditional house: A review on passive cooling technique. Procedia - Social and Behavioral Sciences, 105, 114-123. https://doi.org/10.1016/j.sbspro.2013.11.014

Sadafi, N., Bahadori, M. N., GhaffarianHoseini, A., & Dahlan, N. D. (2011). A review of passive cooling systems in traditional Malay architectural heritage houses in Malaysia. Renewable and Sustainable Energy Reviews, 15(9), 4665-4675.

Santamouris, M. (2006). Environmental design of urban buildings: An integrated approach. London: Earthscan.

Smith, T. (2023). Investigating passive cooling methods: A quantitative and qualitative approach. Journal of Sustainable Development, 27(1), 56-70.

Tan, C. K., Wong, N. H., & Wong, N. C. (2020). A review on thermal performance and passive cooling strategies of semi-detached houses in Malaysia. Energy and Buildings, 224, 110286.

Wong, N. H., Jusuf, S. K., & Syahali, S. (2019). Sustainable urban housing in hot-humid climates. Journal of Urban Ecology, 5(1), juy034.

Zr, M. A. M., & Mochtar, A. Z. (2013). Thermal comfort investigation on selected traditional houses in Malaysia. Procedia-Social and Behavioral Sciences, 85, 355-364.

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THE ARCHITECTURE OF THE LUWU PALACE AS A REFLECTION OF BUGIS HISTORY AND CULTURE

Andi Yusdy Dwiasta[1], Karta Jayadi [2], Andi Abidah[3*]
[1,3]*Architecture Study Program State University of Makassar, Indonesia*
[2]*Art and Design Study Program, State University of Makassar, Indonesia*

[*]*Corresponding Author: e-mail: andi.abidah@unm.ac.id*

Abstract: The Luwu Langkanae Palace is a form of traditional Bugis architecture that reflects the cosmology, social structure, and cultural values of the Luwu community. This research examines the architectural elements of the Luwu Langkanae Palace with a focus on its symbolism. The spatial arrangement of the palace, which includes the division between the main space (ale bola), the kolong (lower space), and additional rooms, illustrates the social organization and ritual functions of the community. The towering roof and symbolic ornaments emphasize the connection between the physical and spiritual aspects of the building's design, reflecting the cosmological views of the Luwu people. The history of the palace as a center of power and culture since the 12th century, along with efforts for maintenance and renovation, highlights the significance of the palace in the context of cultural heritage and local identity. In conclusion, the Luwu Langkanae Palace is a manifestation of deep cosmological and social values, serving as a symbol of cultural heritage and a center for the preservation of Bugis history.

Keywords: Luwu Langkanae Palace, Traditional Bugis Architecture, Luwu Cosmology, Social Structure, Cultural Values, Spatial Arrangement, Architectural Symbolism

INTRODUCTION

The Luwu Kingdom is one of the oldest and most significant kingdoms in the Sulawesi archipelago, governed by a king or queen with the title Pajung. The Luwu Palace, known as Langkanae, serves as a historical heritage site for the Luwu community. The term "Langkanae" translates to "the high place," symbolising the centre of power and governance of the Luwu Kingdom. The current centre of the Luwu Kingdom is located in the city of Palopo, having

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previously been situated in Malangke before relocating to its present site. The architecture of Langkanae resembles that of traditional Bugis houses but possesses distinct characteristics, notably its soaring roof, which signifies that the residence is occupied by individuals of high social status and power. The main structure of the house is proportionately tall, harmonising with the height of the roof, while the legs of the house or its columns maintain a proportional relationship between the roof, body, and legs of the house.

The Langkanae Palace has witnessed significant events throughout the history of the Luwu Kingdom, from its establishment and period of glory to the arrival of Islam and the subsequent colonial incursion into the Luwu territory. During the Dutch colonial era, to undermine the Luwu Kingdom, the Dutch authorities demolished the Langkanae Palace, which was a key symbol of the Luwu Kingdom's identity, replacing it with a structure made of stone, see figure 1.



Figure 1: Kingdom luwu palace built by Colonial

Currently, the Langkanae Palace serves as a center for research activities related to customs and culture, history, and architecture, as well as a tourist attraction in South Sulawesi, particularly in the city of Palopo. Considering this, it is imperative that Langkanae be preserved and maintained as a testament to history in the modern era.

RESEARCH METHODOLOGY

This research employs a qualitative approach aimed at exploring and analysing the architecture of the Luwu Palace (Langkanae) within the context of Bugis history and culture. The methods utilised in this study include data collection through literature review, field observation, in-depth interviews, and qualitative data analysis. The following steps will be taken in this research:

LITERATURE REVIEW

The first step in this research involves conducting an extensive literature review. The literature to be examined includes:

i. Books and scholarly articles on Bugis history and culture, particularly pertaining to the Luwu Kingdom.
ii. Studies on traditional Bugis architecture, including the design of traditional houses and other palaces in South Sulawesi.
iii. Historical documents and colonial records related to the development of the Luwu Kingdom.

3.1 Field Observation

This research will involve direct observation of the Langkanae Palace in Palopo, South Sulawesi. The objectives of this observation are to:

i. Document the form, structure, and spatial arrangement of the palace.
ii. Identify distinctive architectural elements and ornaments.
iii. Understand the surrounding environmental context and how the palace integrates with the local community.

3.2 Interviews

Interviews will be conducted with several key informants who possess in-depth knowledge about the Langkanae Palace and Bugis culture, including:

i. Local community leaders and Bugis cultural experts.
ii. Members of the Luwu royal family.
iii. Architects or academics who specialise in traditional South Sulawesi architecture. These interviews aim to gain insights into the symbolic meanings of the palace's architecture, the changes that have occurred over time, and the role of the palace in the social and cultural life of the Luwu community.

3.3 Data Analysis

The data collected from the literature review, field observation, and interviews will be analysed qualitatively:

i. Coding the data to identify key themes that emerge.
ii. Interpreting the data within the contexts of Bugis history, culture, and architecture.
iii. Connecting findings with relevant architectural and anthropological theories.

3.4 Data Validation

To ensure the validity of the data, the research will employ triangulation techniques, comparing results from various data sources (literature, observation, and interviews)

RESULT OF RESEARCH

The Luwu Kingdom is the oldest kingdom in the Bugis land, with its territory extending as far as Southeast Sulawesi. A map of the Luwu Kingdom's region can be viewed, see figure 2.

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Kingdom of Luwu History[1]	
Batara Lattu	Batara Lattu ruled for 20 years and is estimated to have reigned around the year 948 AD
Batara Guru (the year 900s)	According to *I La Galigo*, the Luwu Kingdom was once ruled by a king named Batara Guru. *I La Galigo* further explains that the Luwu Kingdom existed during the era of the Srivijaya Empire
Isumpurusiang (the year 1268)	According to the *Nagarakretagama*, written by Prapanca in 1364 during the era of Gajah Mada, the Luwu Kingdom was noted in the year 1268. At that time, the king of Luwu was Simpurusiang (the third king of Luwu).
The 14th century	From 1495 to 1520 (Dewa Raja), the kingdom held significant power on the southwest and southeast peninsulas,
	Conducting military campaigns against neighboring kingdoms, Wajo and Sidenreng.
The 16th century	On the 4th or 5th of February, 1605, Datu Luwu, La Patiwareq Daeng Pareqbung, became the first ruler from the southern region of Sulawesi to embrace Islam
	The king changed his name and adopted the title Sultan Muhammad Wali Mu'z'hir (or Muzahir) al-Din
	The power of Luwu began to wane in the 16th century due to the rising strength of agrarian kingdoms from the south, and its military defeats are documented in the *Tawarik Bone*
	In 1620, the Luwu Kingdom relocated its capital from Malangke to a new capital, Palopo. At that time, the population of Malangke was approximately 15,000 people
The 19th century	James Brooke noted that in the 1830s, Luwu was the oldest Bugis kingdom
The 20th Century	In 1905, the Dutch landed in the Luwu region
	In 1920, the Dutch constructed Langkanae using stone materials after burning the original wooden structure. It now serves as a museum
	The burning of Langkanae by the Dutch symbolised that the Luwu Kingdom was now under Dutch administration

	The governance system of Luwu is divided into two levels of administration: 1. **High-level governance** is directly held by the Dutch authorities. 2. **Low-level governance** is managed by the Swapraja.
	The territory of the Luwu Kingdom was subsequently divided at the discretion and for the benefit of the Dutch into two *Afdelingen* and one district: 1. **Poso** was separated and established as an *Afdeling*. 2. **Pitumpanua** was designated as a district and incorporated into the jurisdiction of Wajo. 3. **Luwu** was also established as an *Afdeling* with its administrative seat in Palopo
	Subsequently, the Luwu *Afdeling* was divided into five *Onder Afdelingen,* namely: 1. *Onder Afdeling Palopo*, with its capital in Palopo. 2. *Onder Afdeling Makale*, with its capital in Makale. 3. *Onder Afdeling Masamba*, with its capital in Masamba. 4. *Onder Afdeling Malili*, with its capital in Malili. 5. *Onder Afdeling Mekongga*, with its capital in Kolaka.
[1] hsasil wawancara dengan Opu Cenning saudara Raja Luwu saat ini dan Maddika Bua Bulan February 2024	

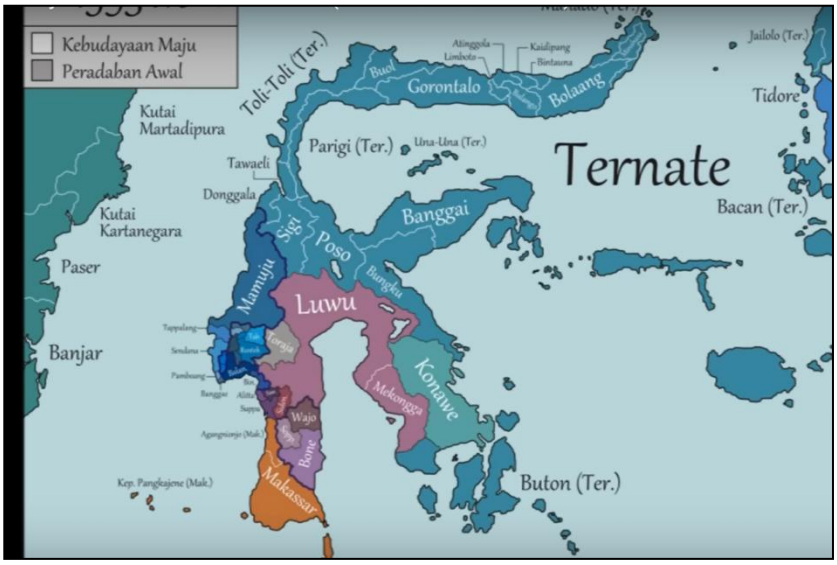


Figure 2: Map Kingdom of Luwu Area in year 1600

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Langkanae today serves as a replica of the original Langkanae that was destroyed during the colonial period. This new Langkanae was constructed based on the design of the original structure that was burned by the Dutch. The design of Langkanae resembles traditional houses in Southeast Asia, characterized by a stilt house structure. The data presented in the results of this research will consist solely of photographs and will not provide a detailed layout of the spaces, as some areas are not accessible to visitors.



Figure 3: Facade of Langkanae

Photograph: Andi Abidah (2024)



Figure 4: Modul of Main House

Photograph:Andi Abidah (2024)

DISCUSSION

5.1 History of the kingdom of luwu

As one of the major centers of power in Sulawesi, the Kingdom of Luwu exerted significant political, economic, and cultural influence, particularly through its control of trade routes in Bone Bay. The kingdom is also recognised as a center for the dissemination of Bugis religion and culture (Pelras, 1996). Langkanae, as the royal palace, serves as an important symbol reflecting the grandeur and magnificence of the Kingdom of Luwu.

During its peak, the Kingdom of Luwu played a crucial role in uniting various ethnic groups within Sulawesi and establishing diplomatic relations with other kingdoms in the archipelago. However, the influence of the kingdom began to decline with the advent of Dutch colonial power in the 19th century (Andaya, 1981). Nevertheless, the Kingdom of Luwu has endured as a political and cultural entity into the modern era. The royal family continues to uphold the existence of the Kingdom of Luwu, with a recognised king still in place today, alongside the enduring traditions and culture of the Luwu people.

5.2 Arsitektur Langkanae

Langkanae, or the Palace of Luwu, is a traditional building that reflects the distinctive Bugis architecture, featuring several unique elements and ornaments. The design of Langkanae adheres to the principles of traditional Bugis house architecture but is characterized by larger dimensions due to its function as a royal palace.

The current Istana Luwu (Langkanae) is a replica constructed to preserve and revive the architectural heritage and cultural legacy of the Kingdom of Luwu. It was reconstructed by the government and the Luwu community during the reign of Datu Bau Alamsyah as an effort to safeguard the lost cultural heritage. This replica was established in the city of Palopo as a symbol of the restoration and preservation of the architectural traditions of the Kingdom of Luwu. The construction of Langkanae coincided with the palace built during the Dutch colonial period around the year 1920. Langkanae serves not only as an architectural replica but also as a cultural representation that reinforces local identity and continues the historical legacy that once existed. Previously, Langkanae was burned by the Dutch colonial authorities as a symbol of their domination over the Kingdom of Luwu.

5.3 Roof

The roof of Langkanae is designed in a saddle shape with a pitch of 60°, differing from the typical Bugis roofs, which usually feature a gable roof with a pitch of less than 45° (Pelras, 1996). The high design of the Langkanae roof aims to evoke a sense of grandeur and authority. In this structure, the roof serves not only as an architectural element but also as a symbol of social status; the higher the roof, the higher the social standing of its owner.

5.4 Main Body of the House

The main body of Istana Langkanae comprises five modules in the primary building and two additional modules in the tamping, connected harmoniously (Pelras, 1996). Each module is designed with windows that serve as sources of light and ventilation and as aesthetic and symbolic elements within traditional Bugis architecture. These windows are typically symmetrically placed in each module, reflecting the principles of balance and order that characterise Bugis house design.

The positioning of windows in each module enhances air circulation and natural lighting within the house, creating a comfortable and healthy environment for the occupants. Furthermore, the presence of windows in each module facilitates interaction between the interior and exterior spaces, while also offering views of the surrounding environment. This design reinforces the connection between the house and nature, aligning with the principles of sustainability inherent in Bugis architectural culture.

5.5 *Kolong* of house

The main structure of Langkanae is supported by large wooden pillars, which are characteristic of Bugis architecture. Langkanae features a kolong, which is the elevated lower part of the building that is spacious and serves various purposes, such as social activities and open space for receiving guests or conducting traditional meetings. The presence of the kolong also

reflects the Bugis cosmological concept, wherein the lower part of the house symbolizes the underworld or the supernatural realm

The structure and materials of Langkanae are constructed from ironwood, known for its strength and durability against tropical weather. This ironwood is commonly used in the construction of significant buildings in South Sulawesi due to its high resistance to both insects and weather changes, making it an ideal material for long-lasting structures.

Waterson (1997), in her study of traditional architecture in Southeast Asia, emphasizes that traditional houses in the region are not merely residences but also reflections of the local cosmology, social structure, and culture. Waterson further argues that Southeast Asian traditional architecture is designed with a profound consideration of the relationship between humans and the universe. Architectural elements such as roof shapes, room layouts, and the use of local materials reflect the worldview of the community. The soaring roofs symbolize a connection to the spiritual dimension, while the spatial separation between social and private areas of the house reflects social hierarchy and social functions.

Additionally, Waterson (1997) points out that traditional Southeast Asian architecture is highly adaptive to the environment and practical needs of the community. These houses are often constructed with locally available materials, such as bamboo, wood, or stone, which not only accommodate the tropical climate but also showcase local construction expertise. Traditional construction techniques, such as nail-less wooden joints, along with designs that allow for good air circulation, reflect the community's efforts to create a comfortable and sustainable environment. Through this approach, Waterson highlights how traditional Southeast Asian architecture is the result of the interaction between cultural values, cosmology, and practical adaptations to environmental conditions.

Rapoport (1969) explains how the form of houses and the structure of traditional architecture reflect various aspects of social and cultural life. He further elaborates that traditional houses are often designed based on principles related to social hierarchy, gender roles, and family relationships. The structure of the house, the layout of rooms, and the use of materials all reflect how communities understand and organize their lives. The division of space within the house often mirrors social hierarchies and ritual functions, while designs adapted to the local climate demonstrate responses to environmental conditions.

Rapoport (1969) also underscores that traditional architecture follows age-old patterns passed down through generations, reflecting cultural stability and historical continuity. Traditional architecture is not merely about function and aesthetics; it also serves as a medium for conveying and preserving cultural values and the social structure of the community.

Oliver (1997) outlines that Bugis houses are a prime example of vernacular architecture that illustrates the interconnectedness of culture, cosmology, and the environment. Oliver further explains that Bugis houses are designed with cosmological principles in mind, encompassing the spiritual relationship between humans and nature. The high roofs and stilt structures of

Bugis houses not only protect against environmental elements, such as floods and pests, but also symbolize the spiritual and cosmological aspirations of the Bugis people.

The design of Bugis houses reflects the social and cultural needs of the community. The division of space within a Bugis house—including the *kolong* (underfloor space), *lontang* (main space), and various room modules—demonstrates how these areas are crafted to fulfill different social functions and mirror social hierarchies. The use of local materials such as ironwood and traditional nail-less construction techniques, commonly found in Bugis houses, also showcases adaptation to tropical climate conditions and sustainability in design. Through Oliver's perspective, Bugis houses are understood as manifestations of the interaction between practical needs, cultural values, and the cosmology of the Bugis community.

Furthermore, Abidah (2017) elaborates on the relationship between Bugis house architecture and the cosmology and social structure of its community. The design of Bugis houses reflects local cultural values through symbolic spatial divisions, such as the *kolong* (lower space) symbolizing the underworld, and the lontang (main space) serving as the centre of social and ritual life. Additionally, the use of local materials and traditional construction techniques, including nail-less wooden joints, signifies adaptation to climatic conditions and sustainability. Bugis houses are not merely physical structures but profound representations of cosmology and social structure, embodying the cultural values and spiritual connections of the Bugis people.

5.6 Space Division

The space of Bugis houses is divided into two concepts: vertical and horizontal. Vertically, Bugis houses are divided into three main sections: the ettic, the body of the house, and the underfloor space *(kolong).* Horizontally, Bugis houses are also segmented into three areas: *lego-lego* (veranda), the main house, and the kitchen. Specifically, within the main house, the space is further divided into three sections: *lontang isaliweng, lontang ritangnga*, and *lontang rilaleng*.

Each section of the *lontang* serves a distinct purpose. The *lontang isaliweng* is designated for guests, family gatherings, and is a space reserved for adult males. The *lontang ritangnga* serves as a private area for the head of the household, his wife, and sons under the age of seven. Meanwhile, the *lontang rilaleng* is intended for daughters and elderly individuals (Abidah, 2016). In the Langkanae Palace, the spatial structure consists of *lontang isaliweng, lontang ritangnga,* and *lontang rilaleng*. However, there is a difference in the function of the *lontang ritangnga* in Langkanae, as it is specifically reserved for the king and his queen, rather than for sons under the age of seven, as is typical in conventional Bugis houses.

The *ale bola* represents the core of the Langkanae Palace, functioning as the main space and the centre for social and ritual activities. In the context of Bugis social structure, this area is used for important meetings, customary ceremonies, and receiving distinguished guests. This spatial division reflects social hierarchies and different social functions. The *kolong* area serves as a space for everyday social activities and possesses symbolic significance, representing a

connection to the underworld or the spiritual realm. This space bridges the practical aspects of daily life with the spiritual and cosmological dimensions of the Luwu community.

5.7 Layout And Spatial Organisation and Symbolism

The spatial layout of the Luwu Langkanae Palace is designed based on principles of balance and order, reflecting the cosmology of the Luwu community. The systematic division of space between social and private areas embodies the harmony between daily life and the spiritual aspects of Bugis-Makassar society. This indicates that these spaces serve physical functions and possess symbolic meanings that connect humans with the universe and their spiritual values.

The towering roof of the Luwu Langkanae Palace serves not only practical purposes, such as protection from the elements, but also carries profound symbolic meanings (Mattulada, 1995)The high roof represents a connection to the heavens and divine power, signifying that the palace is a place imbued with spiritual significance. According to Pelras (1996), in traditional Bugis-Makassar architecture, the soaring roof shape is regarded as a symbol of closeness to the upper world or spiritual realm, reinforcing the role of the palace as a nexus connecting humanity with higher powers.

The carvings and ornaments on the roof and facade of the Luwu Langkanae Palace carry symbolic meanings closely tied to local myths, legends, and beliefs (Pelras, 1996). Motifs such as the young bamboo shoots, square *lawasuji* patterns, and *goncing sikoi* do not merely function as decorative elements; they also convey the cultural and spiritual values of the Luwu people. According to Mattulada (1985), the ornaments in Bugis-Makassar architecture reflect the cosmological views and philosophies of the community, linking the building to its identity and ancestral values.

Furthermore, Reid (1997) states that in many communities in Sulawesi, carvings on important buildings such as palaces or traditional houses serve dual functions: they signify social status and communicate cultural values. These carvings symbolism respect for nature and the spiritual forces that protect the community while reinforcing the building's role as a center for social and spiritual life.

The use of ironwood and other local materials in the Luwu Langkanae Palace not only reflects adaptation to environmental conditions but also carries deep symbolic value (Pelras, 1996). The choice of these materials is based on their strength and durability, allowing the building to withstand the test of time, particularly in the tropical climate of Sulawesi. Additionally, materials like ironwood are believed to absorb and reflect positive energy, aligning with the cosmological principles of the Luwu community that prioritise harmony between humans, nature, and spiritual forces (Mattulada, 1985).

According to Reid (1997) the use of local materials in traditional architecture also serves to strengthen cultural ties to the surrounding environment, creating spaces that are not only functional but also spiritual. The carefully chosen building materials are considered capable

of connecting the dwelling to the universe, reinforcing the cultural and spiritual values of the local community. The integration of practical and symbolic functions in the spatial organisation of the Luwu Langkanae Palace demonstrates that architectural design not only meets functional needs but also reflects the cosmological and cultural values of the Luwu community (Pelras, 1996). The main space (ale bola), as the centre for social and ritual activities, underscores the importance of social and spiritual dimensions in Luwu community life.

The architectural aesthetics involving symbolic elements, such as ornaments and roof shapes, serve to strengthen the connection between the physical and spiritual aspects of the building. This reinforces the idea that the Luwu Langkanae Palace is a manifestation of the broader worldview of the Luwu community (Mattulada, 1995). According to (Reid, 1997), good architecture must integrate practical functions with symbolic values, thereby creating spaces that are not only functional but also rich in meaning.

Furthermore, (Karnelia, 2022) argues that traditional architectural design often reflects the relationship between humans and their environment, where every element within the building is designed with cultural and social context in mind. Thus, the Luwu Langkanae Palace is not merely a structure but a space that encapsulates the history, culture, and identity of the Luwu community.

CONCLUSION

The Luwu Langkanae Palace serves as a significant representation of the architecture and culture of the Luwu kingdom, reflecting not only its rich historical legacy but also integrating the cosmological and social values of the Bugis people. The spatial organisation of the Luwu Langkanae Palace, with its clear divisions between the main area, kolong, and additional spaces, illustrates the complex social structure and ritual functions inherent in the community. The towering roof and symbolic ornaments of this building emphasise the relationship between the physical and spiritual aspects, embodying the profound cosmological worldview of the Luwu society.

Historically, this palace has functioned as the centre of power, culture, and administration for the Luwu kingdom, playing a crucial role in political and social activities since the 12th century. The architectural changes that have occurred over time demonstrate the adaptability to cultural influences and the efforts made to preserve the cultural heritage. To this day, the Luwu Langkanae Palace remains a symbol of local identity and a centre for historical preservation, offering valuable insights into the lives and values of the Bugis community. As a historical monument, this palace continues to serve as an object of research and education, reinforcing the understanding and appreciation of the cultural heritage of the Luwu kingdom.

REFERENCES

Abidah, A. (2016). Applying Uneven Number (Te'gennebali) of Certain Elements in Bola Ugi District of Soppeng South Sulawesi, Indonesia. *Procedia Engineering*, *161*, 810–817.

https://doi.org/10.1016/j.proeng.2016.08.717

Abidah, A. (2017). Survival Old Model Tamping on Bugis House in Kampong of Bunne Regency of Soppeng South Sulawesi Indonesia. *IOP Conference Series: Materials Science and Engineering*, *245*(4). https://doi.org/10.1088/1757-899X/245/4/042076

Andaya, L. Y. (1981). *The Heritage of Arung Palakka*. Springer-Scince and Bisnis Media BV.

Karnelia, T. (2022). *Estetika Bentuk Arsitektural Rumah Adat (Saoraja) Langkanae Di Palopo*. Hasanuddin University.

Lain, S., Orang, K., Bugis, E., Mattulada, D., Syahdan, P., Bugis, M., Pusat, G., Penelitian, K., Hasanuddin, U., Fakultas, A., Sosial, I., & Politik, I. (n.d.). *Sisi lain karakter orang bugis **. 1–7.

Mattulada. (1995). *Latoa: Suatu Lukisan Analitis Terhadap Antropologi Politik Orang Bugis*. Univeritas Hasanuddin.

Oliver, P. (Ed.). (1997). Theories and Principles. In *Encyclopedia of Vernacular Architecture of the World* (pp. 6–15). Cambridge University Press.

Pelras, C. (1996). *The Bugis*. Oxford University Press Pte Ltd.

Rapoport, A. (1969). House form and culture / Amos Rapoport. *House Form and Culture / Amos Rapoport*, *1969*(1969), 1–99. https://doi.org/1969

Reid, A. (1997). Southeast Asia in the early modern era: Trade, power, and belief. *The Journal of Asian Studies; Pittsburgh*, *56*.

Waterson, R. (1997). *The Living House an Anthropology of Architecture in South-East Asia*. Oxford University Press Pte Ltd

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TRANSFORMATION OF TRADITIONAL BUGIS ARCHITECTURE : *A CASE STUDY OF SAORAJA SENG IN SOPPENG REGENCY, INDONESIA*

Andi Abidah[1*], Karta Jayadi[2], & Andi Yusdy Dwiasta[3]

[1,3]Affiliation: Architecture Study Program, State university of Makassar,2 Design and Art Study Program State University Of Makassar. Campus II Parangtambung Daeng Tata Street, Makassar South Sulawesi Indonesia

*Corresponding Author: andi.abidah@unm.ac.id **

Abstract: This study investigates the transformation of traditional Bugis architecture, focusing on Saoraja Seng in Soppeng Regency as a case study. *Saoraja Seng* exemplifies the evolution of Bugis architectural practices in response to colonial influences and modern needs. This research examines the adaptation of traditional design elements, including the hip roof, the use of Malay-style windows, and symbolic ornaments such as *pucuk rebung* and *lawasoji* quadrilaterals. Through an analysis of architectural changes and their cultural implications, the study reveals how *Saoraja Seng* integrates traditional Bugis aesthetics with colonial architectural influences while preserving cultural and symbolic values. The study employs theoretical frameworks from Claude Lévi-Strauss's structuralism and Paul Oliver's vernacular architecture principles to understand how these adaptations reflect shifts in social and cultural contexts. The findings highlight the dynamic nature of architectural traditions and the ongoing negotiation between heritage and modernity in Bugis architecture.

***Keywords*:** symbolism, transformation, Saoraja Seng, Bugis architecture

INTRODUCTION

Traditional Bugis architecture is a significant cultural heritage characterised by its historical value and symbolic meaning in South Sulawesi. The Saoraja, a type of Bugis traditional house, serves not only as a dwelling but also as an indicator of social status and ethnic identity within

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the Bugis community. In Soppeng Regency, the Saoraja Seng represents an interesting case of architectural transformation, displaying a distinct departure from other traditional Bugis house forms. The Saoraja Seng diverges from traditional Saoraja due to the architectural influences introduced during the Dutch colonial period. This transformation is apparent in various aspects of the building, including its exterior design and spatial layout. These modifications illustrate the interaction between local Bugis culture and external influences, particularly colonial, which significantly impacted traditional architecture in the region.

This study aims to analyse the transformation of traditional Bugis architecture through a case study of Saoraja Seng in Soppeng Regency. By investigating changes in architectural form, the research seeks to elucidate how historical social, cultural, and political dynamics have influenced the evolution of Bugis architecture. This analysis is also essential for understanding how this architectural heritage can be preserved amidst the challenges of modernization and evolving societal conditions.

RESEARCH METHODOLOGY

This section outlines the approach and techniques employed in studying the transformation of traditional Bugis architecture, focusing on the Saoraja Seng in Soppeng Regency. The methodology encompasses the following components:

1. Literature Review: A comprehensive review of existing literature on Bugis architecture, colonial influences, and architectural transformation. This includes historical texts, academic articles, and previous studies relevant to the topic.

2. Field Research: On-site observation and documentation of Saoraja Seng. The procedure involves detailed architectural surveys, photographic documentation, design elements and analysis of spatial configurations.

3. Interviews: Conduct interviews with local experts, architects, and members of the Bugis community to gather qualitative data on the historical and cultural significance of Saoraja Seng and its transformation.

4. Comparative Analysis: Comparing Saoraja Seng with other traditional Bugis houses to identify distinctive features and transformations. This comparison helps to contextualize the unique aspects of Saoraja Seng within the broader spectrum of Bugis architecture.

5. Historical Analysis: Examining historical records and colonial documents to understand the impact of Dutch colonialism on architectural practices and how these influences are reflected in Saoraja Seng.

6. Preservation Assessment: Evaluating the current state of Saoraja Seng and assessing strategies for its preservation amidst modernization pressures.

This methodology ensures a comprehensive analysis of the architectural transformation and provides insights into the broader implications for preserving traditional Bugis architecture.

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RESULT OF RESEARCH

Saoraja Seng is situated in Galung Village, Liliriaja District, Soppeng Regency. It is a residence belonging to a noble with a familial connection to the Raja of the Pattojo kingdom, specifically being the sibling of King of Pattojo XII. This house, owned by Datu Pallawarukka, was constructed during the Dutch colonial period. As a noble residence, Saoraja Seng functions not only as a dwelling but also as a symbol of status and authority within the Bugis society of that time.

Constructed during the Dutch colonial period, Saoraja Seng reflects significant architectural changes, integrating local design elements with colonial influences. The construction of this house illustrates the adaptation to European influences introduced by Dutch colonization and reflects the shifts in the social and political structure of Soppeng society at that time. As a result, Saoraja Seng functions not only as a noble residence but also as a marker of social and cultural change within the colonial context.

Pict. 1. Position of *tamping* in the front of main house



Photographer : Andi Abidah 2015

Pict. 2. View of Saoraja Pattojo



Photographer : Andi Abidah 2015

Pict. 3. The roof of Saoraja Seng

Photographer : Andi Abidah 2015

pict. 4. View of Saoraja Pattojo

Photographer : Andi Abidah 2015



Pict. 5. Interior of Saoraja Seng

Photographer : Andi Abidah 2015



Pict. 6. Interior Saoraja Seng

Photographer : Andi Abidah 2015

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Pict. 7. Different level between main house and *tamping.*

Photographer : Andi Abidah 2015



Pict. 8. Stairs use *parinawang*

Photographer : Andi Abidah 2015



Pict. 9. Applying *parenreng* flower Ornamet

Photographer : Andi Abidah 2015



Pict.10. Blooming flower in the end of roof construction. Photographer : Andi Abidah 2015



Pict.10 Anjong like crown

Photographer : Andi Abidah 2015



Pict.11. Applying ornamentasi in the end of roof

Photographer : Andi Abidah 2015

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Pict 12. The roof did not apply sadle roof
Photographer : Andi Abidah 2015



Pict.13. Full Ornament in the end roof
Photographer : Andi Abidah 2015

Interviews with the descendants of the house's owner, specifically Andi Dhamra, 53 years old and a direct grandson, revealed that the house originally did not have ornaments on the roof's edge. These were added after receiving support from the Soppeng Regency government. Another interview with Andi Murni, 85 years old, explained that the house's form has not changed since its construction. The corrugated iron material on the roof's covering has been used since the beginning. The only modification was the staircase material, which was originally made of bamboo; however, the design remains the same, featuring a railing and a partition on the stairs.

Based on an interview with Andi Sulaiman, a descendant of the Pattojo kingdom, it was revealed that during the Dutch colonial period, nobility was prohibited from displaying opulence through their residences. This regulation was likely implemented as a strategy to mitigate the potential for rebellion or dissent by controlling the social status and public image of the aristocracy. This policy exemplifies the colonial influence in shaping local social and cultural life, including architectural practices, where expressions of wealth and status had to be subdued or adapted to conform to colonial norms.

DISCUSSION

4.1 Form of house

The form of Saoraja Seng in Soppeng Regency, constructed during the Dutch colonial period, represents a fascinating transformation of traditional Bugis architecture. This change reflects colonial influence and the social, cultural, and political dynamics that unfolded during the colonial era. To fully understand the transformation of Saoraja Seng, it is essential to discuss it within the context of relevant architectural theories and cultural studies.

Acculturation is the process by which two or more cultures interact and influence each other, resulting in the emergence of a new cultural form. In the context of Saoraja Seng, architectural acculturation occurred when European design elements were introduced into traditional Bugis architecture. According to the theory of architectural acculturation, as discussed by (Oliver, 1997a)**,** changes in traditional architecture often occur in response to contact with dominant external cultures. These changes may involve alterations in building forms, materials, or construction techniques. In the case of Saoraja Seng, colonial influence is evident

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in the transformation of the roof from a traditional gable to a flat roof, which is more common in European architecture, as well as in the use of building materials such as brick and cement. Architecture is not merely about physical form but also social and symbolic representation. Saoraja Seng, as a noble residence associated with the Pattojo kingdom, carries deep symbolic meaning. The theory of architectural representation, as explained by (Rapoport, 1969) emphasizes that the form of a house and the structure of buildings often reflect social status, cultural identity, and political power. In this context, the transformation of Saoraja Seng can be seen as an effort to preserve the symbolic status of Bugis nobility amid colonial influence. The incorporation of colonial architectural elements can be interpreted as a representation of the Bugis nobility's adaptation and adjustment to the dominant political and cultural forces of the time.

Modernization, particularly in a colonial context, involves not only adopting of new technologies and materials but also changing how societies perceive their identity and traditions. In the case of Saoraja Seng, modernization is evident in the adoption of more durable construction techniques and modern materials. However, this does not erase the traditional Bugis identity; instead, it creates an architectural hybrid that blends traditional elements with modern influences.

4.2 Façade

The roof of Saoraja Seng, which utilizes a hipped roof instead of the traditional Bugis gable roof, reflects the integration of traditional architecture with external influences, particularly colonial ones. According to the theory of architectural acculturation, as explained by (Oliver, 1997a), acculturation occurs when design elements from different cultures are adopted and adapted into local architecture. In the case of Saoraja Seng, adopting the hipped roof from European architectural traditions illustrates how colonial design was adapted to local conditions, both in terms of aesthetics and functionality.



Pict.14. Transformation of roof form in teh saoraja seng. Follow of Europe roof
Photographer : Andi Abidah 2015

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Furthermore, the addition of ventilation between the main structure and the roof can be analysed through the lens of tropical architecture theory, which underscores the importance of adapting design to the local climate. This theory posits that effective ventilation is essential for maintaining thermal comfort within buildings, particularly in hot and humid tropical environments. A roof with integrated ventilation mitigates heat accumulation inside the building, enhances air circulation, and improves occupant comfort. In this regard, the architectural transformation of Saoraja Seng not only reflects cultural acculturation but also represents an adaptive response to local climatic and environmental conditions, highlighting both flexibility and innovation in traditional architectural practices.



Pict. 15. The view of Saoraja pattojo
Photographer : Andi Abidah 2015

In the Saoraja Seng's main structure, each building module is equipped with windows that provide natural light and essential ventilation for the tropical climate. Additionally, one module features a primary door serving as the main entrance to the house. The strategic placement of these windows and doors can be analysed through Rapoport (1979), which explores how architectural forms and layouts are shaped by environmental context, climate, and local cultural norms. Rapoport (1979) asserts that architectural elements such as windows and doors fulfil both functional and symbolic roles, reflecting how societies adapt to their physical and social environments. In the context of Saoraja Seng, the design and placement of these elements illustrate the building's adaptation to the tropical climate of South Sulawesi while also embodying Bugis cultural values that emphasize openness and engagement with the surrounding environment.

The incorporation of Sulawesi Malay-style windows into Saoraja Seng can be examined through the Gordon Jr. (1996) framework that argued that cultural and architectural elements are integral to deeper social structures, with each element imbued with symbolic meaning and function within a complex system. In this context, the Sulawesi Malay-style windows are not merely decorative or functional; they signify the cultural interaction between the Bugis and external influences, such as Malay traditions. Lévi-Strauss's explained that the inclusion of the Sulawesi Malay-style windows in Saoraja Seng exemplifies a process of acculturation,

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where external influences are woven into the local cultural fabric without displacing its original identity. This reflects the ability of the Bugis people to integrate new elements into their traditions, thereby creating new meanings and values that enhance and further expand their cultural identity.

In traditional Bugis architecture, as exemplified by Saoraja Seng, the selection of three window modules and one module for human circulation is not merely an aesthetic choice but is deeply rooted in the Bugis cultural and belief systemthat signify odd numbers. This tradition underscores that the homeowners maintain a strong connection to their cultural values and beliefs that were passed down by their ancestors through generations. Andi Abidah (2016) elaborates that odd numbers are believed to bring balance and spiritual protection within Bugis belief systems. The application of odd numbers in architectural elements is not merely ornamental but serves as a means to maintain harmony and protect the household from threats or negative energies.

Claude Levi Strauss(1963) introduced the concept of structuralism, which posits that cultural element, including architecture, function as part of a sign system reflecting deeper social norms and beliefs. In this context, the use of odd numbers in Saoraja Seng reflects the Bugis cosmological view of balance and harmony in the universe. Lévi-Strauss argues that the symbolism of numbers in architectural design mirrors the underlying social structures, thus the presence of three window modules and one circulation module in Saoraja Seng reinforces these beliefs. This demonstrates that architecture is not merely a physical space but also a medium for symbolic expression and cultural identity.

Rapoport(1969) highlighted that traditional house forms are deeply influenced by the cultural beliefs and values of the society. Paul Oliver(1997a) also underscores the importance of understanding cultural and spiritual contexts in vernacular architectural design. Meanwhile Pelras(1996) accentuated that the use of odd numbers in various aspects of Bugis life, including architecture, is part of a broader belief system connecting them to their worldview and cosmology. Thus, the structure of Saoraja Seng not only fulfils functional needs but also manifests profound cultural beliefs, with each architectural element contributing to maintaining balance and harmony in the daily life of the Bugis community.

In Bugis culture, the traditional house is analogised as a human body, with each part of the house holding deep symbolic meaning. The roof of the house, likened to the "head," represents thought and honour, while the central part of the house, or *ale bola*, is compared to the "body," serving as the centre of daily activities and life. The lower part of the house, or *kolong*, is seen as the "feet," playing a crucial role as the structural support and functional space. In Bugis houses, including Saoraja Seng, the *kolong* is not merely an empty space but serves as a public area where families can gather or hold traditional ceremonies. Access from the *kolong* to the *ale bola* is provided by stairs, bridging the two distinct realms: the open social space below and the more exclusive private area above.

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The analogy of the house as a human body can be examined through Claude Lévi-Strauss's structuralism theory, which views architectural elements as part of a system of signs and meanings within a culture. According to Lévi-Strauss, the physical structure of a building reflects the social structure and cultural values of its creators. In this context, the division of the Bugis house into "head," "body," and "feet" not only indicates practical functions but also embodies deep cultural symbolism related to Bugis social hierarchy and cosmology. Furthermore, Amos Rapoport's theory of vernacular architecture highlights that the form and function of spaces in traditional houses are significantly influenced by the local environment, climate, and social structure. The *kolong* as a public space reflects the Bugis community's adaptation to the warm tropical environment, while also underscoring the importance of communal spaces in their social structure. The stairs connecting the *kolong* with the *ale bola* emphasize the relationship between the public and private realms within Bugis houses, illustrating how traditional architecture organises social interactions in accordance with local norms and cultural values.

4.3 Elements

In Saoraja Seng, the elements of the roof, windows, and stairs play crucial roles both functionally and symbolically. The roof features a hip design, differing from the traditional Bugis gable roof, reflecting an architectural adaptation to colonial influences as well as the need for ventilation and thermal comfort in the tropical climate. The windows installed in each house module serve not only for illumination and air circulation but also embody the Bugis belief system that link to the significance of odd numbers, which are thought to bring balance and protection. The stairs connecting the *kolong* (the lower part of the house) with the *ale bola* (the central part of the house) act as a link between the public space below and the private space above, reinforcing the social structure and hierarchy within Bugis culture. Overall, these elements not only define the physical function of the house but also express the cultural and spiritual identity of the Bugis people.

In the roof of Saoraja Seng, the absence of *timpalaja* a significant marker in traditional Bugis architecture indicating the social status of the homeowner—is notable. *Timpalaja* are decorative elements installed on the roof of a house, serving as a visual indicator of the social hierarchy and status of the homeowner within the Bugis society. The number of *timpalaja* typically adheres to odd numbers such as 1, 3, 5, 7, or 9, which hold specific meanings in Bugis customs and traditions. These numbers signify the level of status and honour of the homeowner and provide social information that helps the community understand an individual's position and role within their social structure.

In Saoraja Seng, an example of architecture constructed during the Dutch colonial period, the use of *timpalaja* is notably absent. This omission may reflect the influence of cultural changes and adaptation to the more universal architectural norms of the colonial era, which might not

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accommodate local symbolism such as *timpalaja*. The absence of *timpalaja* on the roof of Saoraja Seng indicates that while traditional Bugis architectural elements were retained in some aspects, there were also adjustments and modifications made to align with the broader social and political context of the time.

It is important to recognise that although *timpalaja* are absent in Saoraja Seng, the structure and design of the building still uphold Bugis cultural values and functions. The adaptation of the roof design and other elements in response to colonial influences exemplifies how architecture can act as a bridge between local traditions and social transformations. This underscores the complex interplay between preserving cultural heritage and accommodating external influences, revealing how cultural identity can evolve and adapt while maintaining respect for traditional practices.



Pict. 16. Nine of window bar as one of social status symbol in the Bugis island

Photographer : Andi Abidah 2015

In Saoraja Seng, each window in the *lontang* features the SulawesiMalay-style window with 11 layers of ventilation and 9 bars (refer to Pict. 16). The use of odd numbers in these elements reflects adherence to Bugis traditions, which hold that odd numbers possess symbolic and spiritual significance. According to Abidah (2016b), the application of odd numbers in house elements is not only related to practical functions but also represents a form of respect for the cosmology and spiritual values of the Bugis community. The odd numbers, such as 11

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layers of ventilation and 9 bars, serve to maintain energy balance and protect the house from negative influences, while also preserving harmony with the surrounding environment.

liver(1997a) explains that vernacular architecture often integrates symbolic elements that reflect local cultural values and belief systems. In this context, the design of Saoraja Seng's windows with odd numbers reflects the incorporation of local traditions into architectural design, demonstrating how the physical form of a building can conveys cultural values and spiritual beliefs. Additionally, Roger (1992) argues that architectural design should not only fulfil functional needs but also reinforce cultural identity and beliefs. Therefore, the window elements in Saoraja Seng not only serve practical functions but also continue to depict traditional cultural practices within a modern context.

In Bugis architecture, stairs serve a pivotal role as a transitional element between public and private domains, and also symbolise social status and rank. TraditionallyAbidah(2016b) explained that noble Bugis residences typically feature an odd number of steps—often 13—to signify elevated social status and honour. Conversely, Saoraja Seng incorporates only 9 steps, a common number associated with the residences of ordinary individuals. While the application of an odd number aligning to Bugis cultural and spiritual beliefs,, the reduction in the number of steps suggests an adaptation to external influences or shifts in social norms during the era of the house's construction.

According to Strauss (1963), architectural elements such as stairs can be viewed as part of a system reflecting social and cultural structures. In this context, even though Saoraja Seng features only 9 steps, the presence of a beam marking the staircase reflects the symbolism of social status. This beamindicates that the house is reserved for nobility, underscores a deep layer of meaning embedded within the philosophical design of the house, integrating traditional elements synergising to colonial influences.

Rapoport(1969) argued that architectural elements frequently reflect the cultural context and values of the society that constructs them. In Saoraja Seng, despite the reduction in the number of steps, the beam used on the staircase illustrates an adaptation to social changes while maintaining traditional symbolism. This adjustment reflect the shifts in social status or colonial influences impacting the traditional architectural design.

Oliver(1997a) emphasised the significance of symbolism in vernacular architecture, where elements such as stairs serve not only as practical functions but also convey cultural and social meanings. The use of a beam on the stairs of Saoraja Seng, despite the reduced number of steps, reflects an effort to preserve cultural identity and social status within a changing context.

Turner et al. (1969) explained how symbolic elements within social structures, such as stairs, function as transition marker and status distinctions. In Saoraja Seng, the staircase reflect the status, and reinforces the transition between public and private spaces through its symbolic meaning of social status.

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Christopher et al. (1977) further emphasises the importance of design reflecting the needs and values of a society. In the context of Saoraja Sengstaircase design, it demonstrates an adaptation to modern needs while preserving key elements of traditional design.

Marshall, (n.d.) posits that the design and physical structure of objects such as stairs reflect the social and economic relationships within a society. In this context, the staircase of Saoraja Seng, despite using a smaller odd number of steps, it embodies the social structure and cultural symbolism significant to the Bugis community. This illustrates how architectural elements can serve as markers of social and cultural identity within a broader context.

In particular, Relph (2022) explores how vernacular architecture reflects local identity and values. The staircase of Saoraja Seng, despite having only nine steps, demonstrates an effort to maintain Bugis cultural identity while adapting to change. The use of beams as status markers on the staircase signifies the integration of local traditions with external influences, depicting how architectural elements can bridge the past with evolving social contexts.

Maurice(2009) however argues that cultural elements, including architecture, serve as expressions of social structures and communal beliefs. The beams on the Saoraja Seng staircase act as symbols of status and social boundaries, illustrating how architectural design can reflect and reinforce social hierarchies and cultural identities.

Furthermore, Henri (1991) also pointed out that social interactions, power dynamics, and cultural valuesthrough Saoraja Seng staircase not only serves as a physical transition between public and private areas but also represents the creation of social space that mirrors underlying power structures and cultural values.

4.4 Ornaments

Waterson(1990) discusses the function of the anjong ornamentthat often feature floral and faunal forms, serves as a protective element against negative energies or *doti*. This reflects the Bugis community's belief in the symbolism and spiritual protection embedded within their architectural practices.

The ornaments at the apex of Saoraja Seng include the symbols of *pucuk rebung* (bamboo shoot), *segi empat lawasoji* (square motif), and *bunga parenrengi* (parenrengi flower), each carrying profound symbolic meanings within Bugis culture.

Pucuk rebung symbolizes hope and prayer, representing the continuous cycle of life from birth to old age. The meaning behind this symbol lies in the fact that the bamboo shoot, initially growing as a young sprout, remains valuable throughout its life, even after being harvested. This reflects values of immortality and sustainability, indicating that an individual’s contributions and benefits are still valued even after their passing.

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Segi empat lawasoji embodies significance related to the four cardinal directions and the four virtues expected of individuals. It represents the principal directions in Bugis cosmology, symbolising the key qualities that are esteemed within the community: honesty, justice, wisdom, and courage. Therefore, the square not only serves an aesthetic function but also functions as a moral and ethical symbol, reflecting fundamental principles in Bugis social life.

Bunga parenrengi as an ornamental element, adds both aesthetic and symbolic dimensions to the roof. Typically, this flower symbolizes beauty and prosperity and is often associated with positive values that are hoped to be present in the daily lives of the Bugis people.

Overall, the ornaments at the ends of the Saoraja Seng roof serve not only decorative purposes but also convey profound spiritual and ethical meanings, reflecting the beliefs and cultural values of the Bugis community.

Turner et al. (1969), explores how symbols within a society function to mark transitions and social roles. The motifs of pucuk rebung, segi empat lawasoji, and bunga parenrengi on the Saoraja Seng roof serve not only as aesthetic elements but also as symbols that facilitate the understanding of the Bugis community's cultural and ethical values. Each ornament represents significant aspects of life and morality, playing a role in upholding and reinforcing social and spiritual structures within the cultural context.

Furthermore Oliver (1997b) explains that vernacular architecture often incorporates symbolic elements reflecting local cultural values. The ornaments such as *pucuk rebung* and *segi empat lawasoji* on the Saoraja Seng roof exemplify how architectural design transcends practical function to embody cultural values and beliefs. These elements not only reinforce cultural identity but also emphasize continuity and sustainability within the local context.

In particular, Juhani (2024) argues that architecture functions as a language conveying human meaning and experience. The ornaments on Saoraja Seng, such as *pucuk rebung* and *segi empat lawasoji*, can be seen as a visual language that communicates messages about hope, moral values, and perpetuity. These elements create both aesthetic and spiritual experiences for the occupants and observers of the house, emphasizing the role of architecture in conveying deeper cultural and emotional significance.

Maurice (2009) further argues that cultural elements, including architecture, serve as expressions of the social structure and beliefs of a society. The ornaments on the roof of Saoraja Seng, with their symbolic meanings, reflect the social structure and belief system of the Bugis people, linking physical elements with profound cultural and spiritual values.

Relph(2022)emphasizes on how architecture reflects cultural and local identity. For example the *pucuk rebung* and *bunga parenrengi*, are manifestations of Bugis cultural identity preserved through architectural design, illustrating how architectural symbolism functions to assert and maintain the uniqueness of its local culture.

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Other than symbolism, the elements in architecture can be viewed as signs reflecting social and cultural structures (Strauss, 1963). The ornaments on the roof of Saoraja Seng function as signs, emphasizing Bugis symbolic role that synergise to their architectural context.

In particular, the physical design and structure Bugis traditional house reflect their social and economic relationships(Marshall, n.d.). for example the ornaments of *lawasoji quadrilateral* and *pucuk rebung*reflect the underlying cultural values of the Bugis communitydemonstrating material representations of social and cultural values.

CONCLUSIONS

This study explores the transformation of traditional Bugis architecture with a focus on Saoraja Seng in Soppeng Regency. Saoraja Seng represents a shift in Bugis architectural practices adapted to colonial influences and modern needs. The research examines the adaptation of traditional design elements such as the hip roof, Malay-style windows, and symbolic ornaments like *pucuk rebun*g and *segi empat lawasoji*. Through the analysis of architectural changes and their cultural implications, the study reveals how Saoraja Seng integrates traditional Bugis aesthetics with colonial architectural influences while preserving cultural and symbolic values. The theoretical frameworks of Claude Lévi-Strauss's structuralism and Paul Oliver's vernacular architecture principles are employed to understand how these adaptations reflect changes in the social and cultural context. The findings highlight the dynamic nature of architectural traditions and the ongoing negotiation between heritage and modernity in Bugis architecture.

REFERENCES

Abidah, A. (2016a). Applying Uneven Number (Te'gennebali) of Certain Elements in Bola Ugi District of Soppeng South Sulawesi, Indonesia. *Procedia Engineering*, *161*. https://doi.org/10.1016/j.proeng.2016.08.717

Abidah, A. (2016b). Applying Uneven Number (Te'gennebali) of Certain Elements in Bola Ugi District of Soppeng South Sulawesi, Indonesia. *Procedia Engineering*, *161*, 810–817. https://doi.org/10.1016/j.proeng.2016.08.717

Alexander Christopher, Ishikawa Sara, & Silverstay Murray. (1977). *A Pettern languange*. Oxford.

Bloch Maurice. (2009). *Prey into Hunter*. CambridgeUniversityPress.

Claude Levi Strauss. (1963). *Struktural Anthropology*. BasicBook,inc.

Edward Relph. (2022). *Place and Placelessness* . SAGEPublicationltd.

Gordon Jr., C. (1996). About the house: Lévi-Strauss and Beyond. *Mana*, *2*(2). https://doi.org/10.1590/s0104-93131996000200010

eISSN 3030-5543

LEFEBVRE HENRI. (1991). *The Production of Space*. Blackwell.

Oliver, P. (Ed.). (1997a). *Encyclopedia of Architecture of the world* (Volume I T). Chamridge University Press.

Oliver, P. (Ed.). (1997b). *Encyclopedia of Vernacular Architecture of The world: Vol. 2 Culture*. Cambrige University Press.

Pallasmaa Juhani. (2024). *The Eyes of the Skin : Architecture and the sense* (Four the). JhonWilly&Son.

Pelras, C. (1996). *The Bugis*. Oxford University Press Pte Ltd.

Rapoport, A. (1969). House form and culture / Amos Rapoport. *House Form and Culture / Amos Rapoport*, *1969*(1969), 1–99. https://doi.org/1969

Rapoport, A. (1979). an Interview With Amos Rapoport on Vernacular Architecture. *M.E.T.UJournal of the Faculty of Architecture*, *5*(2), 113–126.

Richard G Roger. (1992). *Architecture Modern Theory*. Thames&Hudson.

Sahlin Marshall. (n.d.). *Stone Age Economics*. Aldine*Anterto.

Turner, V., Abraham, R., & Harris, A. (1969). *The Ritual Process Structure and Anti-Structure* (Vol. 1). Routledge.

Waterson, R. (1990). *The Living House An Antrhropology of Architecture in South-EastAsia*. Oxford University Press Pte Ltd.

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TIMBER DEFECTS IN TRADITIONAL MALAY HOUSE: A CASE STUDY OF RUMAH KUTAI KAMPUNG SELAT

Haryati Mohd Isa[1*], Muhammad Ruzaini Ramlan[2], Othman Mohd Nor[3], Najat Affendy Dzulkifly[4] & Khairul Adham Ibrahim[5]

[1,2,3,4,5]Affiliation: Department of Built Environment Studies and Technology, College of Built Environment, Universiti Teknologi MARA, Perak Branch, 32610, Seri Iskandar, Perak, MALAYSIA

*Corresponding Author: harya966@uitm.edu.my**

Abstract: Timber traditional houses can bring a significant image of Malaysian built environment heritage. Indeed, it is one of the most valuable treasures that must be sustained for future global reference thus, the building owner and the professional must undertake the responsibility to ensure that these assets are in good condition and safe for its occupants. This paper aims to identify the nature of timber defects that occurred in Rumah Kutai Kampung Selat. Two research objectives had been established (i) to identify the types of timber defects and (ii) to determine the causes of the occurrence of the defects. A mixed-method approach was adopted. The building inspection was carried out from the external to the internal of the building. All timber defects for each building element were recorded in the conditional survey form. The data were analysed using frequency analysis to measure the frequency of the defects manifested. The findings suggest that with a proper methodology in place, there is much that can be learned from studying the cause of the defects. It will provide some insights to the owner/caretaker in planning to repair for replacement work to sustain the house.

***Keywords*:** Timber traditional house, rumah kutai, timber defects, causes, learned

INTRODUCTION

There are many traditional Malay houses scattered around Malaysia. Although it had been built from decades to centuries, these houses created significant images of Malaysian built environment heritage. According to Nurfaisal et al (2020), a traditional Malay house portrays the uniqueness of Malay architecture and cultural value to the society. Indeed, it is one of the

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most valuable treasures which are sustained for future reference universally. Societies worldwide have recognized the need to preserve their valuable cultural heritage (Mustafa et al., 2020), and decision makers have emphasized heritage preservation as represented by the Sustainable Development Goals (SDGs) 2030. SDG 11 addresses sustainable cities and communities, with the aim to "make cities inclusive, safe, resilient, and sustainable". It provides a comprehensive framework for heritage buildings, particularly Target 11.4, that seeks "to strengthen efforts to protect and safeguard the world's cultural and natural heritage". Heritage preservation also helps to reduce landfill waste, demolition energy use, and resource consumption for new constructions. This is consistent with SDG 12, Target 12.5: "by 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse".

Nevertheless, Seo et al (2009) reported recently, the traditional Malay house has been affected by the rapid modern development and faces the threat of being demolished or transformed into a brick house. Nor Haniza et al., (2007) added that due to Malaysia's climate and location in the tropics is classified as tropical with high temperatures, high humidity and heavy rainfall. This will lead to timber defects and deterioration Thus, the house owner and the professional must ensure that these assets are in good condition and safe for their occupants (C. Ani et al., 2009). One of the methods is by conducting building condition survey to identify the type of defects, location of the defects and causes of the defects so that an appropriate solution can be made.

This paper aims to identify the nature of timber defects that occurred in one of the traditional malay house in Perak i.e Rumah Kutai Kampung Selat. In line with this aim, two research objectives had been established (i) to identify the types of timber defects and (ii) to determine the causes of the defect's occurrence.

LITERATURE REVIEW

2.1 Defects and Deterioration of Timber Buildings

Defects are common phenomena which occur on any structure or building (Kartina et al, 2018) and (Mydin, 2016). Defects can be defined as a failure or shortcoming in the building's function, performance, statutory or user requirements, and this may occur in its structure, fabric, services or other facilities (Carillo, 2006; Peng & Wee, 2001).). It occurs not only in the building operational phase but also before and during the construction stage (Lateef et al, 2010; Kian, 2001). Failure to address defects would most likely contribute to additional rectification costs, hamper the smooth operation of the building, and reduce its service life. In extreme cases, defects may even lead to accidents and disasters (Groblier & Pretorius, 2002).

Traditional Malay houses in Malaysia, famous for their uniqueness in design and aesthetic value, are mainly constructed with timber materials. There is a pressing need to conserve this valuable heritage, as these timber building structures and elements are subjected to decay and deterioration caused by environmental factors. Civil laws and other protective measures

are necessary to save these heritage buildings and important timber structures from destruction. Nevertheless, preventive treatment alone does not promise to restore the timber buildings and structure to their former condition but will at least stop further deterioration. Under proper conditions, timber provides excellent, lasting performance. However, it also faces several potential threats to service life, including fungal activity and insect damage which can be avoided in numerous ways. Mydin (2016) explained that timber buildings are also exposed to several potential threats to service life, including fungus, insect damage and wear and tear process. In addition, M. Nurfaisal et al, 2020 highlighted other typical timber defects such as timber shakes, twisted, cup, bow, split, peeling off paint and unwanted plant growth.

According to Ridout (2000), S. Johar et al (2013) and Mydin (2016), these defects can be divided into four main wood deterioration agents such as:-

a. Biological agents are well known for their catastrophic attacks. This deterioration agent can be classified into two namely fungi and insects/ small animals. Soft, brown and white rot are typically grouped into fungi. Meanwhile, beetles, termites, ants, bees and birds are an example of insects/small animals

b. Physical agents are imperfections and aesthetical defects in the wood itself. It was naturally born, known for its hollow, knots and cracked features before being consumed by users

c. Chemical agents are acids that make the wood brittle and wood fibers become separated resulting in a mass of sharpened filaments detectable on the surface. These defects can usually be found in industrial areas with high pollution

d. Mechanical agents are commonly due to mechanical friction during handling and processing, such as cutting and drying. The combined effects of light, wind and water movement produce stresses resulting in small surface checks and cracks

Some of the agents are significantly less damaging and usually affected only the aesthetic value. However, biological agents and moisture problems are the two most common defects that occurred and caused serious wood deterioration (S. Johar et al, 2013). Visual inspection is the easiest and the most fundamental method to use to inspect the existing structure. However, this method may not be applicable on the defects that do not appear on the surface. Hence, a non-destructive test will be used to assess the properties of material, component or system.

Since most of the traditional timber houses use famous local hardwood with fine carpentry skills that are rarely seen today, thus, conserving timber houses are as important as conserving other heritage buildings. According to S. Johar et al (2013), Siti (2011), Fielden (2000), conservation is a practice that highlights the importance of preserving cultural properties and

safeguards the object from destruction, decay and unintentional changes to prolong the life span of the existing cultural and natural importance.

Although building defects cannot be avoided, argued that it needs to be learned in providing valuable insights to the industry (Haryati (2016); Wardhana & Hadipriono, 2003; Ilozor et al. 2004; Samuel and Isaac, 2018). Findings from the survey will provide some insights to the owner/caretaker in planning the repair for replacement work to be undertaken to sustain the building. By systematically recording and tracking defects, the types, causes and categories of each defect can be identified. Moreover, recurring defects can also be traced.

RESEARCH METHODOLOGY

A qualitative research approach was adopted. The crucial stage in this research is to assess the existing condition of the building through a building condition survey. A pro-forma survey was established as a checklist and being used to identify the types of timber building defects, the possible causes and the location of defects. The inspection was carried out in early November 2023 using visual inspection to diagnose building defects for the traditional malay house and evaluated using Building Assessment Rating System (BARIS) score. At the time of the survey, the weather condition was a sunny day.

A few observations and procedures needed to be followed such as a top to down approach, which starts the inspection from the highest level of the house i.e roof space. Then, the survey will be moved from the internal building to the external façade with reasonable care. Several significant information on the building background was taken into consideration. Various tools and equipment's such as spirit level, digital caliper, moisture meter, laser distance, measuring tape, tapping rod and L square were used during the condition survey.

FINDINGS

Based on the analysis of building defects obtained from the conditional survey, it was found that Rumah Kutai Kampung Selat involved several defective works. The types and causes of the defect's occurrence are illustrated below.

4.1 Defects Analysis by Matrix and Element

4.1.1 Defects Analysis by Matrix

Figure 3 depicts the percentage of defects for Rumah Kampung Selat according to the matrix classifications as mentioned in CPBS 101: Code of Practice for Building Inspection Report/BARIS.

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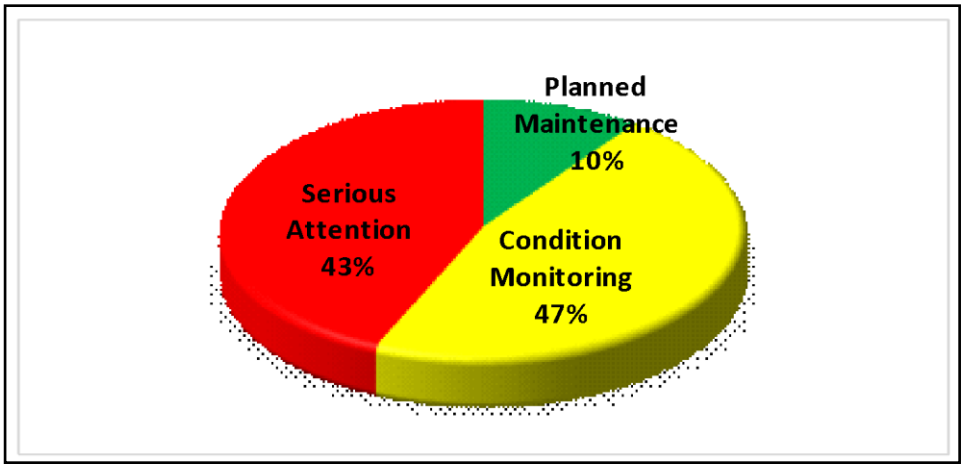


Figure 3: Defects Analysis by Matrix

Majority of the defects occurred falls under condition monitoring (47%). These defects need to be constantly monitored before it became a major defect. The second highest is defects categorised in serious attention and need urgent actions (43%). Defects under planned maintenance classification is the least defects matrix (10%) and it did not harm the occupants.

4.1.2 Defects Analysis by Element

Figure 4 represents the percentage of defects according to 10 elements involved in Rumah Kutai Kampung Selat.

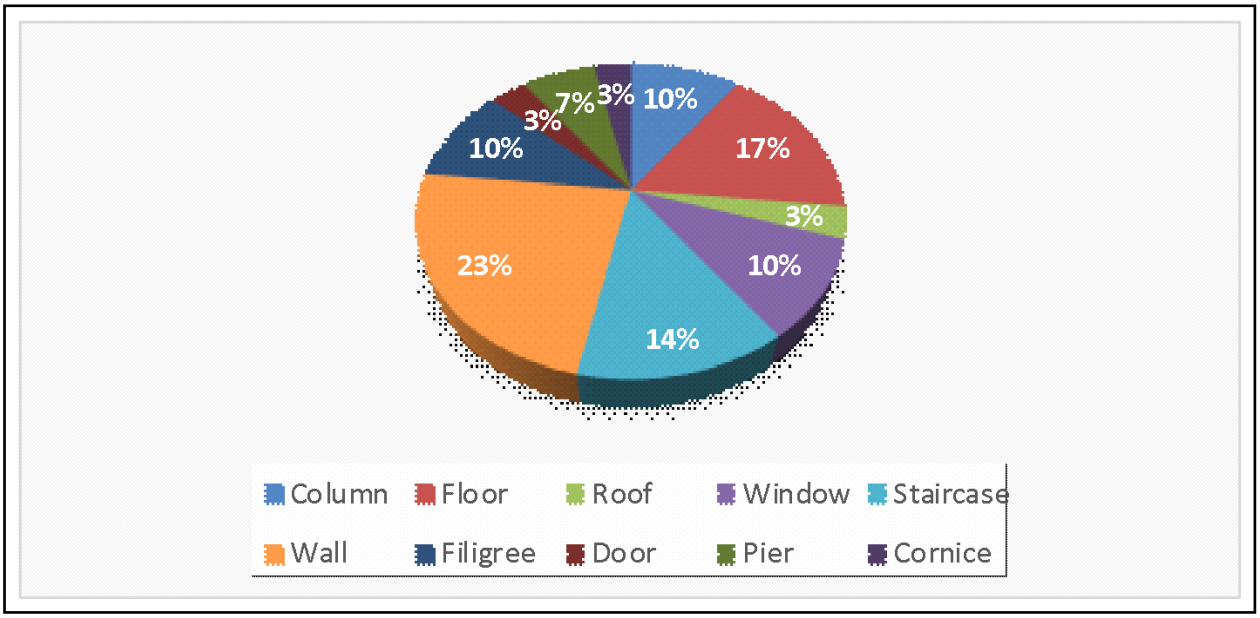


Figure 4: Defects Analysis by Elements

It is found that wall is most defective element (23%), followed with floor (17%), staircase (14%) and Others i.e window, filigree and columns (10%). The least defective elements are roof, door and cornice which represents 3% of the defects.

4.2 Type of Defects

Table 1 shows that there are 30 types of defects occurred in Rumah Kutai Kampung Selat. Broken is recorded as the most frequent type of defects and mould growth as the second most type of defects (14%). Missing, crack and decay/rotten represents 10%, followed by loose (7%) and checks (4%). Fungus attack, crooked, discoloration and knot are the five least type of defects (3%) recorded at Rumah Kutai Kampung Selat.

Table 1: Types of Defects

Type of Defects	Percentage (%)	Rank
1. Checks on column surface	4	5
2. Decay/Rotten of timber floor joist, staircase carriage and rafter	10	3
3. Crack on timber column, foundation pier and timber column surface	10	3
4. Missing of timber floor on staircase landing, timber window and window panel	10	3
5. Knot holes on wall frame	3	6
6. Broken of timber frame on internal wall, external and top filigree, timber floor joist, external timber concrete, timber staircase tread, staircase newel, external timber cornice	30	1
7. Discoloration of timber filigree	3	6
8. Loose of timber external wall panel	7	4
9. Crooked on timber internal floor	3	6
10. Mould growth on timber foundation pier, external timber wall, timber floor joist, filigree joist	14	2
11. Fungus attack on window surface	3	6

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4.3 Causes of Defects

Table 2 presents the causes of defects occurred in Rumah Kutai Kampung Selat.

Table 2: Causes of Defects

Type of Defects	Causes of Defects
1. Checks on column surface	Age of material
2. Decay/Rotten of timber floor joist, staircase carriage and rafter	Termite attacks, weather condition, old material effect
3. Crack on timber column, foundation pier and timber column surface	Age of material, mould growth, checks
4. Missing of timber floor on staircase landing, timber window and window panel	Wear and tear, human activities, weather condition
5. Knot holes on wall frame	Insect attack
6. Broken of timber frame on internal wall, external and top filigree, timber floor joist, external timber concrete, timber staircase tread, staircase newel, external timber cornice	Insect attack, termite attack, weather condition, old material effect, crack
7. Discoloration of timber filigree	Weather condition
8. Loose of timber external wall panel	Old material effect, weather condition, wear and tear
9. Crooked on timber internal floor	Weather condition
10. Mould growth on timber foundation pier, external timber wall, timber floor joist, filigree joist	Weather condition
11.Fungus attack on window surface	Weather condition

Among the main causes of the defect's occurrence are due to age of material, termite attacks, weather condition, old material effect, mould growth, checks, wear and tear, human activities, insect attack and crack.

CONCLUSION

Overall, the present study achieved in addressing the mentioned objectives, namely, (i) to identify the types of timber defects and (ii) to determine the causes of the occurrence of the defects.

The main building defects that occurred at Rumah Kutai Kampung Selat is broken of timber elements resulting from insect and termite attack, weather condition, old material effect and crack. Majority of these defects are due to termite attacks, particularly the main timber structure elements, which are in critical stage, since it will adversely affect in the context of safety and health issues. Therefore, it is suggested for essential repair practice, particularly in the context of conservation of historic buildings, the restoration work should be carried out by using a 'minimal intervention' approach.

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REFERENCES

Carrillo, P. (2006). Lessons learned practices in the engineering, procurement and construction sector. Engineering, Construction and Architectural Management, 12(3), 236-250.

Che Ani, A. I., Zaharim, A., Mohd Fisol, M. Z., Mohd Taw H. N, & Surat, M. (2009). Timber defects in building: A study of Telapak Naning, Malacca, Malaysia. WSEAS Transaction on Environment and Development, 1(5), 109-118.

Chong, W. K., and Low, S. P. (2005). Assessment of defects at construction and occupancy stages. Journal of Performance of Constructed Facilities, 19(4), 283-289.

Fielden, B.M., 2000. Conservation of Historic Buildings. Architectural Press, Oxford.

Grobler, K., and Pretorius, L. (2002). An evaluation of design-build as procurement method for building a civil engineering projects in South Africa. Journal of South African Institution of Civil Engineering, 44(1), 13-19.

Haryati, M. I, Kharizam, I, Halmi, Z & M. Fadli, O. (2016). Tracking architectural defects in university building in Malaysia. MATEC Web of Conferences 66, IBCC 2016.

Ilozor, B. D., Okoroh, M. I. and Egbu, C. E. (2004). Understanding residential house defects in Australia from the State of Victoria. Building and Environment, 39(3), 327-337.

Kartina, A., M.Fisal,I and M.Azim, M.W. (2018). Perak heritage mosques: evaluating the defects of building elements. Malaysian Journal of Sustainable Environment, 4(1), 77-93.

Kian, P.S. (2001). A review of factors affecting building defects in Singapore. Dimensi Teknik Sipil, 3(2), 64-68

Lateef, O.A., Mohd Faris, K., and Arazi,I. (2010). Sustainability in the context of maintenance: building defects in the Malaysian university campuses. Journal of Retails and Leisure Property, 9(2), 137-149

Mohd Nurfaisal, B., Mohd Sabrizaa, A. R., Mohd Khairul, A. H. B., Nur Fadhilah, B, & Kartina, A. (2020). Expanding the longevity of traditional malay's architecture identity: Diagnosing a timber building defect of Perak traditional malay house. International Journal of Solid State Technology, 63(3), 183-196.

Md Azree, O. M. (2016). Building defects and failure of Malay timber house: Causes and symptoms. Jurnal Teknologi, 76(5), 442-450.

Nor Haniza I, Zuraini M.A, Yacob, O & Helena, A.H (2007). Case studies on timber defects of selected traditional houses in Malacca. Journal of Design and The Built Environment, 3(1), 81-90

Pheng, L.S., and Wee, D. (2001). Improving maintenance and reducing building defects through ISO 9000. Journal of Quality in Maintenance Engineering, 7(1), 6-24

Ridout, B. (2000). Timber Decay in Buildings: The Conservation Approach to Treatment. E & FN Spoon, London & New York.

Samuel, E, and Isaac, O. (2018). Learning models for effective propagation of sustainable construction practices in the built environment. Malaysian Journal of Sustainable Environment, 4(1), 113-136.

Seo, R.J., Saari, O., & Young E.K. (2009). Modernisation of traditional malay house in the Kampung Baharu (Kuala Lumpur). Green Tech, Eco Life and Sustainable Architecture for Cities of Tomorrow, 334-341.

S. Johar, A. I. Che-Ani, N. M. Tawil, M. Surat, S. N. Kamaruzzaman (2013). Preliminary Survey and Defects Analysis of Traditional Timber Mosques in Malaysia. WSEAS Transactions on Environment and Development, 9(1), 119-129.

Siti Norlizaiha. H (2011). Heritage Building Conservation in Malaysia: Experience and Challenges. WSEAS Transactions on Environment and Development, 9(1), 119-129.

Wardhana, K., and Hardipriono, C. (2003). Study of the recent building failures in the United States. Journal of Performance of Construction and Facilities, 17(3), 157-158

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PRINCIPLES OF TRADITIONAL MALAY HOUSE SPATIAL PLANING AS VERTICAL MODERN DWELLING DESIGN CONCEPT

Nordin Misnat[1*], Mazlan Mohd Tahir[2], Mohamed Nizam Abd Aziz[3] & Norfazillah Ahmad[4]

[1,2,3,4]Affiliation: Department of Built Environment Studies and Technology, College of Built Environment, Universiti Teknologi MARA, Perak Branch, 32610, Seri Iskandar, Perak, MALAYSIA

Faculty of Built Environment and Engineering, Universiti Kebangsaan Malaysia, Bangi, Selangor, Malaysia

*Corresponding Author: nordi459@uitm.edu.my**

Abstract: The quality of houses should be appropriate for their role, manner of life, culture, and economy. The Malays' living space reflects their personalities and is founded on the Islamic religion in accordance with Syariah. Comfort, safety, health, tranquility and aesthetic factors all contribute to the well-being of the inner space, resulting in a blessed house. Today's homes cannot respond properly to the needs of their occupants and are heavily impacted by the west. It is opposed to the needs of the local design community, particularly the Malays. In comparison to the design of traditional Malay house (TMH) architecture, this concept and architectural approach have met many factors in attaining its objectives. The findings will be the basis for addressing the main issues and to recommend the application of the conceptual Malay heritage design in the design towards the creation of quality interior design dwelling as design concept toward cultural-tradition resilient.

***Keywords*:** *Traditional Malay House, Spatial Planning, Green Design, Principles, Wellbeing*

INTRODUCTION

A residential home serves as a sanctuary from peril, inclement weather, and environmental factors (Talib. A, 2010). Homeownership is the aspiration of every individual. The home serves not only as a refuge but also as the cornerstone of both structure and life development. The quality of a home's interior space significantly impacts the success of an individual's life. This

attribute pertains to the interaction of architecture, interior space, and the environment. Residential spaces should be created to harmonize physical, human, and environmental elements to promote the well-being of inhabitants in accordance with the rhythms of daily life, (Mastor, 2012; Mat, 2010; Hashim & Abdul Rahim, 2010; Monir, 2007; Talib, 2005).

Environmental sustainability is increasingly a significant issue in the interior design sector due to the substantial resources required for interior applications (Ruff & Olson, 2009). Environmentally sustainable or green interior design reduces adverse impacts and enhances beneficial effects on environmental systems throughout a building's life cycle by integrating historical remedies with contemporary technology (Loftness, 2007). Pilatowicz (1995) defined sustainable interiors as those built to thoughtfully consider the effects of all their functions, components, and elements on the global environment. One of the six green approach in Maximizing the use of the space is efficiently used interior spaces can keep the size of a building and, therefore, the use of construction materials and other resources can be reduced to a minimum.

1.1 Traditional Malay House (TMH)

TMH are characterized by their distinctive architectural style, rooted in centuries-old cultural and environmental influences. These iconic dwellings reflect the harmonious integration of function, aesthetics, and the natural landscape (Elham, 2012). Featuring intricately carved wooden structures, elevated platforms, and sweeping, tiered roofs, Malay houses embody a rich heritage that has inspired contemporary interpretations in modern living spaces. The traditional Malay house is an architectural marvel, featuring a distinct design that reflects the cultural heritage and environmental adaptations of the region. As urban populations grow, the need for efficient and sustainable vertical dwelling solutions has become increasingly important. This presentation will explore how the principles of traditional Malay house spatial planning can be adapted and reinterpreted for modern vertical living designs.

1.2 Spatial Planning

The design of the Malay house is founded on several fundamental ideas. The climatic and environmental design of traditional Malay dwellings is a crucial element in their construction, aimed at creating an appropriate climate. The choice of site and building orientation relative to dawn has rendered the traditional Malay house a passive and energy-efficient design (Zulkifli Hanafi, 2014). The traditional Malay house employs a modular construction method including a unique joint mechanism that facilitates the addition and removal of dwelling modules (Mastor Surat, 2015). It is fundamentally a post-and-lintel framework and a prefabricated system installation. The erection of a timber house elevated on stilts to mitigate the effects of severe weather and flooding (Philips Gibbs, 1987). The construction impact is less than that of contemporary construction approaches. Incorporating extensive roof eaves and low walls to regulate direct solar radiation and provide protection from precipitation. High roof design features, characterized by extensive window openings and ventilated wall

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components, aim to facilitate thorough ventilation for a cooler environment (Lim Jee Yuan, 1987).

Essentially, most traditional Malay houses are individually designed to meet local requirements. The spatially fragmented and open-plan design of the traditional Malay house facilitates external wind flow and adheres to the principles of natural ventilation, hence optimizing the cooling effect. Consequently, multifunctional spaces such as anjung, serambi, rumah ibu, and dapur are not merely socially defined; they also serve to fulfil essential functions that prioritize comfort while minimizing heat gain and energy expenditure within the central area of the house. The quality of lumber utilized in building will vary based on the homeowners' position (Zulkifli Hanafi, 2014). Sustainable standard requirements, including the reduction of carbon content, have been implemented in practice and documented (Shereen Jahn, et al, 2017). Such designs serve not only as artistic expressions in design, culture, and architecture but also fulfil sustainable design principles and diminish reliance on electricity for more cost-effectiveness.

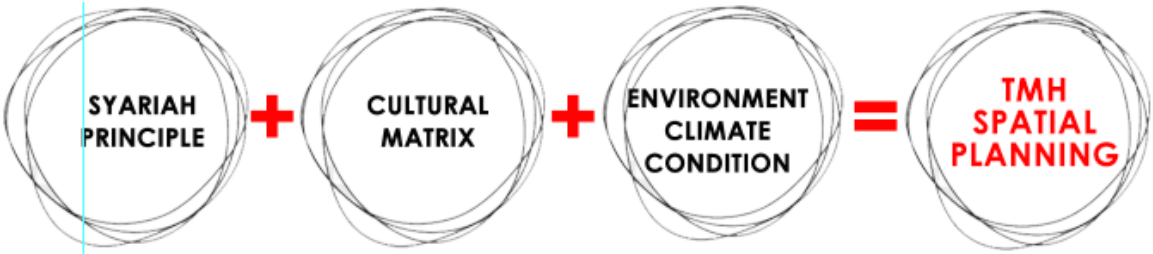


Figure 1: Factors Influencing House Form and space planning of TMH

1.3 Space Classification

Space and form in Malay tradition were design on a strong , utalirian basis. Normally space was divided between the public, the private and semi public. The notion of privacy of the family was reflected in form and arrangement. The previous researcher on the traditional Malay house explained that the spatial classification was according to the characteristics or nature of space in Malay houses. According to Abdul Rahim Abdullah (1981) traditional Malay houses are clasify into three types, namely formal rooms for receiving guest visits and used for official purposes such as Porch *(Anjung),* Verandah *(Serambi)* and kitchen *(Dapur*). Secondly is active space, it is used to carry out family day tasks such as kitchen space and washing area or *pelantar* and thirdly is passive space, involving core house *(rumah ibu)* and bedroom for family member main activity. According to Lim Jee Yuan (1987) traditional Malay house can be divided into the front and back portion which are centered around the core house (*rumah ibu)* and the kitchen (Dapur) . Furthermore, the arrangement of space within Malay houses is based on the priority of space functions and space adjacency. This space is divided into three areas namely Verandah *(Serambi),* Core House (*Rumah Ibu)* and kitchen *(Kitchen House),* Abidin (1981). Furthermore, the house's spatial organization has been created based on the occupant's needs and related with the environment surrounding, cultural activities and religion. In that sense thus, this study benefits the younger generation

in order to appreciate this relics house. Therefore the objective in this study achieved by analysing the spatial organization design and architecture of a TMH with functional diversity and to research the role of space during performance of the activities in that space. Therefore the optimal and efficient use of space with the needs and space function will be achieved. Table 1 below shows space clasification by other authors in the study of traditional Malay houses:

Table 1: Space Classification of Traditional Malay House

Space Classification	**Spatial Organization**	**Space Classification by**	**Character/Key Concept**
Based on Gender Types	Male Areas; Female Areas; Common Areas	Phillip Gibbs	
Based on Genders Type and position of space	Male areas (in front of the house); Female areas (Main House/centre of house); Space for common areas	Abdul Halim Nasir	
Based on genders type and privacy space	Dual compartmentalization concept; Front Area Zone; Back area zone; Central Zone; Public-private Zone	Mokhtar Haji Ismail	Open Plan, Linear Plan, Multifunction Space, Flexible, Clear Hierarchy, Minimalist Plan, environmentally friendly
Based on Construction technique	Standard/ basic areas; added space	Abdul Rahim Abdullah	
Based on frame/structure	Main structure; Secondary structure	Phillips Gibbs	
Based on functions	Public areas; Special area	Zulkifli Hanafi	
Based on religion; social- culture; custom	Ruang Serambi/veranda & Kitchen areas; centre areas- main house/ room	Mokhtar Haji Ismail	

Source: Mazlan (2016), Elham (2018)

1.4 Spatial Organization

The traditional Malay house comprises of several primary areas: the Anjung (porch space), Veranda (Serambi), Core House (rumah ibu), Bedroom, Loft (loteng), Kitchen, and Platform (Pelantar), Abd. Halim Nasir (1994) asserts that the configuration of the Malay traditional house is determined by the requirements and daily routines of its inhabitants. Zulkifli Hanafi (2012) asserts that the traditional Malay house addresses numerous demands, including functionality, comfort, and safety, while also fulfilling spiritual aspirations, as a good life commences at home. For the Malay community's architectural designs, it is essential to meet

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the socio-cultural criteria dictated by Islamic law. Ezrin Arbi (1997) contends that building or habitation reflects civilization. Where it encompasses spiritual values, physicality, emotionality, gastronomy, philosophy, and religion. The Malay society adeptly integrates people, nature, and spiritual beliefs into the construction of their dwellings. Table 2 below illustrates the spatial configuration of a traditional Malay dwelling.

ISSUE AND SCENARIO

The current home design failed to meet the culture and the liveable of its occupants. As a result, the design has affected the occupants. Overcrowded, poor planning, and design of the house affects the occupants vertical modern dwelling. The impact of these environmental constraints and modernity has led to social problems, unhealthy and pressure to the occupants.

Today's modern housing problems from a family point of view include involving the expansion and reduction of families and the increase of family members. The modern residence is unable to accommodate large family members as well as newly married families.

METHODOLOGY

The study examines Malay traditional house design with ideals and aspirations. The design research is based on drawing document survey on several variables and traits that give spatial planning Malay house architectural styles and their principles. Next objective says these values relate to vertical modern contemporary design residences. The study process includes observation, literature, interviews, and pertinent photography to reach the goal. This paper will primarily examine TMH spatial planning design's essential features, especially spatial organization to recommend the TMH principles as design concept for vertical home designs.

FINDING AND DISCUSSION

From an observational study of modern vertical housing focusing on PRIMA housing around Ipoh Perak, it was found that there is a difference in the use of space according to function compared to TMH houses. TMH clearly shows that the division of space according to the requirements of the Characteristic of Islamic Housing Privacy has been met. The observation found that the TMH Layout Plan meets Segregation between male and female, Segregation between public and private space, Public, Semi-Public, Private, Providing specific room for bathing, House orientation, Moderation in expenses and Cleanliness. Compared to the layout of modern house planning, it is seen to have a layout that creates privacy problems, especially when visited by guests, whether outside guests or relatives from far and near. Diagram 1 below shows the comparison that is the function and activity of the space between TMH and Modern house:

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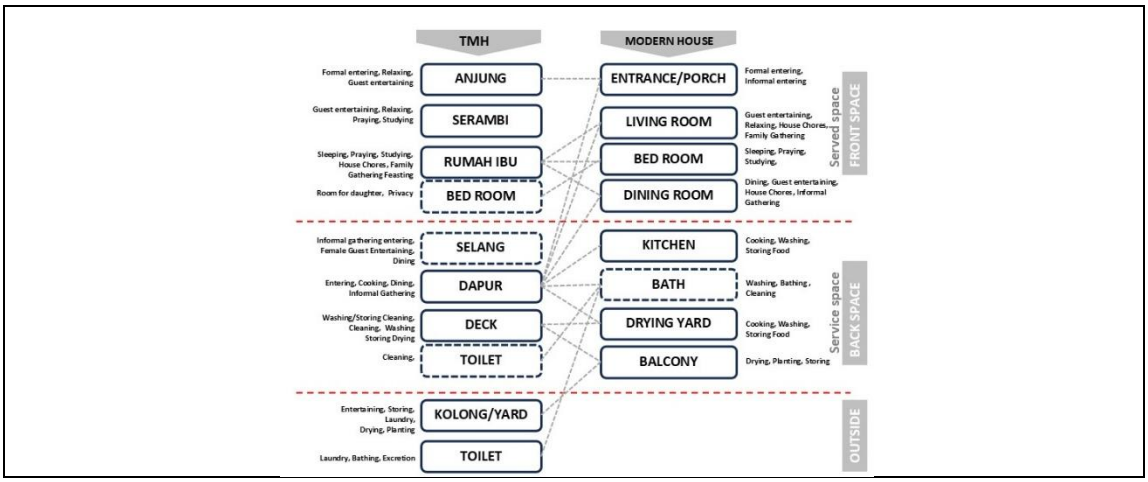
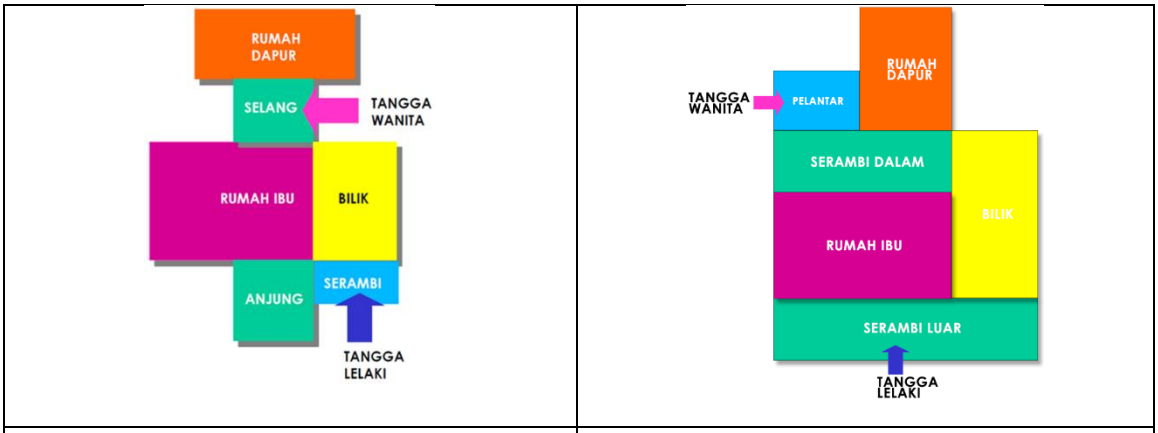
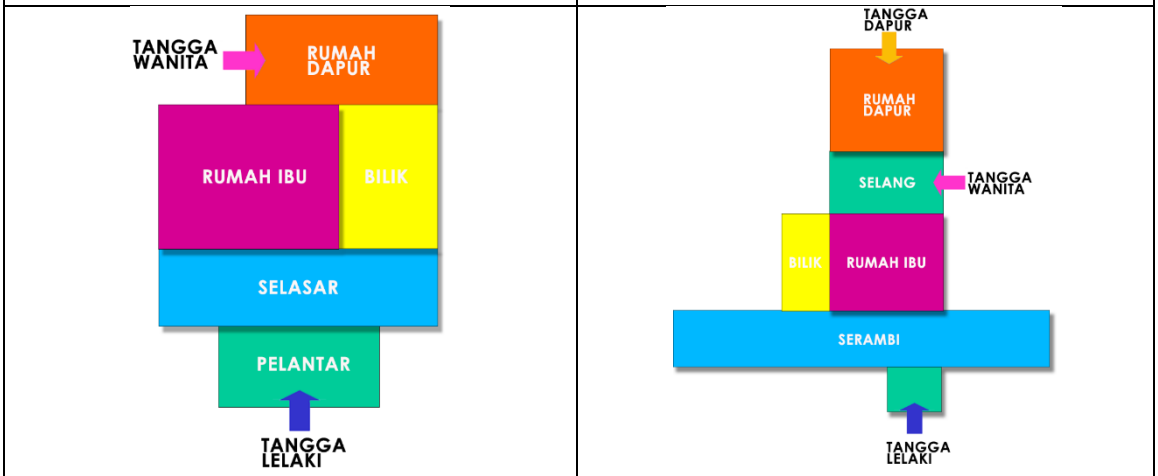


Diagram 1: Space – Activity: TMH vs Modern house *Source: writer*



Typical Spatial Planning of Limas House - TABAK (LTH)

Typical Spatial Planning of Kutai House (KPH)



Typical Spatial Planning of Rumah Bujang Terengganu House (RBH)

Typical Spatial Planning of Negeri Sembilan House (NSH)

Figure 2: TMH space planning according to traditional house types in Peninsular Malaysia
Source: writer

Figure 2 illustrates standard TMH spatial organization categorized by zones, including Rumah Limas, Rumah Kutai Perak, Rumah Bujang Terengganu, and Rumah Negeri Sembilan, as

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derived from measured drawings from *Pusat Kajian Alam Bina Dunia Melayu* (KALAM UTM), TMH research publications, and PhD dissertations. Case studies and field observations were conducted on several residences, including Rumah Tok Abu Bakar Alang Ketak (TABAK House) and Rumah Tok Sedara Bongsu in Kampung Pisang, Bota, Perak, to enhance the planning of TMH houses. Colour coding is employed to examine the similarities and distinctions among various housing styles. Initial findings indicate that the characteristics and components of TMH space planning align with past research, however discrepancies may arise from specific causes. Table 2 below presents a summary of the conducted space planning study:

Table 2: Summary of TMH spatial planning analysis study

Space	Space Classification	LTH	KPH	RBH	NSH	Function
Anjung/Porch	Public Space	✓	@	✓	✓	• Only the RBH house has a small porch to cover the main entrance stairs due to environmental and wartime pressure factors
Serambi	Semi Public	✓	@	✓	✓	• The RBH and NSH houses have a Long *Serambi* room, lower space and adjacent to the main room/ mother's house for welcoming and entertaining guests, children's sleep areas as well as guests and recite al-Quran. • The KPH house has a porch internally house due to the constraints and pressure of the surrounding atmosphere
Rumah Ibu/Core Area	Private	✓	✓	✓	✓	• Almost all category has this space with minimal furniture use, partitions and interior walls are good to allow proper ventilation and natural lighting into space. Make it a flexible and open space to carry out activities.
Bilik tidur/bedroom	Private	✓	✓	✓	✓	• All house type has a room for parents' use as well as a dressing room for virgins for privacy. • There is also a loft space for some Malay houses that serve as space for virgin and store items.
Selang/	Public	✓	@	@	✓	• Space is used for welcoming, chatting and entertaining activities for women. Apart from that, it is also used as a place to weave mats, sewing, for generate economic.
Dapur/Kitchen	Semi Public	✓	✓	✓	✓	• All house type has *rumah dapur* that used for food preparation, cooking and family meal processing.
Pelantar	Public	✓	✓	@	@	• Not all type of the house has this Space that adjacent to the kitchen to wash groceries and equipment in the process of food preparation. • Under certain circumstances, it is also used to bath the infants and mothers who are in abstinence.

Note: ✓ - Complete @ - Partly

Source: Writer

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RECOMMENDATION

Based on the results of this study, the writer would like to suggest to certain parties involved in the industry to take several steps in order to emphasize the design and the planning of space in a housing project that will be carried out in the future. Spaces like the following will add a big impact to users if applied in their space planning:

- *Kolong and Outside Compound* – Important area for daily life activity, social and for festive season should adapt in modern house space.
- *Serambi* - Modern homes have been replaced to living rooms instead of foyers to welcome and entertain guests. Do not prohibit privacy between male and female guests and host family.
- *Linear Planning* –Modern *s*pace that does not follow the hierarchy and occupants needs creates discomfort to the occupants especially when welcoming condition does not promote privacy inside this space especially during the guest's presence - Compared to the Malay house kitchens that are mostly at the back of the house.
- *Selang* – As the joining space between core house-kitchen and second entrance place is a space for women which has not been in the planning at modern house.
- *Open plan & minimalist design* – uncomplicated geometry, simple plan, inconspicuous details and honesty of materials rather than complicated and unnecessary thing.

CONCLUSIONS

Integrating TMH planning principles into modern dwellings promotes sustainability, cultural preservation and enhanced well-being. Further research is needed to explore the potential of these principles in diverse contexts, fostering a dialogue between tradition and innovation through:

i. Adapting Traditional Principles to Modern Vertical Living

- Reinterpreting the Hierarchy of Spaces
- Translate the traditional multi-level layout into a vertical arrangement of private, semi-private, and public zones within a compact footprint.

ii. Incorporating Privacy Zoning

- Utilize thoughtful placement of rooms, transitional spaces, and visual barriers to maintain privacy within the vertical dwelling.

iii. Optimizing Orientation and Placement

- Position the vertical dwelling to maximize natural light, airflow, and views while considering local climate and site conditions.

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REFERENCES

Abdul Halim Nasir & Wan Hashim Wan The (1994). Rumah Melayu Tradisi. Penerbit Fajar Bakti Sdn. Bhd.

Ar. Mastor Surat (2015). Green Principle In Sustaining Heritage Architectural Value: Towards Architectural Identity, Syarahan Akademia Universiti Teknologi MARA.

Ar. Mastor Surat (2012), Mengenalpasti Tahap Kesejahteraan Seni Bina Warisan Melayu Melalui Konsep Islam. Jurnal design and Built. Volume 5, 2012.

Ahmad Marzukhi Bin Monir (2007). *Nilai Reruang Rumah Tradisional Melayu:Pengaruh Falsafah Islam Dalam Reka bentuk Rumah Di Semenanjung Malaysia*. Universiti Sains Malaysia. Unpublished PhD Thesis.

Baessa et al. (2010). *An Evaluation of Space Planning Design of House Layout to the Traditional Houses in Shibam, Yemen, Asian Culture and History*. Canadian Center of Science and Education. Vol. 2, no 2; July 2010. www.ccsenet.org/ach

Elham Hosseini 2012. *Design Values in Traditional Architecture: Malay House*

Ezrin Arbi (1997) *Ke Arah Jatidiri Senibina Dalam Konteks Nusantara*, kertas kerja Simposium Nusantara, UiTM Cawangan Perak, Kampus Seri Iskandar. 21 Jun 1997

Gozen Guner Aktas. (2013).Design Parameters and Initiatives for Ecological and Green Design in Interior Architecture. WSEAS TRANSACTIONS on ENVIRONMENT and DEVELOPMENT, Issue 2, Volume 9, April 2013, Interior Architecture and Environmental Design TOBB University of Economics and Technology Sogutozu cad. No:43 Sogutozu, Cankaya, Ankara TURKEY

Guerin, M. K. (2009). The State of Environmentally Sustainable Interior Design Practice. *American Journal of Environmental Sciences* , 179-186.

Hashim, A. H., & Abdul Rahim, Z. (2008). *The Influence of Privacy Regulation on Urban Malay*. Archnet-IJAR, International Journal of Architectural Research , 94-102.

Kamarul Syahril Kamal, Lilawati Abdul Wahab and Asmalia Che Ahmad, (2004). Climatic design of the traditional Malay house to meet the requirements of modern living. The 38th International Conference of Architectural Science Association ANZAScA "Contexts of architecture", Launceston, Tasmania, 10–12 November 2004.

Kassim, Shireen Jahn; Mohd Nawawi, Norwina; Abdul Majid, N. H. (2017). *The Resilience of Tradition: Malay Allusions in Contemporary Architecture*. (S. J. Kashim, Ed.). Penang: Areca Books.

Lim Jee Yuan (1987). The Malay House. Rediscovering Malaysia's Indigenius Shelter System. Institut Masyarakat.

Loftness, V., Hakkinen, B., Adan, O., & Nevalainen, A. (2007). Elements that contribute to healthy building design. *Environmental Health Perspectives*, 115(6), 965-970.

Mat, N. (2010). *Ciri-ciri Fizikal Ruang Dalaman Rumah Melayu : Kajian kes Rumah Bumbung Melayu Perak.* Pulau Pinang: Universiti Sains Malaysia. Unpublished thesis.

Mohamad Tajuddin Mohamad Rasdi (2009). The Architectural Heritage Of The Malay World. Skudai: Penerbit Universiti Teknologi Malaysia.

Mohamed, S., & Baqutayan, S. (2014). The Affordable Housing Stress among Middle-Income Group. IOSR Journal Of Humanities And Social Science (IOSR-JHSS), 19(7), 82–90.IOSR Journal Of Humanities And Social Science (IOSR-JHSS), *19*(7), 82–90.

Nangkula Utaberta, et al, (2009). Rumah yang Berkembang: Pengajaran daripada Keanjalan Matematik pada Rumah Tradisional Melayu. Seminar Bulanan Etnomatematik Rumpun Melayu.

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

Pilatowicz, G. (1995). Eco-interiors: *A guide to environmentally conscious interior design*. New York: Wiley.

Raja Ariffin, R. N., Zahari, R. K., & Nadarajah, S. (2010). *Residential Satisfaction In Private Low-Cost Housing In The Urban Area: A Case Study Of The Klang Valley, Malaysia. Urban Dynamics & Housing Change* - Crossing into the 2nd Decade of the 3rd Millennium, 12.

Rapoport, A. (1969). *House Form and Culture.* Milwaukee: University of Wisconsin.

Ruff, C.L., & Olson, M.A. (2009). The attitudes of interior design students towards sustainability.

International Journal of Technology and Design Education. 19(1), 67-77. doi: 10.1007/s10798-007-9038-0

S.A. Iskandar, *Örder In Traditional Architecture House Form," Doctor of Philosophy, School of Architecture, Oxford Brookes University, 2001*

Salleh, A. G., & Yusuf, N. (2006). *Residential Satisfaction in Low cost housing in Malaysia.* Pulau Pinang: Universiti Sains Malaysia.

Sufian C.A. & Mohd. Sabrizaa A.R. (2009). An Analysis of the Traditional Malay Architecture as Indicators for Sustainability: A n Introduction to its Genius Loci. Proceedings of Arte-Polis 3rd International Conference on Creative Collaboration and the Making of Place. Bandung, Indonesia.

Talib, A. (2005). *The Perak Kutai Asli Malay House.* Universiti Teknologi MARA. Shah Alam: Unpublished Thesis.

Zulkifli Hanafi (2012). Towards a Sustainable Built Environment in Malaysia. Sustainable Design: Learning from the Traditional Malay Architecture. Universiti Science Malaysia, pp.155-177.

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EXPLORİNG THE RUMAH KUTAİ: ADAPTATİON OF THE MALAYSİAN GARDEN CONCEPT CRİTERİA

Ahmad Zamil Zakaria[1]& Nur Huzeima Mohd Hussain[2*]

[1,2]Department of Built Environment Studies and Technology, College of Built Environment, Universiti Teknologi MARA, Perak Branch, 32610, Seri Iskandar, Perak, MALAYSIA

*Corresponding Author: nurhu154@uitm.edu.my**

Abstract: Standard global design criteria for public parks include sustainability, user comfort, aesthetic value, safety, and cultural relevance. The National Landscape Department (NLD) has identified eight design criteria for developing the Malaysian Garden Concept (MGC). The MGC sets out to integrate essential garden features for both aesthetic and environmental harmony, but the spatial limitations of Rumah Kutai compounds and established living norms present difficulties in integrating these criteria. This study aims to analyse the existing landscape design of Rumah Kutai's external space using the MGC criteria and the observation method as a research instrument. The selected Kutai houses are in the Perak Tengah District. The results show that while the architecture and culture of a Rumah Kutai compound underlies concern for traditional Malay life-ways and environmental adaptation strategies, an inflexible application of MGC criteria without regard to customary practices differs from those at ecosystems level with general consideration to natural system complexity. Takeaways suggest that it is not design constraints but residents adhering to preexisting norms that challenge the MGC, implicating culture over codification. The research also finds that although the MGC provides a good measure of garden aesthetics and sustainability, it may not apply directly to Rumah Kutai due to its socio-cultural context.

***Keywords*:** Rumah Kutai, Malaysian Garden, Garden Concept Criteria, Identity, Sense of Place

INTRODUCTION

The design and function of the Rumah Kutai compound reflect the broader Malay cultural values of sustainability, community, and religious observance. The setting of agriculture,

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communal spaces, and spiritual elements are meticulously assembled into the compound to show how these spheres are composed in Malay life. Indeed, the concern with living harmoniously in sync with nature shows how rooted our Malay ancestors were in environmental care. The compounds provide a landscape and act as places for extended family members and neighbours to gather. This social function is reinforced by using these spaces for ceremonial and religious events, such as weddings, *kenduri* (communal feasts) and prayer gatherings. Thus, the lay of the land is both in Malay culture and customs.



Figure 1 & 2: External space harmony with the natural environment

LITERATURE REVIEW

In Perak, among the various traditional houses in Malaysia is Rumah Kutai. These classic houses signify a lot more than just mere abodes; they are embodiments of the conventional culture and historical lineage that exists in our location. Referring to Rashid et al. (2019), "kutai" means old/ancient in Perak. Based on the architectural perspective, Rumah Kutai is manifested as a traditional Perak Malay house, which is determined by the existence of *rumah ibu* (main house) with *Bumbung Panjang* (long roof), or can also be known as *Bumbung Melayu.*

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Landscape design is an activity that integrates the attitude of landscape as a spatial practice and is considered part of place-making, contributing to social, environmental, and ecological aspects (Clouston, 1990). An outstanding landscape means potential economic income for residents/locals and is part of the tourism product. Several barriers of implementation include a need for more awareness among stakeholders, inadequate training for landscape architects, and the complex nature of integrating various cultural aspects (Abu Bakar, 2012). According to Turner (2005), the garden theory has been contextualised as a system of explanatory ideas for understanding gardens, and in particular, focusing on general principles would be inheritance within some or all forms that might include them.

In short, the Malay Garden Concept is about beautifying a space or yard while harvesting for beauty, food to cure and social meditation through architecture (Zakaria et al., 2022). The principle underlines the need to adopt philosophy, taboos and traditions for administration by the Malay community today. These softscapes are for food, medicine, utilities, ritual and aesthetics. Hardscape is used for security, socializing and daily operations.

The initial momentum for developing a garden concept, 'Malaysian Garden', officially began in 1997. The idea was discussed for some time, and in 2009, a basic MGC guideline by the NLD was published. According to Zakaria et al. (2019), the establishment of this concept resulted from organizing a seminar and conference and joining the specified exhibitions to introduce the design concept.

he NLD outlines eight (8) MGC design imperatives for including public gardens in this guidebook. The design criteria are as follows:

1. Genius Loci - Has an inimitable spirit and cultural atmosphere that defines the stylistic, semantic, and historical quality, synthesizing them into architectural beginnings.
2. Local Plants - Ensures the plant community selected is representative of native flora in the region.
3. Architectural Structure and Local Elements - Using traditional Malaysian architectural elements in garden designs brightens cultural continuity, allowing gardening with local craft.
4. Cultural and Heritage - The garden design should also consider Malaysia's rich culture and history to make people feel proud that they are Malaysians.
5. High Intrinsic Value - This garden also provides a high aesthetic appeal and ecological value and is of recreational utility.
6. Adaptability to Local Weather - Garden design must be able to adapt or suit local climatic conditions so that the plants and materials match your regional weather conditions naturally, in this way having compatibility between garden elements and their natural context.
7. Elements of Security - Provision of the garden layout and lighting with a promised grand view, thereby assuring visitors an excellent, comfortable stay.
8. Manageable and Comfortable - Make areas comfortable for visitors with enough seating, shade, and accessibility features, as well as manageable in terms of maintenance.

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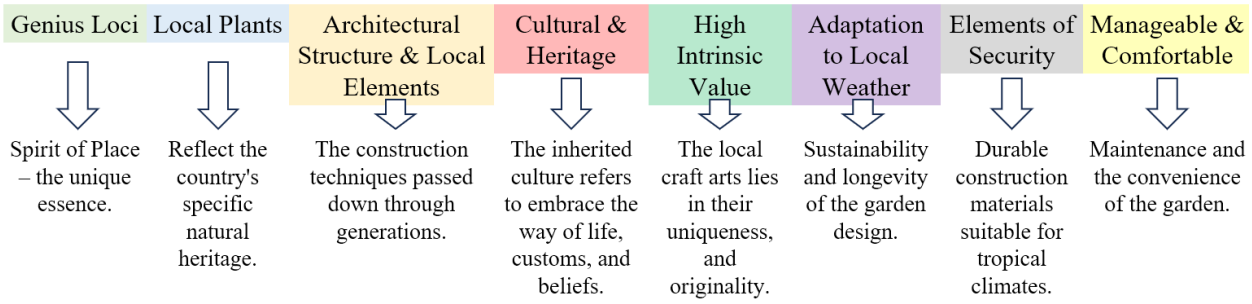


Figure 3: The Malaysian Garden Concept Criteria (NLD, 2009)

In the study of tangible and intangible heritage, the researchers' study something relatively dominant in the environment and less focused aspects, such as house compounds, gardens, and landscapes, which also help make the study legitimate. According to Mohd Hussain et al. (2022), Rumah Kutai is among the cultural landscapes characterized by large trees (overstorey) as shelters and barriers for resources and nutrition that provide food and timber. The cultural landscape will show us how to conserve a heritage object. The cultural landscape has been at the forefront of much research for a long time because it makes a nation and its civilization unique; hence, researchers always have "sustainable development" in mind (Zakaria, 2020).

METHODOLOGY

This study was conducted to obtain data by observing the space and garden design of the Rumah Kutai exterior compound. The objective of this study is to evaluate the current landscape design from Rumah Kutai's outdoor spaces which conform to MGC, emphasizing architectural spatial organization and cultural value. Samples were taken through a random selection of Rumah Kutai compounds within Perak Tengah District, and data was collected to determine the availability of landscape features and whether residents comply with MGC standards. The compound of Rumah Kutai is more than just a functional landscape; it shapes the cultural space the Malay people maintain in relation to the environment. The property layout is unsurprisingly one of sustainability and communal living in harmony with nature. Nevertheless, modernization and urbanization create significant problems in upholding these lands. However, as more Malays move to the cities, traditional knowledge ~~of~~ and practices associated with Rumah Kutai compounds may be lost forever.

FINDINGS AND DISCUSSION

The typical Malay traditional house compound is divided into four areas, according to the placement and activities carried out. Softscape is the main element in every part of the compound. The yard on Malay houses has fewer hardscape elements. Rumah Kutai, Perak, is an important cultural heritage that helps to give more depth to traditional Malay architecture and lifestyle. Its external compound and landscaping are essential in its operation, but they play a big part in the daily lives of all occupiers and their families. These conservation attempts are also needed to keep up with and pass on Rumah Kutai's cultural legacy.

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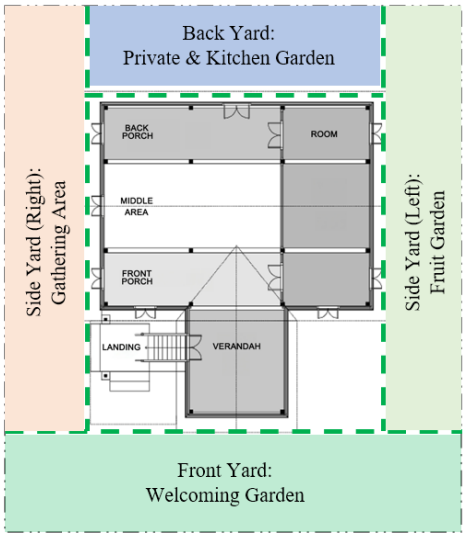


Figure 4: Typical Garden Layout of the traditional Malay house compound

Site visit to Kutai houses around Perak Tengah district to document the method of observing the exterior spaces of traditional Malay houses. Table 1 shows examples of the division of the house's outdoor space and its use by the residents of the house.

i. Traditional Layout
The enlarged compound at the exterior of a Rumah Kutai enables diverse domestic functions and good airflow around the house. This open space is the essence of a rural Malay lifestyle.

ii. Landscaping Elements
The plantation typically hosts native flora like coconut trees, bananas and other fruit-expiring plants. They produce food and shade and are a part of the ecological sustainability of one's household.

iii. Functional Features
Some vital functional components include the water supply well and a kitchen garden for fresh herbs and veggies. These elements align directly with the autonomous lives that had been a tradition for those who'd had inhabited it.

iv. Aesthetic and Decorative
Colourful flowering, ornamental plants, and other plant materials augment the landscape.

v. Cultural and Community Significance
More than just a house, the Rumah Kutai and its compound are also central to community life practices on all aspects of sociality and culture. Traditionally, events and family gatherings occur within the compound, strengthening social ties and cultural continuity.

Table 1: The division of garden space and its use

No.	Image	Characteristics
1	 Back Yard	1. Most are unkempt looking cause of lack of maintenance. 2. Growing edible plants and often some medicinal plants. 3. The original location of the outdoor toilet for traditional houses.
2	 Side Yard (Left)	1. The yard is heavily planted with local fruit plants. 2. Lawn area ~~and~~ for passive activities. 3. Lack of maintenance and safety elements
3	 Side Yard (Right)	1. There are shady and aesthetic plants. 2. Areas for meeting with neighbours and community activities. 3. There are more hardscape elements than other compounds.
4	 Front Yard	1. The most spacious area in the yard of a Malay house. 2. Car parking area and family activities. 3. Lawn area and the most maintained. 4. Less planted with large-sized plants.

The backyard of the house is the least attractive space. Many areas are characterized by a wild, unkempt appearance, mainly resulting from insufficient maintenance. Among the overgrown foliage, there are variety of edible plants thriving alongside with some valued for their medicinal properties. This setting also marks the original site of the outdoor toilet commonly used in traditional houses, hinting at these communities' historical daily life practices.

The yard on the left side of the house is also a less exciting space because of a lack of activity. It has a variety of local fruit plants, giving it quite an abundant experience. Amid this verdurous beauty lies a huge lawn perfect for recreation and relaxation. Unfortunately, the potential of this space is marred by its lack of maintenance and accessibility when it can be used to provide safer experience for everyone.

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The yard on the right side of the house is also a stimulating space because of various activities. The landscape is adorned with lush, shady plants that provide a welcoming atmosphere while showcasing striking aesthetic appeal. Welcoming areas are thoughtfully designed for neighbours to gather, fostering a sense of community and encouraging for social engaging activities. Unlike other compounds, this space boasts a higher concentration of hardscape elements, creating visually exciting architecture that complements the natural surroundings.

The house's front yard is the largest space compared to others but has a minimalist layout. The most expansive area in the yard of a traditional Malay house serves as a multifunctional space for parking and family gatherings. This section boasts a lush, well-maintained lawn, perfect for outdoor activities and relaxation. The landscaping is intentionally designed with fewer large plants, allowing for open space and a sense of airiness, making it ideal for various family events and enjoying the outdoors.

CONCLUSIONS

The MGC criteria seem improbable to implement in traditional Malay house compounds, hence a difficulty in many aspects. Lack of interest by homeowners in designing or maintaining their external spaces prevents them from installing such safety features. The resultant lack of care has the potential to sew environments that are dangerous or hostile. At present, many Rumah Kutai are left empty and deteriorated, with their lively architecture fading off the map. This erosion is a problem for the compounds' appearance and practical use. Paths and other hardscapes are kept to a minimum. However, the ornamental part of landscape design needs to be more noticed. Where the focus is mostly on showing only buildings without any surrounding landscapes, it provide viewers a relatively dull and unimaginative area of land. The art of landscape design is frequently skipped. The focus is generally on the buildings rather than much else, making the context of these structures seem lifeless. Nevertheless, the MGC criteria based on garden space size only applies in traditional house compounds because these gardens are typically tiny and too delicate for a broader meaning of beauty/harmony as viewed from a more extensive area outside. This mismatch causes a need for more adaptive criteria for traditional Malay settings. Future research should focus on the contribution of Rumah Kutai compounds to the living practice of contemporary Malay society and how those traditional areas can be translated into present urban planning mechanisms for sustainability. However, more than preserving the past, maintaining these landscapes is also how we learn from the past to build a better future.

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REFERENCES

Clouston, B. (1990), Landscape Design with Plants, Heinemann Newnes, Oxford.

J. Abu Bakar (2012), Taman Malaysia ke Arah Identiti Nasional (The Malaysian Garden Towards a National Identity), UTM Press, Johor.

Mohd Hussain, N.H., Mat Nayan, N., Ahmad, S., and Salleh, I.H. (2022), Landscape And Plants Profile Analysis In Rural Perak, Journal of the Malaysian Institute of Planners, Vol. 20(3), pp. 136 – 147. DOI: 10.21837/pm.v20i22.1133

National Landscape Department (2009), Taman Malaysia untuk diwarisi (The Malaysian garden to be inherited), Ministry of Housing & Local Government, Malaysia.

Rashid, S., Alauddin, K., Baharuddin, M.N., and Abdul Halim Choo, I. (2019), Architectural Design Evolution of the Malay Traditional Houses Along Sungai Perak, Borneo Journal of Social Science and Humanities, Vol. 1 (1), pp. 1-10. DOI: 10.35370/bjssh.2019.1.1-08

Turner, T. (2004) Garden History: Philosophy and design 2000 BC – 2000 AD, Spon Press, London.

Zakaria, A.Z., Alauddin, K., Sazali, M.F., and Hassan, N. (2022), The Development Of A Malay Cultural Heritage Center: Kampung Kuchai, Ipoh, Perak, Journal of the Malaysian Institute of Planners, Vol. 20(3), pp. 63 – 75. DOI: 10.21837/pm.v20i22.1127

Zakaria, A.Z., Md Dali, M., and Hussein, H. (2019). Understanding and Interpreting the Concept Of Malaysian Garden Design: Experts Conferring. International Journal of Recent Technology and Engineering, Vol. 8 (2S11), pp. 691-695. DOI: 10.35940/ijrte.B1110.0982S1119

Zakaria, A. Z., Dali, M. M., and Hussein, H. (2020). A comparative study of the Malaysian garden concept (MGC) criteria application on the public parks. International Journal of Advanced Science and Technology, Vol. 29(7s), pp. 211-217. [online] URL: http://sersc.org/journals/index.php/IJAST/article/view/9429/5217

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TIMBER FLOORING IN TRADITIONAL MALAY AND MODERN MALAYSIAN HOMES: A STUDY OF MATERIAL CHOICES AND SUSTAINABILITY

Nurrajwani Abdul Halim[1], Imaduddin Abdul Halim[2], Afzanizam Muhammad[3], Othman Mohd Nor[4], Mohamad Hanif Abdul Wahab[5], Nor Aini Salleh[6]

[1,3,4,6]*Affiliation: Department of Built Environment Studies and Technology, College of Built Environment, Universiti Teknologi MARA(UiTM), Perak Branch, 32610, Seri Iskandar, Perak, Malaysia* [2]*Department of Building Surveying, Universiti Malaya, MALAYSIA* [5] *Centre of Studies for Interior Architecture, Faculty of Architecture, Planning and Surveying, Universiti Teknologi MARA (UiTM), Puncak Alam Campus, Selangor Branch, MALAYSIA*

*Corresponding Author: nurra546@uitm.edu.my**

Abstract: This paper explores the use of timber as a primary interior floor finish, tracing its significance from traditional Malay houses to modern Malaysian homes. Timber, a sustainable and renewable material, has been integral to Malay architecture, providing functionality and aesthetic appeal. Local species such as *kempas*, *keruing*, and *meranti* were historically used, while modern designs incorporate both local and imported varieties. This study examines the cultural and environmental importance of timber flooring, highlighting its role in enhancing interior spaces, promoting sustainability, and preserving Malaysia's architectural heritage. The findings underscore timber's enduring relevance in contemporary design and built environments.

***Keywords*:** Tımber flooring, Traditional Malay homes, Modern Malaysian homes, material, sustainability

INTRODUCTION

Timber has long been a vital material in the architectural landscape of Malaysia, particularly in the construction of traditional Malay houses. These homes, often elevated on stilts,

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featured timber flooring as a central element, serving both functional and aesthetic purposes. The design and construction of traditional Malay houses were deeply rooted in the *rumah panggung* concept, where the stilted structure not only provided protection from flooding but also facilitated natural ventilation, a critical feature in Malaysia's humid tropical climate (Rudofsky, 1964).

The *rumah panggung* design, common in Southeast Asia, was specifically adapted to the environmental conditions of tropical, flood-prone regions. Its elevated structure, typically raised 1.5 to 3 meters off the ground, served several practical purposes: it protected the house from seasonal flooding, promoted air circulation to naturally cool the interior, and prevented pest infestations such as termites. Built from locally sourced materials like hardwoods for instances *kempas*, *keruing*, and *meranti* which are often complemented by bamboo and thatch, these houses balanced durability, natural insulation, and cultural significance. Their design reflected social status and local customs, reinforcing the connection between architecture, environment, and cultural heritage.

BACKGROUND OF RESEARCH

Timber flooring has long been a significant element in the architectural design of traditional Malay houses, serving both functional and aesthetic purposes. Elevated wooden structures in these homes facilitated natural ventilation, essential for comfort in Malaysia's humid climate. Local timber species such as *meranti*, *kempas*, and *keruing* were traditionally used due to their durability and resistance to environmental factors. Handcrafted timber elements often showcased intricate designs, emphasizing cultural identity and craftsmanship (Jalaluddin, 2008; Mohamad, 2015). The natural warmth and beauty of timber contributed to the overall ambiance, creating inviting and nature-connected living spaces.

This paper explores the use of timber flooring in both traditional and modern Malaysian architecture, focusing on local species such as *kempas*, *keruing*, and *meranti*. It investigates the advantages of these materials in terms of durability, aesthetic qualities, and environmental benefits, while also considering the broader transition of timber use from traditional to contemporary interior designs.

2.1 Traditional Malay Houses and Timber Flooring

In traditional Malay houses, timber flooring played a pivotal role in the design and construction. The use of elevated timber floors was not only functional, providing ventilation and protection from moisture, but also aesthetically pleasing. Timber species such as *meranti*, *kempas*, and *keruing* were selected for their resilience and suitability in Malaysia’s humid climate (Jalaluddin, 2008; Mohamad, 2015). These hardwoods are known for their ability to withstand wear and tear, while their natural beauty added to the house's inviting and warm atmosphere.

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The integration of craftsmanship and cultural symbolism in these traditional timber floors have created living spaces that reflected local identity. The handcrafting of timber flooring was a skilled process, often showcasing intricate designs, carvings, and traditional motifs. The reliance on locally sourced timber not only promoted sustainability but also reflected the indigenous knowledge of the material's properties, contributing to the longevity of the structures.

2.2 Kempas, Keruing, and Meranti in Modern Malaysian Houses

With advancements in architecture and interior design, the use of timber flooring in Malaysian homes has evolved. *Kempas*, *keruing*, and *meranti* has remain as popular choices for flooring due to their excellent properties. These species have long been appreciated for their durability, visual appeal, and sustainability in both traditional and modern contexts (Sulong & Utaberta, 2017; Abdul-Rahman et al., 2011).

Kempas is a dense tropical hardwood native to Malaysia and Southeast Asia, known for its durability and hardness. It has a reddish-brown color that deepens with age, making it an attractive choice for interior flooring. With a Janka hardness rating of approximately 1,710, *kempas* is highly resistant to wear and impact, making it suitable for high-traffic areas (MTIB, 2023). Additionally, *kempas* is naturally resistant to termites and decay, although it benefits from extra treatment in moist environments (Mohamad & Azzawi, 2015). Its sustainability as a local species supports regional forestry industries and reduces the reliance on imported timber.

On the other hand, *keruing* is another popular tropical hardwood from Malaysia, known for its reddish to deep brown hues and coarse grain. With moderate hardness, it is suited for interior flooring in areas that do not experience extreme wear. Its weather-resistant properties make *keruing* ideal for both interior and exterior applications in humid climates like Malaysia's (Abdul-Rahman et al., 2011). Additionally, *keruing* supports sustainable forestry practices as a locally sourced material (Yuan, 1987).

Additionally, *meranti* widely used in Southeast Asia, is known for its versatility and workability. It has a range of hues from pinkish-brown to deep reddish-brown, making it suitable for various interior designs. Although softer than *kempas* and *keruing*, *meranti* remains sufficiently durable for flooring with a Janka hardness rating of around 800-900 (Sulong & Utaberta, 2017). Its wide availability and affordability make it a preferred choice for large flooring projects, and its use promotes local economies and sustainable forest management.

2.3 Transition to Modern Homes

As Malaysia's architectural landscape evolved, so did the use of timber. While traditional practices continue to influence modern construction, contemporary homes have diversified in their use of timber, incorporating advanced materials and technologies. Imported species

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like oak and cherry are now commonly used, giving homeowners a wider range of design options (MTIB, 2023). Furthermore, modern design emphasizes sustainability, encouraging the use of reclaimed and responsibly sourced timber. This trend aligns with global eco-friendly building movements, underscoring timber's ongoing role in promoting sustainable living environments.

2.4 Timber in Contemporary Design

In modern Malaysian houses, timber flooring is celebrated for its versatility, durability, and thermal properties. Architects and interior designers increasingly integrate timber into their projects, recognizing its ability to enhance the visual appeal and comfort of interior spaces. Engineered wood and composite materials, alongside traditional solid timber, allow for diverse finishes that cater to contemporary tastes, while still honouring traditional influences (Abdul-Rahman et al., 2011). This fusion of old and new reflects a broader trend in interior design that values cultural heritage alongside innovation.

RESEARCH METHODOLOGY

To investigate the role of timber in traditional and modern Malaysian architecture, this study will employ a qualitative approach. Initially, a comprehensive literature review will be conducted to gather existing knowledge on traditional Malay houses, with a particular focus on the *rumah panggung* design and its evolution over time. This review will encompass scholarly articles, architectural studies, and historical texts that illuminate the significance of timber in Malaysian culture and architecture (Loh et al., 2018; Aziz et al., 2021). By synthesizing this body of work, the research will establish a foundational understanding of timber's role in both historical and contemporary contexts.

Following the literature review, qualitative data will be collected through semi-structured interviews with architects, builders, and cultural experts experienced in traditional Malay architecture and modern design practices. These interviews will provide valuable insights into the material choices, construction techniques, and cultural meanings associated with timber use in both traditional and contemporary settings (Ismail & Rahman, 2022). Furthermore, site visits to both traditional and modern homes will be conducted to observe the application of timber flooring and construction methods in real-life contexts, allowing for a practical understanding of its usage and significance.

The qualitative data gathered will enable a comprehensive analysis of timber's role in Malaysian architecture, ultimately contributing to a deeper understanding of its cultural, functional, and environmental importance in the built environment. Through this methodological framework, the study aims to highlight the adaptability and sustainability of timber within the architectural landscape of Malaysia while honouring its cultural heritage.

FINDINGS

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The research on the role of timber in traditional and modern Malaysian architecture yielded several key findings that highlight the material's cultural significance, functional advantages, and evolving applications.

4.1 Cultural Significance and Identity

The study found that timber, particularly in traditional *rumah panggung*, serves as a crucial element of Malaysian cultural identity. Participants in interviews expressed that timber flooring is not merely a construction material but also a symbol of heritage, craftsmanship, and community values. The intricate designs and artisanal methods employed in creating timber structures reflect local customs and craftsmanship, enhancing the cultural connection to traditional architecture. The use of local hardwoods such as *kempas, keruing, and meranti* is particularly valued for their historical significance, tying modern homeowners back to their roots and traditions.

4.2 Functional Advantages

The research revealed that timber's inherent properties such as its durability, natural insulation, and resistance to humidity. Therefore, make it well-suited for Malaysia's tropical climate. The findings from the site visits indicated that elevated timber flooring promotes natural ventilation, effectively cooling interiors and reducing moisture build up. Homeowners reported that the warmth and beauty of timber flooring contribute to a comfortable living environment, creating a welcoming ambiance that enhances the overall aesthetic appeal of their homes. Furthermore, timber’s ability to withstand seasonal flooding was highlighted as a critical advantage, particularly in rural areas which prone to environmental changes.

4.3 Evolution and Modern Applications

The transition from traditional to modern architecture was characterized by a broader acceptance of diverse timber species, including imported varieties, which has expanded design possibilities. Contemporary homeowners increasingly prioritize sustainability in their building practices. The use of engineered wood, composite materials, and reclaimed timber has gained traction, aligning with global trends towards eco-friendly construction. The homeowners noted that modern designs often incorporate both traditional timber elements and innovative materials, as well as balancing functionality, aesthetics, and sustainability.

4.4 Challenges and Perceptions

Despite the numerous advantages of timber, the study identified some challenges associated with its use. Homeowners expressed concerns about the maintenance and durability of timber in areas with high moisture, such as kitchens and bathrooms. The risk of insect

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infestations, particularly termites, was another common issue cited by participants. Nevertheless, the general perception of timber remained overwhelmingly positive, with many respondents valuing its natural beauty and environmental benefits. Participants indicated a willingness to invest in regular maintenance to preserve the quality of their timber flooring, reflecting a strong commitment for maintaining traditional architectural elements.

4.5 Future Directions

The research indicated a growing interest in integrating advanced technologies and sustainable practices within timber construction. Architects and builders are increasingly exploring innovative solutions, such as incorporating smart home technologies with traditional timber designs. The findings suggest that as awareness of environmental sustainability continues to rise, the future of timber in Malaysian architecture will likely involve a blend of traditional aesthetics and modern techniques, further reinforcing its role as a vital component in both cultural heritage and contemporary living.

Overall, the findings underscore timber's enduring significance in Malaysian architecture, bridging the gap between tradition and innovation while contributing to cultural identity, functional living spaces, and sustainable building practices.

CONCLUSIONS

This paper highlights the significant role of timber in the architectural evolution of Malaysia, emphasizing its importance in both traditional Malay houses and contemporary designs. Timber, particularly local species like *kempas, keruing,* and *meranti*, serves as more than just a construction material; it embodies a rich cultural heritage while providing sustainable and durable building solutions. The unique properties of these timbers such as their weather resistance, versatility, and aesthetic appeal in order to enhance the functionality and beauty of living spaces, reflecting the deep-rooted traditions of Malaysian craftsmanship. The enduring relevance of timber in flooring systems illustrates its adaptability in meeting the demands of modern architecture while honouring the principles of sustainability and environmental stewardship. As awareness of eco-friendly practices increases, the integration of traditional materials with innovative design concepts ensures that timber will continue to thrive in Malaysia's architectural landscape. By preserving cultural identity and promoting sustainable living, the future of timber in Malaysian architecture promises a harmonious balance between heritage and modernity, contributing to resilient and culturally resonant living environments. Ultimately, timber’s role in both historical and contemporary contexts affirms its significance as a vital component of Malaysia’s architectural identity, paving the way for future generations to appreciate and innovate upon this timeless material.

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REFERENCES

Abdul-Rahman, H., Wang, C., & Saimon, R. (2011). The traditional Malay house: The embodiment of sustainable design principles. *Journal of Design and Built Environment, 9*, 1-13.

Abdul-Rahman, H., Wang, C., & Woods, P. C. (2011). Investigating the contribution of traditional Malay timber houses to sustainable construction. *Construction Management and Economics, 29*(4), 371-384.

Abdul-Rahman, H., Wang, C., Wood, L., & Kho, M. (2011). Sustainable timber practices in Malaysia: Issues and solutions. *Journal of Construction in Developing Countries*.

Aziz, N. A., Mokhtar, M. N., & Idrus, A. (2021). The evolution of traditional Malay architecture: A study of rumah panggung. *Journal of Cultural Heritage Management and Sustainable Development, 11*(3), 291-303.

Ismail, Z., & Rahman, A. (2022). Timber in contemporary Malaysian architecture: Balancing tradition and modernity. *Malaysian Journal of Architecture, 4*(1), 55-67.

Jalaluddin, J. (2008). Timber and its cultural significance in traditional Malay architecture. *Malaysian Journal of Architecture*.

Jamaluddin, M. F. (2010). The design and construction of Malay timber houses: A synthesis of structure, form, and cultural meaning. *Journal of Architecture and Planning Research, 27*(3), 201-213.

Loh, K. W., Chai, S. H., & Lee, Y. W. (2018). Architectural heritage of Malaysia: An overview of traditional building techniques and materials. *International Journal of Heritage Studies, 24*(6), 624-640.

Malaysian Timber Industry Board (MTIB). (2023). Hardwood species in Malaysian construction. *MTIB Publications*.

Malaysian Timber Industry Board (MTIB). (2023). Timber species. Retrieved from https://www.mtib.gov.my

Mohamad, H. (2015). Craftsmanship and identity in Malay timber architecture. *Journal of Southeast Asian Studies*.

Mohamad, H., & Azzawi, N. (2015). Environmental benefits of using local timber in construction. *Journal of Environmental Architecture*.

Mohamad, H., & Azzawi, S. (2015). The significance of timber as a sustainable building material in traditional Malay architecture. *Asian Journal of Environment-Behaviour Studies, 1*(1), 23-32.

eISSN 3030-5543

Moxon, S. (2012). Timber: A sustainable building material. *Building Design and Construction Journal*.

Rudofsky, B. (1964). *Architecture without architects: A short introduction to non-pedigreed architecture*. University of New Mexico Press.

Smith, D. (2021). Challenges and benefits of timber flooring. *International Journal of Interior Design*.

Sulong, N. H. R., & Utaberta, N. (2017). Timber as sustainable material in modern Malaysian house construction. *Procedia Engineering, 180*, 875-882.

Sulong, N. R., & Utaberta, N. (2017). Traditional Malay house construction and its influence on modern architecture in Malaysia. *International Journal of Built Environment and Sustainability, 4*(3), 150-157.

Sulong, Z., & Utaberta, N. (2017). Modern applications of traditional timber in Malaysian architecture. *Journal of Sustainable Design*.

Yuan, L. (1987). *The Malay house: Principles and implications*. Penerbit Universiti Sains Malaysia.

Yuan, Y. (1987). Wood species and their properties in Malaysian construction. *Forest Research Institute Malaysia*.

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THIRD SPACE TRANSFORMATION: THE ARCHITECTURE OF "KEUDE KUPHI" AS A REFLECTION OF SOCIAL CHANGE IN ACEH

Marisa Hajrina[1*], Zuraihan[1], Fitri Muliani[1], Ulil Fahmi[2]
[1]Universitas Almuslim, Bireuen, Aceh,
[2] PT Aditya Mandiri Sejahtera, Depok, Jawa Barat

**marisa@umuslim.ac.id*

Abstract: One of the social institutions in Acehnese society that is difficult to separate in daily life is the culture of drinking coffee in coffee shops or 'Keude Kuphi'. This has created a local wisdom for the people of Aceh in socializing and interacting in the Third Space. Coffee shop users used to be visited only by men, but now this is no longer the case, because all groups of men and women, from adults to children, often go to coffee shops. This situation explains that coffee shops are not only a place to stop by to get information and enjoy a cup of coffee, but as a meeting place with various other activities. Therefore, along with the times, coffee shops have become one of the factors of social change in society towards the adaptation of spatial design in particular. This research uses a descriptive qualitative method, which focuses on discussing the space design of traditional coffee shops to modern coffee shops. Thus, it is expected that this research can be known that the transformation of the Third Space in the design of the coffee shop space, has a role as a reflection of social change in Aceh, especially Banda Aceh City.

***Keywords*:** Third Space, Coffee Shop, Space Design, Transformation.

INTRODUCTION

The Third Space is an intermediate space, in the form of the First Space (residence) and the Second Space (workplace), which is used as a place to socialize and communicate informally to unwind from daily activities (Bachtiar F et al., 2023). This space, can fulfill the basic human needs for gathering and expression which certainly has a comfortable feel for its users. This concept was first introduced by Oldenburg (1989) in Bachtiar F et al., (2023), where the Third Space has the following characteristics:

1. Neutral, where visitors can freely access the space without restrictions and the burden of having to host.
2. Equal, where the space provides opportunities for all groups and segments of citizens to be able to enjoy it.
3. Active communication, where conversation is the main activity that occurs and is done in a casual, informal fun, and relaxed manner.
4. Ease of access, where the Third Space can be easily accessed all the time and makes it easy to return/visit regularly.
5. Regularity, where the space has a group/community that regularly uses it so that it creates a distinctive attraction and feel.
6. Low Profile, the atmosphere tends to be simple, not prominent.
7. Playful, where the mood that arises is generally fun, and relaxed and does not touch on formal matters.
8. It Feels like home, where the third room gives a familiar impression, feels like home.

Based on the explanation above, the Third Space in its basic form is a simple space which means that it is comfortable, pleasant, and dominated by informal interactions of its visitors. Observations of this phenomenon are mostly in the context of spaces such as coffee shops.

The existence of coffee shops today is a worldwide phenomenon because it can be easily found, especially in Indonesia. The history of origin of coffee shops in Aceh is a Dutch initiative involving traders of Chinese descent, by creating a gathering place for Acehnese people to be easily controlled by the Dutch in controlling Aceh (Akmal & Fairusy, 2018). This certainly aimed to make the Acehnese people off guard against resistance to the Dutch at that time. However, it was not that easy, even the coffee shop became a meeting place to discuss war strategies before the resistance to the Dutch was launched, this is in line with what a National Hero Teuku Umar said "*Beungoh singoh geutanyoe jep kupi di keude Meulaboh ataw ulon akan syahid*", which means tomorrow morning we will drink coffee in Meulaboh or I will die (Malau, 2017). Explaining that coffee shops are part of the Acehnese culture that has been going on for a long time as a space for gathering and discussion while enjoying coffee.

In the past, coffee shops or called Keude Kuphi both individually and in certain social groups were visited by the majority of men only (Putra & Ekomadyo, 2015). Similarly, according to Akmal & Fairusy (2018), coffee shops can only be visited by men, because if there are women in coffee shops, they are considered inappropriate or misbehaved. But now this is no longer the case, coffee shops are freely visited by productive people consisting of men and women, from adults to children. This explains that coffee shops are not only a place to stop by to get information and enjoy a cup of coffee but as a meeting place with various other activities.

The tradition of gathering or *silaturrahmi* in Acehnese society at coffee shops can be seen in the proliferation of coffee shops, especially in the city of Banda Aceh. So that the phenomenon of the land of a thousand coffee shops is not found anywhere else, because coffee shops are central in various activities of most people in Aceh (Akmal & Fairusy, 2018). Therefore, along with the times, coffee shops have become one of the factors of social change in the community towards the adaptation of space design from traditional coffee shops to modern coffee shops.

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Regarding the discussion of the Third Space transformation in coffee shop space design, the author will take two coffee shops as case studies, namely Solong Coffee Shop and Grah. The coffee shops mentioned above are distinguished between traditional and modern coffee shops, which have different characteristics and concepts in meeting the needs of their users. This can be seen in the division of zones contained in the spatial arrangement of coffee shops. This research aims to find out what are the influences and adaptations of space design in coffee shops as a reflection of social change on user comfort. Because, comfort is the category with the most frequency representing the sentences of visitors who want a coffee shop that is clean, comfortable, well aired, sufficient lighting, not hot, cool room temperature, and cozy.

METHODS

A descriptive qualitative method in a case study was used as part of the analysis approach in this research. Then, direct observation of the object of research related to the characteristics and concepts of space design in coffee shops, which is used to collect data on how the influence and adaptation of space design in coffee shops as a reflection of social change on user comfort.

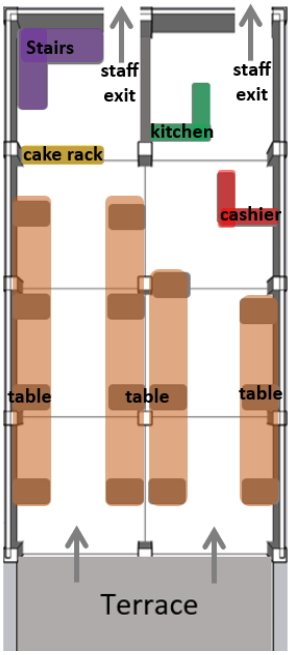
CASE STUDY: BANDA ACEH COFFEE SHOP

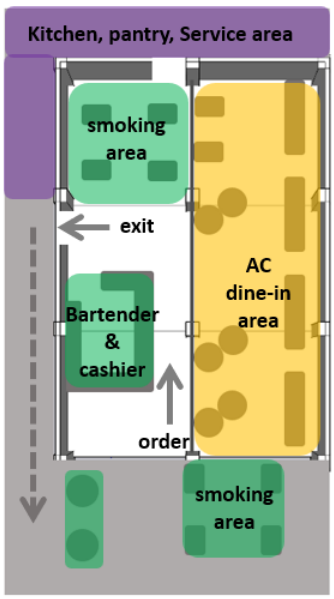
This research will take two coffee shops as case studies, namely traditional and modern coffee shops, which are studied based on the characteristics of form, material and decoration in traditional coffee shops and based on flexibility, aesthetics, connection and experience in modern coffee shops. While the concept of space design is based on involvement, intimacy and freedom in the Third Space as a reflection of social change, namely:

1. Solong Coffee Shop, located in the middle of Banda Aceh City in the Ulee Kareng Subdistrict area adjacent to the Ulee Kareng market complex, is one of the oldest coffee shops in Banda Aceh City, because it was established before the Tsunami in 1974 and still survives today (Hikmah NU, 2017).
2. Grah Coffee Shop is a contemporary coffee shop, located in Banda Aceh City with a distance of about 1.4 km and 4 minutes from Jl. Teuku Iskandar with Warrung Kopi Solong. This coffee shop started operating from 2021, with a relatively new coffee shop but crowded with visitors.

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ANALYSIS & DISCUSSION

No.	Variabel	Data	Information
Solong Coffee Shop (traditional)			
1.	Characteristics	- Open from 06.00-23.00 WIB. In the service system, visitors look for a seat that is still available and the waiter will come with a menu book and notes. Then, wait for the order to be delivered at the same time with snacks in the form of cakes, so that the order is paid later before the guest goes home.  	- The shape, simple building reflects the characteristics of traditional coffee shops in general in Aceh. At first glance, it seems narrow. The shape of the space that is limited by walls, floors and ceilings gives a sense of protection, with interpretations that arise can arise the impression of space, but also can arise the impression of narrowness (Angkouw R and Kapugu H, 2012). - The materials used are 30x30 ceramic tiles on the floor and 20x20 on some walls. Patterns made in the arrangement of floor covering materials (ceramic, marble, granite etc.) will improve the quality of a space (Angkouw R and Kapugu H, 2012). - Decoration and Color, there is no striking decoration in this coffee shop, it looks very simple, even though it can have a psychological effect on users, where color also has a very important role in creating a spatial atmosphere (Harmoyo HL et al., 2021).
2.	Space Concept		- Involvement, in this coffee shop is only dominant for men, this is in accordance with the Acehnese cultural context in the past, Keude Kuphi both individually and in certain social groups is visited by the majority of men only (Putra & Ekomadyo, 2015). - Familiarity, not visible in the atmosphere, but the social interactions and conversations from one of the communities were clearly visible. - Freedom, seen in the space related to the arrangement of furniture with a repeating pattern that follows the walls and center column, which facilitates the circulation of visitors to determine the place. Furniture used to achieve

No.	Variabel	Data	Information
			the same purpose is united into one functional group, which must still be well organized, so that there is still circulation space available (Angkouw R and Kapugu H, 2012).
Grah Coffee Shop (Modern)			
1.	Characteristics	- Operating hours start from 07.00-23.00 WIB. The service system, visitors order the menu first, pay and find a seat and wait for the order to be taken by themselves to the bartender. The management of this coffee shop is modern with an independent service system. 	- Flexible, a variety of activities are clearly visible from this coffee shop, whose users are dominated by young people, who like freedom, and this is also seen from the arrangement of furniture by giving distance, giving the impression of privacy and good circulation, and the separation of space provides user comfort from pollution. Furniture used to achieve the same purpose is united into one functional group, which must still be well organized, so that circulation space is still available (Angkouw R and Kapugu H, 2012). - Aesthetics, related to the aesthetics of this building is quite interesting, with the shape of the building looking dynamic with a combination of symmetrical patterns and the use of glass materials that give a broad impression. The shape of the space that is limited by walls, floors and ceilings gives a sense of protection, with interpretations that arise can arise a broad impression, but can also arise a narrow impression (Angkouw R and Kapugu H, 2012). - Connection, of course, an equally important attraction for users, especially young people, at modern coffee shops is a stable internet connection. Similarly, the connections between spaces are well organized with clear circulation. - Experience, referring to the design of the outside and inside of the building which is already quite

No.	Variabel	Data	Information
			attractive, then of course there is a different experience felt by users, when compared to traditional coffee shops. Especially in the chosen color concept. According to the Department of Education and Culture 1991, colors are shades such as green, yellow, and so on. In the color application of the Grah coffee shop there is the use of green at the ordering table, in the design of a space can have a psychological effect on users (Chressetianto A, 2013).
2.	Space Concept	 	- Involvement in these coffee shops is very warm, this happened after the 2004 tsunami, when the visit of thousands of volunteers who brought colorful cultural backgrounds gave a new feel (Akmal & Fairusy, 2018). So that women freely visit coffee shops, of course, by considering the comfort of its users. - Familiarity, also seen in the cozy and familiar atmosphere encourages social interaction and conversation. - Freedom, seen in the space that is blocked using glass material, so that users can access all areas of the room and seem spacious with a limited area. Then, the location of furniture by giving distance, gives the impression of privacy and good circulation, and the separation of space provides user comfort from pollution. Furniture used to achieve the same purpose is united into one functional group, which must still be well organized, so that there is still circulation space available (Angkouw R and Kapugu H, 2012).

CONCLUSIONS

This research shows that the characteristics and concept of space in coffee shops in Aceh, especially in form, material, decoration, flexibility, aesthetics, connection, and experience are different in the concept of spatial arrangement of coffee shops, which greatly affects the

experience and behavior of visitors. For example, Solong Coffee Shop in its furniture arrangement with repetitive patterns that follow the walls and center column, can facilitate the circulation of visitors to determine the position of the place. Meanwhile, Warung Kopi Grah gives the impression of a large space with its symmetrical pattern and glass material. The use of colors such as green in Grah Coffee Shop also gives a certain psychological effect to visitors. Overall, space design affects not only the physical comfort, but also the mood of visitors, which impacts on how they interact and enjoy the space. This emphasizes the importance of space design in creating a Third Space that supports social interaction and reflects social change in Aceh.

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REFERENCES

Bachtiar, F., et al. (2023). Kesesuaian Ruang Publik Di Dki Jakarta Sebagai Ruang Ketiga Di Era Digital. *Jurnal Arsitektur, Bangunan, & Lingkungan*. Vol.12 No.2, 143-154.

Putra Riza, A dan Ekomadyo Agus, S. (2015). Interpretasi Makna Pada Warung Kopi Aceh Studi Kasus: Warung Kopi Solong Di Banda Aceh. *Atrium - Jurnal Arsitektur*. Vol. 1, No. 1, 1-10.

Angkouw, R and Kapugu, H. (2012). Ruang Dalam Arsitektur Berwawasan Perilaku. *Jurnal Media Matrasain* Vol 9 No 1.

Chressetianto, A. (2013). Pengaruh Aksesoris dan Elemen Pembentuk Ruang terhadap Suasana dan Karakter Interior Lobi Hotel Artotel Surabaya. *Jurnal Intra* Vol. 1, No. 1,1-7

Malau, M. C. (2017). Teuku Umar, Kopi, dan Kisah Taktik Dua Rupanya. https://daerah.sindonews.com, akses 10 Oktober 2024.

Hikmah, N.U. (2017). Strategi Komunikasi Bisnis Pada Warung Kopi Solong Ulee Kareng Kota Banda Aceh. *Jurnal Al-Bayan*/ VO. 23. NO.1

Dhillon J. K., et al. (2007) Pengaruh Elemen Interior terhadap Kenyamanan Pengunjung Kaitannya dengan Gaya Hidup Modern di Ardent Cofee Pesanggrahan Jakarta Barat. Program Desain Interior,Fakultas Seni Rupa dan Desain, Universitas Tarumanagara.

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CONCEPT OF POSI: SYMBOL AND SACRED SPACE OF LUWU ARCHITECTURE

Moh. Sutrisno[1*], Wasilah Sahabuddin[2]

[1,2]Affiliation: Department of Architecture, Science and Engineering Faculty, Alauddin State Islamic University Makassar, Gowa, South Sulawesi, INDONESIA

Corresponding Author: moh.sutrisno@uin-alauddin.ac.id

Abstract: Chiefdom buildings, Langanae, Salassae, places for making weapons, places for valuable and historical items, and mausoleums have important values in the Islamic architectural civilization in Tana Luwu. Lokkoe is one of the Luwu Chiefdom areas filled with mausoleums (king's tombs). The typology of the mausoleum building is unique and has relationships with similar objects in other areas in South Sulawesi. Syntactic relations exist between the chiefdom building, the Luwu chiefdom palace complex gate, and the Lokkoe gate. However, the Lokkoe Area authorities allowed the chiefdom's mausoleum to appear unkempt, unsacred, and unsafe. The research uses qualitative methods with a symbolic interactionism paradigm. The research results show that Lokkoe Architecture is representative. The Lokkoe area is a tana tekko area, which is the upper layer and sacred space in the urban space layer. The Lokkoe area has symbols of social strata manifested by the gate and the unique shape of the mausoleum. The center of space symbolically forms the structure of space and cosmological symbols. Lokkoe and its context have a syntactic relationship with similar tombs in South Sulawesi, while the chiefdom context tends to be related to Malay architecture in the archipelago. Lokkoe architecture has the potential to become an architectural icon like the Taj Mahal. It can become a cultural tourist attraction in Tana Luwu, South Sulawesi, Indonesia, and the archipelago.

***Keywords*:** Mausoleum Architecture, Luwu Architecture, Malay Architecture, and Archipelago Architecture

INTRODUCTION

Palopo has many historical codes that determine its architectural richness, consisting of cultural and historical artifacts. The text "toddopuli temmalara" is written, and the hand holds a badik as a symbol of what it wants to convey to anyone who sees it. It was found at the Palace Monument. The large tombstones in the south and west are the city's physical boundaries (Mahmud, 2013). Mahmud firmly stated that the fact that the tombstones were

still there in Palopo showed that there were thoughts about tribal relations and the mysterious attitudes of the Palopo people. Headstones are considered to radiate ancestral spirits; large tombstones have always been artifacts of the city, and its residents guard them safely. The city's culture and human powers may still be embedded in mystical thinking. Socio-mystical space is considered to shape the identity of urban space.

The philosophical phenomenon of the crisis of form and meaning is a unique challenge in the design of architectural works. Appropriate methods and paradigms are needed to discover the meaning of Palopo's ancient buildings. In other words, different perspectives are needed on certain things, such as mosque pillars as the center of the city and the world. Tombs tend to be related to palaces and vice versa. However, because the tomb was in an unclear period, the architectural form of the tomb became important to research.

1.1 Civilization and architecture

According to Koentjaraningrat (2000), culture has three aspects: ideas, actions, and works. The first component comprises ideas, thoughts, and norms (Koentjaraningrat, 2000). The first part shows objects that are unclear (abstract) and contained in the thoughts of the citizens who create culture. The second part consists of a series of community activities and behaviors. The second form of culture is more related to patterned human activities and actions, known as social systems. The third aspect is human-made objects, which are human-made objects or artifacts that can be seen, touched, and documented in the form of images.

Civilization is part of culture. Civilization is a concrete manifestation of human thinking ability realized in developing sophisticated science and technology (Yatim, 2016). Behavior is inherited through symbols and includes cultural objects. Past identities create unity and diversity as identities so that they can become national identities. Even in his view, Adams emphasized that historical heritage objects have the potential to become icons (Adams, 2015). Several historical heritage sites in Luwu land have become icons of Palopo (Sutrisno, 2023).

RESEARCH METHODS

Chalmers stated that science is built from facts (Chalmers, 1983). To gain knowledge, researchers use the most traditional rules, namely the study of symbols—the unique symbols of the buildings and spaces of Palopo in Luwu land. One object is related to another object.

The researcher applied symbolic interactionism originating from Blumer's thinking. This methodology departs from social phenomenology developed by Schutz (Crozier et al., 1994). Using the phenomenological paradigm, researchers obtain an integrated relationship between architecture and cities (Sutrisno et al., 2020). The relationship is *self-from-home,* which comes from the order of the building and space, the function and conditions of the building, as well as the materials and form, all of which will form 'character.' Norberg-Schulz understands architecture as an existence between character and space. Meanwhile, for Mead, concepts are obtained from people's meanings of objects (Mead, 2018). A person's readiness

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to sit on and use a chair will be different between people familiar with seating compared to people with no experience with chairs.



Figure 1: Zones and relations between the Tana Tekko Place and the Luwu Chiefdom Palace Area.

Researchers divide zones into areas (figure 1). The selection of building objects is based on the character of the building, which indicates it is a heritage building. Meanwhile, building objects are determined based on previous research data and information from sources after carrying out the snowball method process. In the analysis, the researcher uses a semiological paradigm. As done by Parsaee, semiological studies can decode form and meaning content by investigating space and place concepts (Parsaee et al., 2015).

DISCUSSION AND RESULT

Researchers carry out symbolic interactions with space users and objects related to space users. Not only in the context of symbolic interactions between users and objects, but there is also meaning in symbolic relationships between one building and another. Langanae Palace (see picture 2, left) represents architectural works in Luwu land.

The shape of other buildings is similar to the shape of Langanae. As another object, the house of the Bassesangtempe or Bastem people (see Figure 2, right) has similarities with Langkanae.

Table 1: Syntactic relations between buildings in Luwu

Object	**Linking Aspect Object**
Tana Bangkala – Tana Tekko	Residential complex – Lokkoe tombs complex
Lokkoe – Langkanae	Langkanae Datu family grave – Datu residence Lokkoe
Lokkoe - Salassae	Datu family grave- Datu official residence
A place to make Kawali (dagger)	Same sacred object
A place for valuables	Same sacred object
Lokkoe and domed tombs in South Sulawesi	Same sacred object

Source: Sutrisno (2024)

The location of Bastem's house as the research object is in Palopo City; as residents of Luwu, the Bastem people occupy the area between Palopo City and Tana Toraja. Access to the residential areas of the Bastem community is quite tricky. However, with building replicas that represent two different cultures, the basstem house is categorized as a typical adaptive object. The shape of the Bastem house is a combination of Bugis Luwu and Toraja architecture. As stated by the informant, Luwu's territory extends to the Poso area. Twelve traditional figures show symbols of diversity in the chiefdom and Luwu land area. \



Figure 2: Figure of Luwu House

Source: Sutrisno (2017)

Traces of the struggle are stored secretly in the Batara Guru Museum and Building. The function of space in the Batara Guru Museum shows diachronic and synchronic relationships. In the context of gates, it means layers of space. The layers of space are most prominent in architectural works. The function of space is divided into two categories, namely, space used by humans and space not occupied. The concept of change symbolizes the interconnectedness of form and history. Diachronic relations show the diversity of the

meanings of vengeance toward Palace residents who moved from Datu Andi Kambo to Datu Andi Maradang Mackulau. Historical symbols are preserved in the Salassae Middle Room and the Batara Guru Museum.



Figure 3: Luwu Chiefdom Palace Gate

Source: Sutrisno (2017)

There is a relationship between the shape of the gate and the surrounding buildings; this can be seen in the Palopo Old Jami Mosque building, likewise, with the mihrab in old mosques and the mihrab in Malaysia (figure 4) in the context of diachronic meaning. The gate is a reference that can emphasize symbolic signals. A mosque with a tiered roof has a metaphorical meaning, namely mahameru. The facade of the Langkanae gate is an example of not only new buildings but also old buildings.



Figure 4: Syntactic relationship between the form of the Palopo Jami Mosque and the pulpit at the N.I.K. Rasidin Academy in Kelantan, Malaysia.

Source: Sutrisno (2024).

As cultural heritage buildings, Langkanae and other elements in the area set a precedent. An example is the protruding facade at the gate, including fence elements that resemble the shape of a tongkonan or the gable roof of a traditional house. The Ministry of Tourism, Art, and Culture in Malaysia (M.O.T.A.C.) makes building objects such as mosques as iconic architecture because it has solid historical meaning and a building style that can represent the modernity of the country as well as in an aesthetic aspect (Utaberta & Shakir, 2021).

3.1 Chiefdom areas as central objects

The chiefdom area is sacred in the central part of Palopo. Daily, the Luwu chiefdom area looks quiet and deserted. One architectural object and another tend to have similar shapes and typologies. The structure of Langanae and the blacksmith's gazebo is similar. On the other hand, architectural objects not only have similarities but also have contradictory forms. The different objects are Langkanae and Salassae. Both dominate the Luwu chiefdom area.

In the cybernetic concept, one object is related to another in terms of physical and symbolic relations. Meanwhile, in semiotics, all objects in the Luwu palace area have meaning. Symbolically, the road becomes a barrier between the function of the chiefdom as a space for traditional governance and the function of education. Thus, the road fulfills a barrier function in addition to the function of vehicle circulation.

3.2 Langkanae as a form analogy

In the context of form, language becomes a replica in the making, *just say* for the gate. This is true not only for the gate of the palace area but also for the gate of the king's burial area. In the palace cemetery area, there is 1 point for the gate, while in the palace area, there are 2 points. In the context of semiotics, the palace gate is a replica of the gate to the Tomb Area.

Pragmatic meaning is the meaning of a building that is felt by building users. Datu Luwu has been a building user since the Langkanae building was rebuilt. The new building in Langkanae can be used as an analogy for other buildings in the city of Palopo and in the Tana Luwu area. The Langkanae building also has a syntactic relationship with buildings in North Luwu Regency, Luwu Regency, and East Luwu Regency.

3.3 Place of manufacture of weapons

Quality of Life tends to appear in the palace surroundings of the Luwu chiefdom. During initial data collection (in 2017), researchers observed the process of making kawali weapons in the Luwu chieftaincy palace. Every palace resident's quality of life is visible when welcoming guests and interacting with various needs. However, in the last observation (in 2023), researchers found no more places where Kawali weapons were made. Visitors and guests will find a weapons-making place when you first enter the palace area. The users of the room where the weapons were made were Opu Patunru, a blacksmith and chieftaincy servant. Opu

Patunru and Kawali represent symbols of security and tools for security, which are always sustainable weapons.

The place to make weapons is between the Langkanae Building and the Salassae Building. It is located in the middle of the palace area. Apart from being a strategic location, the place for making weapons is also a gathering place, interaction between space users, and monitoring the security of the palace environment.



Figure 5: Interaction of Kawali weapons makers in the Central room

of the Luwu Chiefdom Palace complex

Source: Sutrisno (2020)

3.4 Where to Store Weapons and Arajang

The symbol of sacredness is represented by the space and place in storing heirloom objects (Sutrisno et al., 2020). Visitors need help to enter the Arajang room. Arajang is a secret room in a building. The 40th Datu of Luwu, Andi Maradang Mackulau Opu to Bau, did not always occupy Salassae. Thus, some officers maintain the security of the palace environment, including the arranging room. The palace requires a special ceremony to see Arajang. This shows the sacredness of the special space, and Arajang is very high. Arajang and spaces in other buildings, such as post offices, are also similar.

Luwu's typical weapon is known as Kawali (Sutrisno, 2017). Kawali has sacred values that resemble Arajang. Spatial actors refer to the indexicality of objects. The sacredness of Kawali and Arajang refers to private characters that are magical and sacred. Another object that has higher hierarchical and symbolic value is the *doke pack*. These objects are essential in every traditional ceremony within the chiefdom's palace. Regarding frequency towards weapon owners, Maka Arajang always remains in its place, whereas *doke pack* and *frying pan* always follow its owner. Form *Doc Pakka* has two branches, while Kawali has unbranched ends.

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3.5 Islamic burial places for royal descendants

The Tana Tekko area is located in the city's northern zone. A river separates the Lalebbata area and the Tana Tekko area. Tana tekko is a spatial structure in Palopo that is sacred in nature. The burial of the royal family represents the sacred relationship between Tana Tekko and the Luwu Chiefdom. In the local language, it is called *matrinoe,* or a sacred bed, as is the tomb of an Islamic king.



Figure 6: The relationship between the gate and Lokkoe Tomb

Source: Sutrisno (2020)

Officers guard the Lokkoe burial complex from the Palopo city parks and plantations department. Officers carry out maintenance and supervision. Maintenance of fence elements and cemetery buildings by painting. The size of the Tata Tekko area and the tomb gate are not closed during the day, so several types of residents' pets are entering the Tana Tekko area. This problem will become an object of exploration and a recommendation to the Luwu chiefdom's palace in planning and preserving cultural sites. Apart from the palace as a private sector, which is directly related to customary aspects, there is also the Government, which the Palopo City Parks and Plantation Service represents. There is potential that needs to be developed as a core zone or buffer zone because the city of Palopo is a city that has much cultural heritage.

The kings' tombs are located in the corner of the burial area. The plan shape of the tomb is rectangular. The entrance is from the South. The shape is not the same as the shape of the gate. The Lokkoe gate is a link to the Luwu chiefdom complex style.

Meanwhile, Lokkoe is related to the era of architectural civilization and syntactic relations with other tombs in South Sulawesi. Dome-shaped tombs in the South Sulawesi region were intended for Islamic figures (Sutrisno, 2023). In the context of eating as a Mausoleum, Lokkoe has the same role as a building like the Taj Mahal. The distribution of Islamic tomb buildings in South Sulawesi is influenced by Persian culture (As, 2018). Thus, there will be regional relations within South Sulawesi's scope if similar tourism objects are mapped.

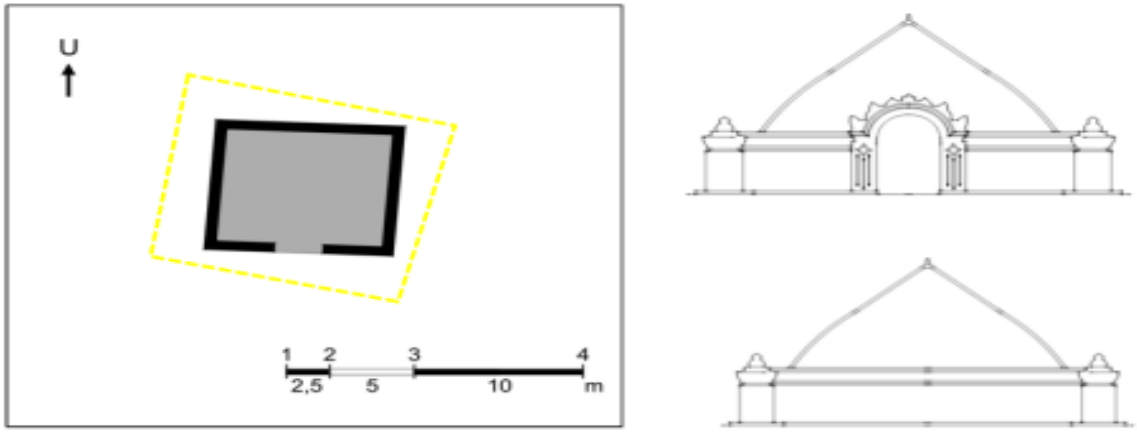


Figure 7**:** Plan and appearance of Lokkeo after redrawing

Source: Sutrisno (2020)

CONCLUSIONS

The relationship between buildings can provide suggestions and recommendations to the city Government regarding the flow of cultural attractions. Even for certain groups, related objects can be grouped in one cultural heritage building core zone. The history of South Sulawesi records that the Luwu community groups have levels that are symbolized by the shape of the building. The social strata of society form architectural relationships not only in buildings but also in layers of cosmological space. A detailed exploration of spatial layers finds symbols of social strata through roof shapes, building elements, and building types. It is revealed through the interactions of traditional figures from the Luwu chiefdom. The center of space at macro, meso, and micro levels is structured and cosmos. Lokkoe architecture represents sacred space in the Tana Tekko spatial layer. Lokkoe architecture has the potential to become an architectural icon like the Taj Mahal and can become a cultural tourist attraction in Palopo City.

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REFERENCES

Adams, K. M. (2015). Identity, Heritage, and Memorialization: The Toraja Tongkonan of Indonesia. *Writing Material Culture History*, 93–100.

As, C. (2018). Indications of the Influence of Persian Culture in South Sulawesi: Islamic Archaeological Studies. *Jurnal Walennae*, *16*(2), 135. https://doi.org/10.24832/wln.v16i2.318

Chalmers, A. F. (1983). *What is called Science?* Hata mitra.

Crozier, G., Denzin, N., & Lincoln, Y. (1994). Handbook of Qualitative Research. In *British Journal of Educational Studies* (Vol. 42, Issue 4). Sage Publications. https://doi.org/10.2307/3121684

Koentjaraningrat. (2000). *Introduction to Anthropology*. Rineka Cipta.

Mahmud, I. (2013). *Palopo Ancient City: Physical, Social and Cosmological Dimensions*. Masagena Press. Mead, G. H. (2018). *Mind, Self, and Society: From the Stand Point of A Social Behaviorist (in Indonesia)*. Forum (Core Media Relations Group).

Parsaee, M., Parva, M., & Karimi, B. (2015). Space and place concepts analysis based on semiology approach in residential architecture. *HBRC Journal*, *11*(3), 368–383. https://doi.org/10.1016/j.hbrcj.2014.07.001

Sutrisno, M. (2017). Text Design As Icon and Culture Representation. *1st ICON-ARCCADE 2017 (International Conference on Art, Craft, Culture and Design)*.

Sutrisno, M. (2023). Tracing Persian Influences: Exploring The Meaning of Mosques and Mausoleums in South Sulawesi as Iconic Islamic Architecture. *Journal of Islamic Architecture*, *7*(4), 669–679.

Sutrisno, Moh., Sudaryono, S., & Sarwadi, A. (2020). *Concept Position: The Spatial Significance of Palopo Old Town*.

Utaberta, N., & Shakir, H. J. (2021). Design Framework For Ablution Spaces of Iconic Mosques In Malaysia. *Journal of Islamic Architecture*, *6*(4), 251–263. https://doi.org/10.18860/jia.v6i4.11702

Yatim, B. (2016). *History of Islamic civilization: Dirasah Islamiyah II*. PT Rajagrafindo Persada.

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THE IMPACT OF PUBLİC ART ON TOURİSM AND COMMUNİTY ENGAGEMENT İN PEKAN PARİT, PERAK

Muhamad Ferdhaus Sazali[1] & Nur Ayunni[2]
[1&2]Programme of Town and Regional Planning, Department of Built Environment Studies and Technology, College of Built Environment,
Universiti Teknologi MARA, Perak Branch, Seri Iskandar Campus

*Corresponding Author: ferdhaus@uitm.edu.my**

Abstract: This study explores the role of public art in promoting tourism and community engagement in Pekan Parit, Perak, a small Malaysian town with a rich cultural heritage. Public art, encompassing murals, sculptures, and installations, offers an avenue for preserving cultural identity, enhancing urban aesthetics, and revitalizing local economies. However, challenges in maintenance, community participation, and sustainable integration hinder its full potential. This mixed-methods research investigates the current state of public art in Pekan Parit, its impact on residents and tourists, and the potential for improved engagement and conservation. We collected data through surveys with 103 residents, supplemented by site observations to assess awareness, perceptions, and preferences regarding public art initiatives. Despite the widespread recognition and value of public art for its aesthetic and cultural significance, challenges arise due to maintenance issues and limited public involvement. The study emphasizes the need for structured public art master planning that includes diverse stakeholders, ensuring that art installations contribute to both cultural preservation and tourism development. Recommendations include establishing maintenance protocols and promoting public art as a tool for community pride and identity, creating an integrated approach to heritage conservation and urban development in Pekan Parit.

***Keywords*:** Public Art, Cultural Heritage, Community Engagement

INTRODUCTION

Public art, a multifaceted concept with evolving interpretations, is generally regarded as any artwork displayed in public spaces, from murals and graffiti to statues and monuments. It functions not only as a form of aesthetic enhancement but also as a platform for social,

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cultural, and political expression. Public art brings art outside formal gallery walls, engaging people in everyday environments (Hunting, 2005). In this study, "public art" refers to artistic works created collaboratively by recognized artists and community members, showcased in locations accessible to the public. Urbanization has spurred new architectural and cultural expressions, especially in areas with rich histories such as Perak, Malaysia. As cities and towns develop, public art becomes an essential element in defining the cultural landscape, creating a visual dialogue that interacts with local identity, heritage, and community values. In Pekan Parit, Perak, the integration of public art has introduced new points of interest, yet there is ongoing debate regarding its role and appropriateness within historically sensitive areas. Concerns are often raised over how adaptive modifications might compromise heritage, as seen in previous studies which argue that inappropriate adaptation of historical sites can diminish their cultural integrity (Jasmi & Mohamad, 2016). The drive to cultivate art appreciation within communities is growing, with public art seen as a mechanism for uniting residents and fostering cultural pride. This study will explore how public art can serve as a vehicle for community involvement, evaluating public and artistic perspectives on its role in adaptive reuse. Such perspectives can shed light on public art's role in preserving local history while also encouraging creative cultural experimentation. Pekan Parit, with its historical value and ongoing modernization, presents a unique case for examining these dynamics, as the region seeks to balance heritage conservation with urban renewal.

In Malaysia, smaller towns like Pekan Parit often struggle to attract tourists and businesses, largely due to a reduction in cultural and creative offerings that characterize larger cities. Public art has the potential to transform such towns, revitalizing them into culturally rich, vibrant spaces that attract both residents and visitors (Jasmi & Mohamad, 2016). However, challenges remain in managing community involvement, gaining approval for art projects, and ensuring accountability for maintaining these artworks. Given these concerns, there is a need to explore structured approaches for integrating public art in small towns, fostering partnerships between artists and community members, and celebrating local heritage through creative expression. In Pekan Parit, the role of public art as a driver for economic and community revitalization is complex. While urbanization has brought new architectural developments, it also raises concerns about preserving the cultural identity tied to historical townscapes. Furthermore, without effective maintenance, public artworks risk degradation, with faded colors and deteriorating structures compromising their impact. This study seeks to address these issues by examining the status, impact, and potential improvements for public art in Pekan Parit.

LITERATURE REVIEW

Public art has long been recognized as a vital component of urban development, widely acknowledged for its role in enhancing the aesthetic and cultural dimensions of public spaces. Public art can serve as a visual narrative that reflects the history, culture, and identity of a place, contributing to a sense of belonging among residents and offering an authentic experience to visitors (Miles, 1997). The integration of public art into tourism strategies has gained traction, particularly in regions seeking to differentiate themselves in a competitive

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market. The broader concept of cultural tourism, which leverages a place's unique cultural assets to attract visitors, aligns with this approach (Richards, 2018). Research by Mathews (2014) highlights the transformative potential of public art in revitalizing declining urban areas. Public art installations can attract tourists, generate media attention, and stimulate economic activity by creating vibrant public spaces that encourage social interaction. This is particularly relevant in small towns like Pekan Parit, where tourism is a crucial driver of economic sustainability.

The success of public art in such contexts, however, hinges on the degree of community involvement and acceptance. McCarthy (2006) noted that the community is more likely to embrace public art that resonates with local values and identity, thereby enhancing its appeal to tourists. The literature also explores the critical aspect of public art's role in fostering community engagement. According to Cartiere and Willis (2008), public art can act as a medium for social dialogue, bringing diverse groups together and fostering a sense of collective identity. Utilizing social practice theory, we can further understand how public art engages communities and promotes collaboration, which is particularly important in multicultural societies. Here, public art can bridge cultural divides and promote social cohesion. Such engagement can enhance the visitor experience in tourism by providing deeper insights into the local culture and fostering connections between tourists and the local community (Eshun & Madge, 2012).

However, the literature also highlights the challenges associated with public art in tourism development. Perceiving public art as inauthentic or disconnected from the local context, especially when imposed without sufficient community input, is a significant issue (Evans, 2005). In such instances, people may perceive public art as a cultural imposition instead of a genuine expression of local identity. This challenge aligns with the Experience Economy Theory, which posits that the value of tourism experiences hinges on authenticity and emotional engagement. Additionally, the maintenance and sustainability of public art projects are critical factors that influence their long-term impact on tourism (Zebracki, 2012). In summary, the literature underscores the importance of public art as a tool for tourism revitalization, particularly in culturally rich regions like Pekan Parit. However, effective public art requires thoughtful integration into the community, reflecting local values, and fostering genuine engagement. This approach not only enhances the cultural appeal of a destination but also contributes to sustainable tourism development.

STUDY AREA

Parit, a small town in Perak, presents an intriguing opportunity to investigate the potential and reception of public art in the process of urban rehabilitation, particularly in relation to tourist developments; refer to Figure 1. Mosaics and other forms of public art have the capacity to attract tourists and visitors; therefore, they provide a significant economic stimulus to the region. Through the analysis of the influence of public art on tourism in Parit, scholars may evaluate the potential of these projects to provide economic stimulation to the local community. Moreover, public art has the potential to significantly contribute to the development of a distinctive character for Parit, therefore enhancing the attractiveness of the

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town to tourists; refer to Figure 2. The goal of this study is to investigate the role of public art in shaping the town's character and enhancing its appeal as a tourist destination. Moreover, public art has the potential to greatly augment the visual allure of public areas, making Paris a more captivating and welcoming destination. The project will investigate how these aesthetic enhancements may also augment the town's accessibility and navigation, therefore increasing its appeal to tourists. Parit, a tightly knit town, provides an ideal environment for involving residents in the process of rehabilitation through public art. This study aims to investigate ways in which public art promotes community pride and involvement in tourist development initiatives. Indeed, Parit, Perak, is an excellent location for exploring the many advantages of public art in the process of urban rejuvenation. The municipality's capacity for tourism expansion, distinctive identity development, aesthetic enhancement, increased accessibility, and active community involvement make it a captivating and enlightening subject for analysis within the wider framework of public art and urban development.

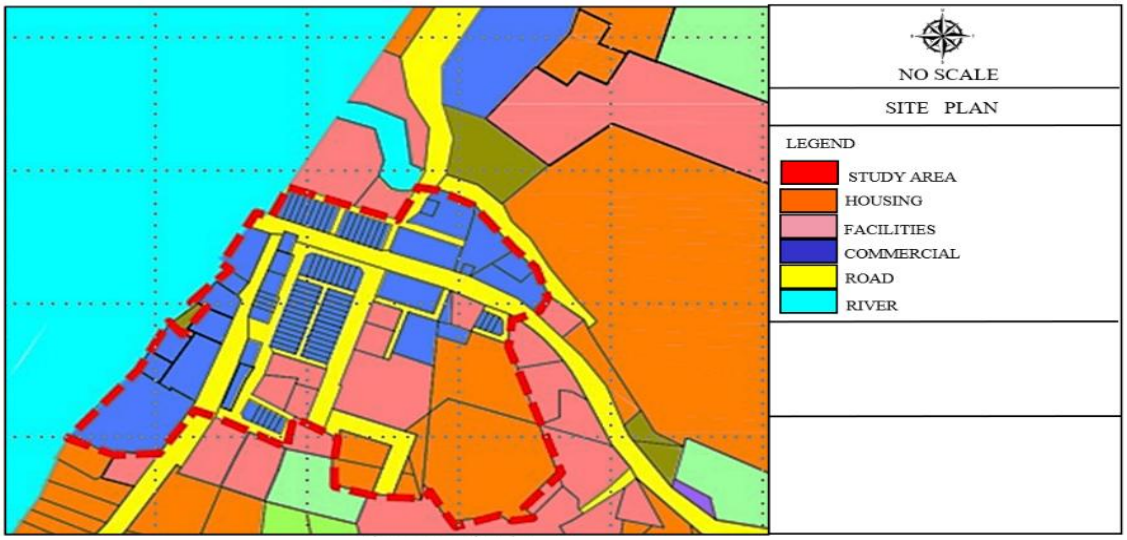


Figure 1: Site Plan



Figure 2: Public Art & Mural at Memory Lane in Pekan Parit

Source: Study Field (2024)

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METHODOLOGY

This study employs a mixed methods approach to gain a comprehensive understanding of the impact of public art on tourism in Pekan Parit, Perak. Mixed-methods research integrates both quantitative and qualitative data, providing a more thorough investigation of the research issues (Creswell, 2014). This approach combines statistical analysis with contextual insights to examine the community's reception of public art.

1. Quantitative Data Collection

A questionnaire was developed to collect primary data from residents. The questions aimed to assess their views on the influence of public art on cultural identity, economic growth, and its appeal to visitors. Convenience sampling during site visits selected a sample size of 103 respondents, targeting a diverse demographic including various age groups, occupations, and lengths of residency. While convenience sampling may limit generalizability, the sample size offers valuable insights into community perspectives.

2. Survey Instrument Validation

To ensure the reliability and validity of the questionnaire, a pilot test was conducted with a small group of participants. This helped refine the questions for clarity and effectiveness. The survey questions were also based on established scales and prior studies to maintain consistency and reliability in measuring the targeted variables.

4.1 Qualitative Data Collection

The qualitative aspect of this study involves direct observation as a method for collecting secondary data. Observations were made during site visits to assess the current state of public spaces, the positioning and reception of existing public art, and the interactions between residents and tourists. This helped identify areas needing aesthetic improvements and opportunities for increased community engagement.

4.2 Data Integration

Both primary and secondary data sources were integrated to provide a comprehensive perspective. The quantitative data from the questionnaire offered quantifiable insights, while the qualitative observations added contextual depth. Survey data alone might not fully capture the full picture of community interactions with public art and their emotional responses, but the qualitative findings complemented it.

4.3 Analytical Approach

A statistical analysis was conducted on the quantitative data to identify patterns, correlations, and trends. This helped determine the general level of acceptance of public art within the community. The integration of qualitative and quantitative findings enabled a more detailed

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evaluation of public art's role in revitalizing tourism, informing practical recommendations for policymakers and stakeholders involved in cultural and tourism development.

FINDINGS

The analysis of the survey data reveals several important aspects of community perceptions and experiences regarding public art in Pekan Parit.

5.1 The respondent came across public art in Pekan Parit.

91 (88.3%) of the total questionnaire respondents reported having encountered public art in the research area. This demonstrates that most locals are aware of and have direct contact with the public art in the area. However, just 12 (11.7%) of the respondents said they had never come across any public art in the research area, refer Table 1. The information shows that even with major attempts to introduce public art, a small percentage of citizens have not had the opportunity to see it. Given this, there is an opportunity to increase public awareness and involvement through public art, potentially enhancing the research area.

Table 1: Respondent encountered public art in Pekan Parit

Respondent encountered public art in Pekan Parit		
Do you have encountered public arts in Pekan Parit	Total respondent	Percent %
Yes	91	88.3
No	12	11.7
	103	100

5.2 Respondent's Experience on Public Arts In Revilitasing In Pekan Parit, Perak

a. Awareness of Public Art

An analysis of public awareness and acceptance of public arts in Pekan Parit, Perak, reveals a strong correlation between the presence of public art installations and the revitalization of local tourism activities. Out of the seven questions about awareness of public art, the local community in Pekan Parit prefers to respond to questions about public art, which have a mean value of 4.13 and raise awareness of the sustainability of the region's culture and heritage, refer Table 2. In addition to fostering a stronger sense of community, public art that highlights aspects of the local way of life and legacy also makes people feel prouder of their birthplace. Additionally, this promotes tourism, which benefits nearby communities on an economic and social level. Apart from that. The local community prefers not to respond to inquiries about public art in Pekan Parit that does not reflect the history, culture, or values of the city, as they perceive such art to be less relevant and meaningful. The lowest mean value of 2.5 indicates this. Furthermore, the belief that public art can enhance Pekan Parit's cultural atmosphere

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has the second-highest mean value; each value for public art in Pekan Parit adds to the city's aesthetic worth. The community's perception that public art can enhance Pekan Parit's cultural milieu and that its presence raises the city's aesthetic value accounts for the second-highest mean value in this survey. When artwork is present in public areas, it increases the attractiveness of tourism by fostering a more appealing and visitor-friendly environment.

Table 2: Awareness of Public Art

ASPECTS	LIKERT SCALE					Mean
	1	2	3	4	5	
	F	F	F	F	F	
Aware of the concept of public arts	1	3	11	84	4	3.84
	1.0	2.9	10.7	81.6	3.9	
Believe public arts can enhance the cultural ambiance of Pekan Parit	1	0	0	88	14	4.12
	1.0	0	0	85.4	13.6	
The presence of public arts in Pekan Parit adds aesthetic value to the town.	0	1	0	88	14	4.12
	0	1.0	0	85.4	13.6	
Public art in Pekan Parit contributes awareness to the sustainability of local culture and heritage.	1	0	1	84	17	4.13
	1.0	0	1.0	81.6	16.5	
Public art in Pekan Parit is neglected or poorly maintained	4	8	6	84	1	3.68
	3.9	7.8	5.8	81.6	1.0	
Public art in Pekan Parit in the city does not suitable in this current place	2	54	26	21	0	2.64
	1.9	52.4	25.2	20.4	0	
Public art in Pekan Parit does not reflect the history, culture or values of the city.	3	66	16	16	2	2.5
	2.9	64.1	15.5	15.5	1.9	

a) Perception of Public Arts

An analysis of Pekan Parit, Perak, public art perceptions reveals a positive response from both residents and visitors, which is essential to reviving the town's tourism industry. We posed eight questions about the local community's perception of public art in Table 3. Respondents with a mean value of 4.34 say that Pekan Parit can draw tourists and visitors. This is due to their understanding of the potential benefits that increased tourism can bring to the local economy and society. More tourists will boost the local economy by supporting small companies, gift shops, and dining establishments. Other advantages for the local communities include the opportunity to engage with visitors, share their customs and culture, and boost community pride. Apart from that, the average score is 4.26. Because well-integrated art enhances the city's distinctiveness and attractiveness and serves as a venue for cultural and

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social events that foster interaction between locals and visitors, the community believes that the use of public art may resume. Next, with the lowest mean (2.33) and (24.6), it indicates that many locals disagree that increasing tourist numbers will make the surrounding residents uncomfortable, and public art in this area has contributed to safety hazards for drivers and pedestrians due to the increased nuisance if Pekan Parit's public art is increased. Public art also does not have a negative impact on them, like traffic jams or any hazards to people around them. Instead, they see it to introduce the town to outsiders and help them get to know a town with a rich history.

Table 3: Perception of Public Arts

ASPECTS	LIKERT SCALE					Mean
	1	2	3	4	5	
	F	F	F	F	F	
The idea of using public art can revive Pekan Parit	1	1	0	68	32	4.26
	1.0	1.0	0	66.7	31.4	
Public arts can attract tourists and visitors to Pekan Parit	1	0	0	64	37	4.34
	1.0	0	0	62.7	36.3	
Public arts can positively impact the overall economic growth	1	0	0	65	36	4.32
	1.0	0	0	63.7	35.3	
Existing public art installations in this area are not attractive.	2	30	30	37	4	3.11
	1.9	29.1	29.1	35.9	3.9	
Public art installations in this area have caused increased traffic congestion and delay	2	60	36	3	2	2.45
	1.9	58.3	35.0	2.9	1.9	
The area has seen a huge rise in visitors due to the public art	1	14	44	40	4	3.31
	1.0	13.6	42.7	38.8	3.9	
Public art in this area has contributed to safety hazards for drivers and pedestrians due to the increased nuisance.	2	56	40	3	1	2.46
	2.0	54.9	39.2	2.9	1.0	
The arrival of more tourists will cause the surrounding residents to be uncomfortable if public art is increased in Pekan Parit	4	63	33	1	1	2.33
	3.9	61.8	32.4	1.0	1.0	

DISCUSSION

The survey findings reveal that the local community in Pekan Parit largely appreciates public art, viewing it as a valuable contributor to the town's cultural identity and tourism potential. A significant portion of respondents (88.3%) have encountered public art, demonstrating

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widespread awareness. However, a small minority (11.7%) have not, suggesting that while the current public art is visible, further efforts could enhance accessibility and visibility, fostering greater community engagement. The community's awareness of public art's role in sustaining local culture and heritage is notably high, with a mean score of 4.13. This suggests a positive sentiment towards public art as a means of cultural preservation, aligning with perceptions that public art enhances the town's aesthetic and cultural ambiance. Respondents, however, expressed lower appreciation for art installations that don't reflect Pekan Parit's history, highlighting the importance of culturally relevant artwork. In terms of public art's influence on tourism, respondents believe that it can attract visitors and support economic growth, with a mean score of 4.34. They see public art as a means of community pride and cultural expression. Importantly, the survey suggests that most residents do not feel burdened by increased tourism or safety concerns related to public art. This suggests that the expansion of public art initiatives could occur with minimal disruption, highlighting its significant role in revitalizing Pekan Parit as a cultural and tourist hub.

CONCLUSIONS

In conclusion, the study highlights the significant role of public art in enhancing both the cultural and economic vitality of Pekan Parit. The findings reveal that the majority of the local community is not only aware of but also positively engaged with the public art in their area, which they see as a reflection of their cultural heritage and a driver for tourism. Respondents acknowledge the potential of public art to draw visitors, foster a sense of pride, and stimulate the local economy, with strong support for installations that resonate with the town's historical and cultural context. The study also identifies areas for improvement, particularly the need for regular maintenance and culturally aligned public art that reflects the values of Pekan Parit. While some respondents voiced concerns about non-representative artwork, there is minimal indication that increased tourism or the presence of public art will negatively impact residents. This reinforces the idea that thoughtful expansion of public art can be a sustainable strategy for urban revitalization. As Pekan Parit continues to develop, integrating public art into its urban landscape can create a more vibrant, culturally rich environment. By promoting culturally significant, well-maintained public art, the town has the potential to grow as a meaningful tourist destination while enriching the lives of its residents.

ACKNOWLEDGMENT

I would like to express my gratitude to everyone who supported this study. Special thanks to my advisors for their guidance, to the community of Pekan Parit for their valuable insights, and to Majlis Daerah Perak Tengah (MDPT) for their cooperation. I appreciate my family and friends' support throughout this process. Thank you all for your invaluable support.

REFERENCES

Cartiere, C., & Willis, S. (2008). *The Practice of Public Art*. Routledge.

eISSN 3030-5543

Creswell, J. W. (2014). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (4th ed.). SAGE Publications.

Eshun, G., & Madge, C. (2012). *Sustainable Tourism in Africa: Approaches, Experiences, and Prospects*. University of South Africa.

Evans, G. (2005). *Cultural Planning: An Urban Renaissance?* Routledge.

Hunting, M. (2005). *Art in Public: What, Why, and How*. Random House.

Jasmi, K. A., & Mohamad, S. S. (2016). The impact of adaptive reuse on historical buildings. *Journal of Urban Heritage*, 12(3), 320-335.

Mathews, G. (2014). Public art in urban transformation. *Urban Studies Journal*, 51(6), 1153-1166.

McCarthy, J. (2006). *Regeneration of Urban Areas through Cultural Investment*. Urban Studies Press.

Miles, M. (1997). *Art, Space, and the City: Public Art and Urban Futures*. Routledge.

Richards, G. (2018). *Cultural Tourism: Global and Local Perspectives* (3rd ed.). Routledge.

Zebracki, M. (2012). The impact of public art on urban spaces and communities. *International Journal of Urban and Regional Research*, 36(3), 480-491.

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INCORPORATING TRADITIONAL NEGERI SEMBILAN ARCHITECTURE IN MODERN BUILDINGS: A CASE STUDY OF THE SEREMBAN DISTRICT ADMINISTRATION OFFICE

Othman Mohd Nor[1*], Afzanizam Muhammad[2], Haryati Mohd Isa[3,] Nurrajwani Abdul Halim[4] & Norashikin Abdul Karim [5]

[1,2,3,4]Affiliation: Department of Built Environment Studies and Technology, College of Built Environment, Universiti Teknologi MARA, Perak Branch, 32610, Seri Iskandar, Perak, MALAYSIA

*Corresponding Author: Othma622@uitm.edu.my**

Abstract: Every region in the world has distinctive architecture or monuments that serve as iconic representations of its identity. In Malaysia, Negeri Sembilan is renowned for its unique architectural style. This study aims to identify the traditional architectural characteristics of Negeri Sembilan that have been integrated into modern government administrative buildings, focusing on the Seremban District Administration Office in the capital city. The research methodology includes field observations and expert interviews. The findings reveal that key traditional elements can indeed be successfully incorporated into modern structures. The Old Seri Menanti Palace was used as a reference in this project. This study is significant because it contributes to the development of general guidelines for future projects of a similar nature. The conclusion drawn from the research is that the Seremban District Administration Office reflects traditional architectural characteristics, making it an iconic structure in Negeri Sembilan. The study demonstrates that traditional architectural features can be integrated into modern buildings, even when contemporary materials and technologies are used. This research serves as a benchmark and provides guidelines for future projects aiming to blend traditional and modern architectural elements.

***Keywords*:** Cultural Identity**,** Seremban District Administration Office, The Old Seri Menanti Palace, Traditional Architectural Characteristics, Cultural Identity

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INTRODUCTION

To recognize the identity of a state, one must examine and understand the architectural style of its buildings which are usually known as local landmarks. Lynch (1960) stated that the image of a city can be seen through the identity of buildings that serve as its landmarks. This is evident in all countries around the world. Such landmark buildings have various features that symbolize the identity and pride of their respective nations. Examples of these landmark buildings include the Eiffel Tower in France, the Opera House in Australia, the Petronas Twin Towers, Kuala Lumpur City Centre (KLCC) in Kuala Lumpur, and many more. Similarly, in Malaysia, every state and district has its own landmark buildings. The district office building, as the administrative center of the district, serves as an icon of local identity.

1.1 Background of the district office

The district office serves as an administrative center or the nerve of governance for the subdivision of a small area into mukim and villages. The district office houses offices for the district officer, mukim penghulu, religious offices, land and mines offices, and several other government offices that directly interact with the community. Additionally, it provides community services concerning welfare, social issues, and local bill inquiries. Due to its diverse functions, the required space capacity is certainly substantial.

1.2 Importance of Local Governance

As the nerve center of administration in a district, the concept of the district office serves as a place of governance and also a provider of various services to the community. The term "office" implies a working space or administrative area, while "district" refers to the jurisdiction of a governing body, which is a part of a state which includes smaller subdivisions such as mukim (sub-districts), regions, or areas.

As the administrative nerve center, the district office also serves as a gathering place for the leaders of each mukim. Administrative affairs centralized in the district office primarily provide service concepts. Government offices within the district office offer services related to taxation, customary matters, and land rights, as well as the management of inheritance and heritage matters by the land and mines office. Social welfare issues are addressed by the Social Welfare Department, while a discussion area is provided for matters related to customary land law in case there is no resolution reached. For religious matters, the Islamic Religious Office strives to resolve issues related to consultations, marriages, and divorces.

1.3 Objectives of the Study

The purpose of this study is to examine the adaptation process that occurred at a district office in Seremban, which adopted the local architectural identity as a model for its building. This

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process began with the tender document provided by the Public Works Department (JKR), which specified that the building's design concept must be based on local identity, in line with an administrative building in Negeri Sembilan, namely the Old Seri Menanti Palace as a reference. This palace is a local landmark that should be highlighted, as it was once the administrative center of the district in Negeri Sembilan.

Furthermore, the objective of this study is to observe the similarities in design chosen by the architect, such as the building's plan, façade, interior spaces, contour placement, and surrounding area. Does the function of the district administrative center align with the same location, size of the compound, or courtyard? Additionally, the study will assess whether the design of each space incorporates traditional features of the Old Seri Menanti Palace.

1.4 Background of the Seremban District Office

The Seremban District Office serves as an administrative center and a resource for the community. Originally, it was located in the center of Seremban town in an old colonial building. However, a new building was later constructed in the Seremban Dua area, and the office moved there, now owning its own building. The new building was designed by Architect Ahmad Nazri bin Mansur from Wangsa Maju, Kuala Lumpur. He explained that the design had to meet the needs of their client, the Public Works Department, which provided guidelines for the project. The design was inspired by the Old Seri Menanti Palace.

Architect Nazri studied the Old Seri Menanti Palace and other traditional buildings, like the Ampang Tinggi Palace and traditional houses, to ensure the new design reflected the local architectural style. He worked with the guidelines provided and added modern elements to the building. The Seremban District Office is led by the District Officer, who manages several departments. It also acts as a community service center for tax payments, local bill inquiries, and administrative services for village heads A. Zainuddin (2018), R. Ismail (2022). The district administration operates from this office.

1.5 Traditional Architecture of Negeri Sembilan

The design of the palace building, its scale, and typology are not much different from traditional houses. The quality of craftsmanship and artistry is of a high standard. The meticulous construction and ornamental finesse can be observed in the Ampang Tinggi Palace in Negeri Sembilan. This palace was built in 1861 during the reign of Yam.

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Figure 1: Ampang Tinggi Palace, which has been relocated to a new location at the Seremban Museum (Source: Seremban Museum, 2010).

This palace is made from cengal wood and does not use any nails. It is a post-and-beam structure with a high floor, a long roof, and a unique design that allows it to be assembled and disassembled at different sites without damaging any parts. According to Zainal Abidin, N., Raja Shahminan, R. N., & Ibrahim, F. K. (2017), the carvings on the frames and walls of the palace hold specific meanings within the Minangkabau community, such as “seia-sekata,” “sitampuk manggis,” and “itik pulang petang.” The connections between the carved panels and the frame use a traditional joinery system, strengthened with wooden dowels.

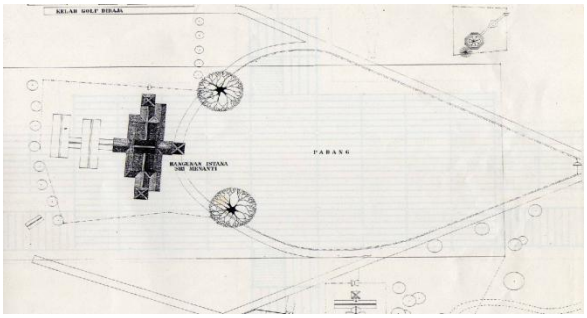
The foundation of the palace pillars is constructed from river stones that are partially buried in the ground. Additionally, there is a kitchen house surrounded by an open platform with no walls. The main house features a ceremonial room that is separated from the main living area and is nearly as tall as the roof. The floors and walls of the palace are made from cengal wood. Sliding doors are used for defensive purposes against enemy attacks. In addition to their decorative function, the doors and openings in this palace allow for free circulation of air and wind. The curved roof of the palace symbolizes the prosperity and integrity of the Negeri Sembilan community.

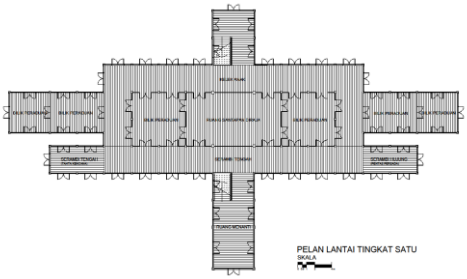
The Old Seri Menanti Palace in Kuala Pilah, Negeri Sembilan, is a palace built during the colonial era. It served as the official residence of the Yang di-Pertuan Besar of Negeri Sembilan around the year 1900. The Old Seri Menanti Palace is a unique structure made of wood. It was constructed in 1902 and completed in 1908. His Royal Highness, the Yang di-Pertuan Besar Tuanku Muhammad Ibni Almarhum Yamtuan Antah, resided in this palace until 1931, before moving to a new palace built near the old palace.

The site plan of the palace shows that the Old Seri Menanti Palace faces an open area, facilitating gatherings for the community to meet with the king. The ruling king uses the front area of the palace to make announcements and engage in activities with the community. This prominent location symbolizes its historical significance as both a center of administration and royal residence. It represents status and the symbolism of justice. According to Syed Iskandar

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(2015), the front of the building faces southeast, aligned towards the east, while the elongated orientation of the building is also directed towards the qibla (the direction of prayer in Islam). The relationship between the living space and the physical environment is represented in the form of a horizontal axis. Facing the river and open spaces is indeed a customary practice in the placement of traditional houses.





Site Plan 1st Floor Plan

Figure 2: Old Seri Menanti Palace, site plan, Layout of Old Seri Menanti Palace Floor Plan (Source: KALAM UTM, 2006).

This palace is four stories high. The original plan was designed by two Malay craftsmen named Tukang Kahar and Tukang Taib. Tukang Kahar was awarded the title of Dato' Panglima Sutan by Tuanku Muhammad for his contributions and services. The palace plan was further detailed by the Chief Draftsman, Mr. Woodford, from the Public Works Department in Seremban, and was approved in November 1902 by the State Engineer and the British Resident.

This palace has 102 pillars, including four main pillars that are 67 feet long. All four pillars are made from Penak wood, which was sourced from Bukit Pergai, Jelebu. Other woods were sourced from Bukit Tinggi. The uniqueness of this palace is that it does not use any iron nails; instead, its nails are made of wood. Hard wooden pegs are used to join the boards together.

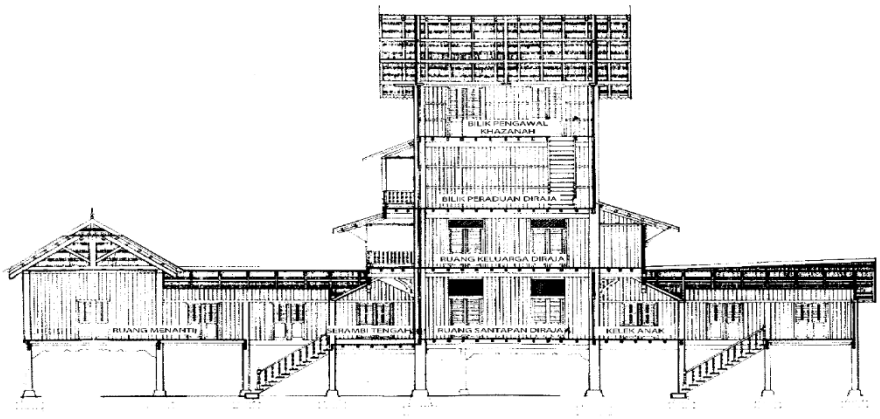


Figure 3: Cross-section of the Seri Menanti Palace (Source: KALAM UTM, 2006)

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The body of the palace consists of floor beams to roof beams, with the floor made of Penak wood and the floorboards being fastened with wooden nails made from nibung wood. The outer walls can be adjusted to allow light and airflow to move freely.

Table 1: List of Space in Old Seri Menanti Palace

Position of Palace Spaces	Area
a) First Floor	
1. Anjung - An area (waiting space) for guests.	Public Area
2. Serambi - Front, middle, and end sections (spaces for meetings and administrative discussions).	Public Area Public Area/ Semi Public
3. Main Room - Dining area, bedrooms for princesses, princes, and royal guests.	
b) Second Floor - Bedroom of the **Yang di-Pertuan** (left) and bedroom of the **Tuanku Ampuan** (right).	Private Area
c) Third Floor - Royal bedroom (shared)	Private Area
d) Fourth Floor - Royal treasury/resting area.	Private Area

The Old Seri Menanti Palace serves as a residence, and the serambi area functions as a public space for receiving the community and state dignitaries. The layout of the palace's serambi is similar to the design of the traditional long-roof serambi of Negeri Sembilan.

INTEGRATION OF TRADITIONAL ELEMENTS IN MODERN DESIGN

It was found that several elements from the Old Seri Menanti Palace have been applied in the design of the Seremban District Office building. These elements include several aspects as follows:

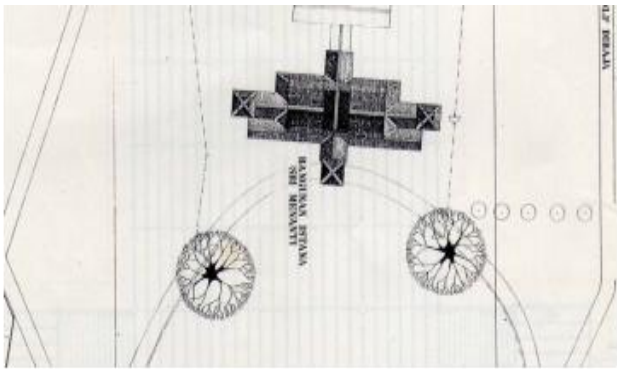
The left side view of the Seremban District Office (PDS) building, in terms of the building block, shows shapes like the Old Seri Menanti Palace (ILSM), especially regarding the wall shapes, roof design featuring elements like tebar layar, gajah menyusu, and overlapping roofs. The presence of pillar structures in the building reinforces the fact that elements of traditional architecture are incorporated into the Seremban District Office, reflecting the positioning of the pillar structure. The only difference is that while the traditional structure used hardwood materials, the current building employs concrete. On the right side of the building, the pillar structure also maintains the traditional roof shapes, and the use of a long corridor space similar to that of ILSM is presented on the left block of the building, which features a balcony with a hand railing.

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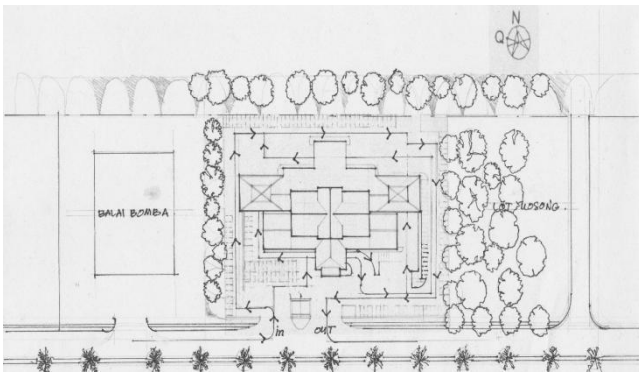
2.1 Typology of Site Plan

The typology of the Old Seri Menanti Palace (ILSM) site clearly demonstrates its grandeur as a royal institution situated in an open area, with its elevated position making it more prominent compared to the surrounding houses. In the past, the river path was the most important route for movement, allowing access to the upper and lower parts of the river. In contrast, the Seremban District Office (PDS) now features a building facing the main road, which serves as a crucial route. The current site was chosen by the authorities not for its proximity to the river but because it has been gazetted as part of the urban planning framework.

The current site plan maintains the elements of an administrative center and stands two stories tall. The design bears resemblance to ILSM, with the open space in front of the building primarily designated for parking. The current location is adjacent to the fire station, courthouse, and police headquarters, while ILSM stands alone, dominant in its role as the heart of the royal governance system. The similarities in form and location highlight the accurate application of these elements in the current site plan.



Site Plan Of Old Seri Menanti Palace (ILSM)



Site Plan Seremban District Office (PDS)

Figure 4 : Site Plan of Old Seri Menanti Palace and Seremban District Office

In terms of the site analysis conducted on the district office building, its location is identified as an administrative area due to the presence of several other administrative institutions such as the courthouse, fire headquarters, police headquarters. The similarities drawn from the common location include :

- Facing the main road, with an open area in front of the building
- Being the largest building in the area, acting as an icon of district governance
- The multi-tiered roof design and symmetrical positioning

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2.2 Layout Plan

The comparison between the layout plans of the Old Seri Menanti Palace (ILSM) and the Seremban District Office (PDS) can be made based on two elements: symmetry and the design of the floor plan and the function of the building's spaces. This is elaborated further below:

a) Symmetry and Floor Plan Design

The balance of the layout and the position of the floor plan of ILSM is symmetrical. In its long antechamber, the main staircase is in the center, along with the rear staircase. This symmetrical position is aligned with the central placement of the main pillars, which has four main pillars extending towards the back, leading to the pathway to the kitchen and other areas. The balanced design of the layout makes it attractive and suitable for its function as a center of administration and royal residence. In comparison, the floor plan of the Seremban District Office (PDS) is also symmetrical, with a similar shape of the antechamber. However, the PDS building is shorter than ILSM as it houses the main offices for the District Officer and District Engineer. The symmetrical arrangement of the antechamber is aligned with the main staircase and connects to the rear area that contains offices related to administration.

In the palace's floor design, the front area is divided into two parts, which include the antechamber, the beginning, middle, and end of the serambi (veranda). In the center of the building, there is a dining area, with chambers for the royal children and guests on either side. The similarity in the shape of the floor plan is observed in the front division. There are high and low floor constructions in the area facing the antechamber. In contrast, in PDS, this division appears in the elongated floor layout, similar to the serambi, with a portion of the antechamber, functions as the main administrative office for the District Officer (DO).

There is no hierarchical structure in the floors; however, there is a division of administrative spaces which serves as a waiting area for guests on certain matters, similar to ILSM. There are wing buildings on both sides of the structure that reinforce the use of traditional elements in this modern building. The antechamber extends to the back, connecting the various rooms within the district office.

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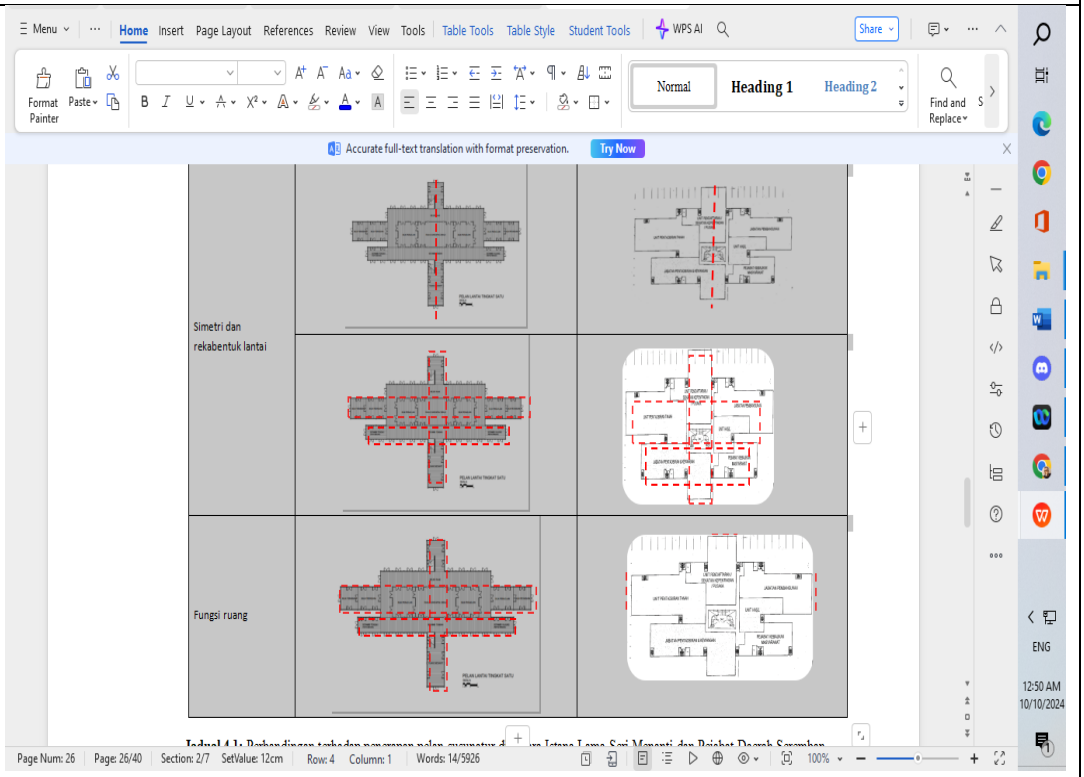
	Plan of Old Seri Menanti Palace	Seremban District Office (PDS)
Symmetry and Floor Plan Design Function of space		

Figure 5 : The comparison of layout plan applications between Istana Lama Seri Menanti (ILSM) and the Seremban District Office (PDS)

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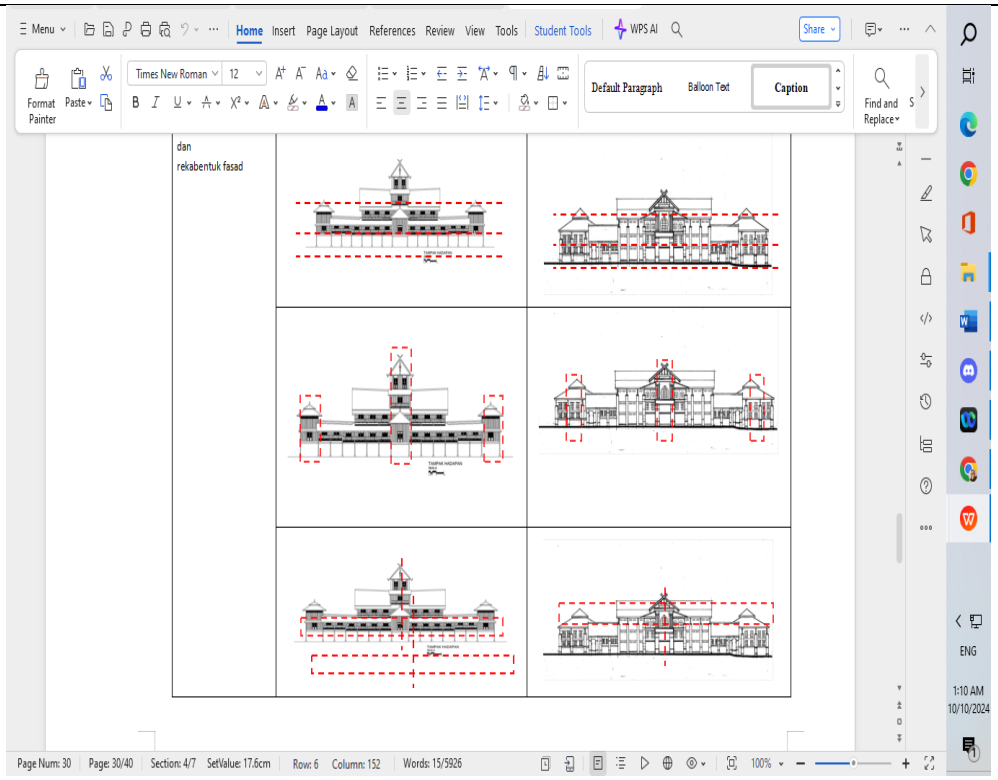
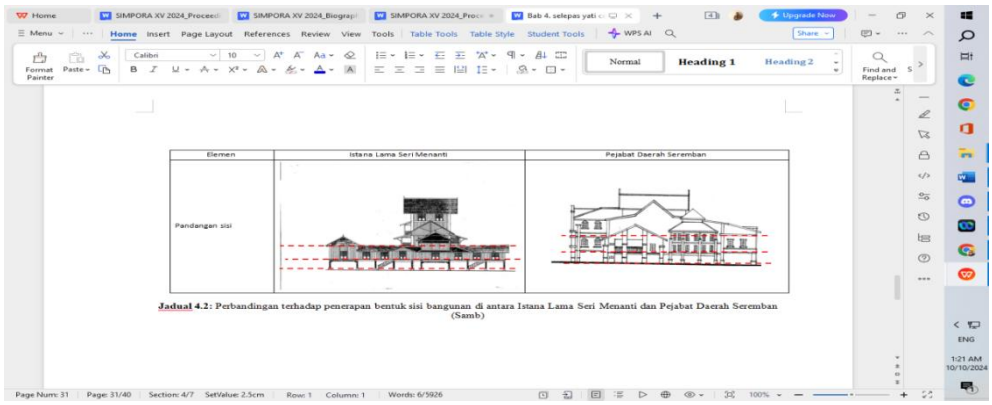
Element	Old Seri Menanti Palace	Seremban District Office (PDS)
Front View and Facade Design		
Side elevation		

Figure 6: Comparison of the Application of Side Building Forms Between the Old Seri Menanti Palace and the Seremban District Office

2.3 Side View

The side view of the building exhibits several similarities in form, particularly in the roof elements of the district office. The roof height varies, showcasing a similarity in the "tebar layar" (sailing roof) design on the main building, along with overlapping roof structures. The farthest edge of the administrative office features an overlapping roof, which houses government departments like those in the ILSM (Istana Lama Seri Menanti).

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The concept of the "padi house" in Minangkabau architecture also incorporates overlapping roofs but has a distinctive undulating effect. This architectural element is reflected in the building blocks as well. Additionally, another similarity lies in the roof design, which utilizes both "tebar layar" and overlapping roofs, akin to the "gajah menyusu" (elephant nursing) style. Both the ILSM and PDS adopt a more simplified concept by incorporating overlapping roof forms.

2.4 Roof Design

The comparison of the roof designs between Istana Lama Seri Menanti and the Pejabat Daerah Seremban is as follows: The roof structure employs a combination of long roofs, hip roofs, and overlapping roofs. This roofing style has a suitable slope for the equatorial climate, which experiences high annual rainfall. The main building's roof design includes a "tebar layar" (sailing roof) and a multi-tiered design, particularly at the anjung (veranda), where a cross-shaped skylight is present. The overlapping roofs on the left and right sides of the administrative building create a unique visual impact, preventing the front view from appearing rigid. This variety adds an appealing aesthetic effect within its context.

2.5 Function of Space

The appearance of style and design that embodies local architectural identity must adhere to concepts rooted in local characteristics, such as landscape conditions and climate changes, while respecting cultural heritage that reflects the socio-economic patterns of the community, as well as advancements in technology over time.

The function of the space in ILSM (Istana Lama Seri Menanti) on the ground floor includes the main staircase leading up to the palace. Ascending to the upper level, visitors encounter the *anjung* area, which serves as a waiting space for royal guests or the public wishing to meet the Yang di-Pertuan. The front *anjung* is a semi-public space. Upon entering the area beyond the anjung, visitors can sit in the main *serambi* to meet the Yang di-Pertuan. The *serambi* at the end is designated for the Raja Muda to receive guests and the public members.

The layout of the Pejabat Daerah (District Office) shares similarities with the floor plan of Istana Lama Seri Menanti, particularly between the front and rear spaces of the building. The layout includes an anjung, a central serambi, and both front and rear serambi. The main entrance staircase is centrally located, with sections on the left and right, providing connectivity between spaces. The central staircase leads into the building, symbolizing respect and welcoming approach for staff and guests into the premises.

RESEARCH METHODOLOGY

The research methodology is crucial in ensuring that the study is conducted in an organized manner, ultimately leading to quality research outcomes. According to Fellows and Liu (2003), a study aims to answer questions or to expand existing knowledge. Therefore, this research examines the attributes of regionalist architecture as applied to modern buildings. This stems

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from a briefing project by the Public Works Department (JKR) to architectural consultants to use the architecture of Istana Lama Seri Menanti as a reference in designing the Pejabat Daerah Seremban. Besides, a pilot survey of several District Office buildings in Negeri Sembilan was conducted to observe the influence of regionalist architecture on these buildings.

This study is exploratory and descriptive in nature. Exploratory research provides a deeper understanding of a particular issue. Through exploratory research, researchers can clarify concepts and establish priorities for future studies (Syed Arabi Idid, 1998). By exploring the influence of regionalism on the architectural design of modern buildings, the researcher can identify the attributes involved in the application of regionalist architecture, particularly in the District Offices of Negeri Sembilan. Attributes in this context refer to related elements such as the meanings associated with regionalist architecture, including place, local architectural style, and culture.

In this study, a qualitative approach was employed, as careful observation is essential to obtain more realistic research results. Qualitative research emphasizes case studies, involving a specific District Office building in Seremban to examine the application of traditional architectural elements using Istana Lama Seri Menanti as a reference. Interviews were conducted to identify the architectural elements applied to the District Office building. The findings of this study is meant to produce a general guideline for applying regionalist architecture in modern buildings.

The information obtained provides useful knowledge and experience regarding issues, further offering potential for deeper studies. After gathering this information, descriptive research was conducted. According to Gay, R.L. (1996), descriptive research involves collecting data to answer questions within the field.

CONCLUSIONS

The study of regionalism in architecture, particularly its application in modern buildings such as the Pejabat Daerah Seremban and its influence from the Istana Lama Seri Menanti, highlights the significance of integrating traditional elements into contemporary designs.This research has illustrated how regional architecture can serve as a cultural anchor, reflecting the socio-economic realities and climate of the local context. Key findings indicate that:

Cultural Relevance: The integration of local architectural styles fosters a sense of identity and belonging within the community, reinforcing cultural heritage amidst modern development

Functional Design: The study has shown that elements derived from traditional architecture, such as roof designs and spatial arrangements, not only enhance aesthetic appeal but also improve functionality in terms of space utilization and environmental adaptability

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Government Guidelines: The directive from the Jabatan Kerja Raya (JKR) to use Istana Lama Seri Menanti as a reference in designing the Pejabat Daerah Seremban signifies a formal recognition of the value of regional architecture in contemporary public buildings.

Influence of Regionalism: The comparative analysis of various district office buildings in Negeri Sembilan reveals an increasing trend toward regionalism, suggesting a growing recognition of the need for designs that reflect local characteristics and environmental conditions.

RECOMMENDATIONS

Based on the findings of this research, the following recommendations are proposed to improve the integration of regionalism in modern architecture:

Incorporate Local Input: Engage local communities and stakeholders in the design process to ensure that new buildings reflect their needs, preferences, and cultural values. This participatory approach can help strengthen community ties and promote acceptance of new developments.

Policy Development: Promote policies that encourage the use of local materials and architectural styles in public buildings. Government guidelines should prioritize regional architecture to preserve cultural heritage while addressing contemporary needs.

Education and Training: Develop educational programs for architects and builders that emphasize the importance of regionalism and traditional design principles. Workshops, seminars, and design competitions can raise awareness and inspire innovative applications of local architectural styles.

Research and Documentation: Conduct further studies to document regional architectural styles and their evolution over time. A comprehensive database could serve as a resource for architects and planners to facilitate informed decisions that honor local traditions.

ACKNOWLEDGMENT

By following these recommendations, future architectural projects can enhance cultural significance, foster community engagement, and contribute to the sustainability of local environments, ultimately leading to a richer and more cohesive architectural landscape.

Special thanks to the Jabatan Kerja Raya (JKR) for providing access to essential resources and information, as well as for offering the opportunity to explore the application of regional architecture in public buildings. The support from various architects and consultants involved in the Pejabat Daerah Seremban project was invaluable in understanding the intricate relationship between modern design and traditional elements.

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I would also like to acknowledge the assistance of the administrative staff and officials at the district offices across Negeri Sembilan for allowing site visits and sharing their knowledge regarding the design and construction processes of their buildings. Their input significantly enriched the scope of this research.

REFERENCES

Fellows, R and Liu, A. (2003). Research Methods for Construction. Oxford : Blackwell Publishing.

Gay, R.L. (1996). Educational Research: Competence for Analysis and Application, New Jersey: prentice-Hall, Inc.

Noor, F. A., & Khoo, E. (2003) Spirit of Wood: The Art of Malay Woodcarving

Ismail, K. (2022).The impact of local governance on community development: A Study of District Offices. Journal of Community Development, 14(2), 102-116.

Lynch, K. (1960). The Image of the City, Jack L. Nasar Sage Publications

Syed Arabi Idid. (1998). Kaedah Penyelidikan Komunikasi dan Sains Sosial, Kuala Lumpur: Dewan Bahasa dan Pustaka.

Syed Iskandar, S. (2015*),* Dambaan budaya Dalam Seni Bina, Sembilan Seri Istana Sri Menanti : Simposium Antarabangsa 2014 Sejarah, Budaya, Teknologi Dan Seni Bina: Politeknik Port Dickson, Negeri Sembilan.

Zainal Abidin, N., Raja Shahminan, R. N, & Ibrahim, F. K. (2017) Architectural Influences of Istana Lama Seri Menanti, Negeri Sembilan published in Planning Malaysia, 15(1), 230-245

Zainuddin, P. (2018). The role of district offices in local governance. Journal of Local Government Studies, 15(3), 45-58.

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A CLIMATE-BASED APPROACH TO THERMAL COMFORT ADAPTATION IN COLONIAL ARCHITECTURE: A CASE STUDY OF BIREUEN REGENT HALL, ACEH.

Zuraihan[1,]*, Fitri Muliani[1,] Marisa Hajrina[1], Cut Azizah[1], Nova Purnama Lisa[2], Idayani[1]

[1]Universitas Almuslim, Bireuen, Aceh, [2] Universitas Samudra, Langsa, Aceh

**zuraihan.almuslim@gmail.com,*

Abstract :The purpose of this study is to determine how the tropical environment affects colonial building design's energy efficiency, comfort, and building shape. Descriptive and qualitative research methodology focusing on case studies was employed. Data were gathered through direct observation of the research subject, Pendopo Bireuen. Humid tropical architecture is characterized by wide roof forms that block sunshine and rainwater, adapting buildings to the local climate. The Indies Empire Style (18th–19th century), the Transitional Architectural Style (1890–1915), and the Modern Colonial Architectural Style (1915–1940) are the three periods of the evolution of Indonesia's colonial building typology. Colonial architecture in Indonesia has progressively adapted to the country's tropical environment which results in some modifications to building designses. It was found that several supporting elements of colonial buildings in Pendopo Bireuen in tropical climate areas have distinctive physical elements as adaptations to high temperatures and heavy rainfall. The climate-supporting elements are roof shapes, high openings, canopies/overhangs that protect from exposure to sunlight, and ventilation on the building walls as natural circulation in the room so that the room feels cooler.

Keywords**:** *Colonial Architecture, Tropical Climate Influence, Comfort, Qualitative Descriptive.*

INTRODUCTION

Colonial buildings represent a mixture of European architectural style with local adaptation processes including the climate in Indonesia (Bu'ulolo et al., 2020). Humid tropical architecture is dominated by wide roof shapes that serve as barriers against rainwater and

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sunlight which facilitate building adaptation to the local climate (Hardiman & Sukawi, 2013). This study aims to identify the influence of the tropical climate on building forms, particularly, colonial buildings. This study is significant for improving comfort and energy savings in buildings influenced by the tropical climate on colonial building designs. The typology of colonial buildings in Indonesia is divided into periods, namely the Indies Empire Style (18th-19th century), the Transitional Architectural Style, and the Modern Colonial Architectural Style (Tamimi et al., 2020).

1. Empire Style of the Indies (18th-19th Century)
   During his tenure as Governor-General of the Dutch East Indies, Herman Willen Daendels(1808-1811) (developed this architectural style, (Hardinoto, 2008). The Indische Empire Style, which was also known as the Imperial style, emerged during the mid-18th century and developed until the late 19th century. Beginning in the suburbs of Batavia (Jakarta), this architectural style was a result of Dutch culture blending with Indonesian and some Chinese elements. The architecture of the Indische Empire is characterized by:
   a. The main bedroom and additional bedrooms are arranged in a central space with a completely symmetrical floor design. The front and rear terraces (voor galerij and achter galerij) are directly connected to this central space.
   b. The layout is fully symmetrical, with a central room in the middle consisting of the master bedroom and other bedrooms. This central room is directly connected to the front terrace and the back terrace. (voor galerij dan acher gakerij).
   c. The terrace is usually very spacious , there is a row of Greek style columns at its ends including Doric, Ionic, and Corinthian designs.
   d. The kitchen, bathroom/WC, storage, and other service areas are separate from the main building.
   e. Next to the main building, there is a pavilion used as a guest bedroom.

   A pavilion that serves as a guest bedroom is located next to the main building. The traits of architecture in the Indische Empire Style (18th–19th Century) are described by Purnomo et al. (2017). Handinoto (2006) states that this style of architecture is characterized by a shield roof construction with a tiled roof covering, bricks for the walls and columns, the use of wood, especially for the rafters, frames, and doors, and the use of glass materials, which were not yet common during that period.

2. The Style of Transitional Architecture (1890-1915)
   Handinoto (2012) claims that Indonesia's transitional architecture was only in place from 1890 to 1915, corresponding to the late 19th and early 20th centuries. The Dutch East's shift was from the 19th to the 20th century. It was influenced by numerous social transformations as a result of colonial administration political policies, technological advancements, and industrialization. Handinoto (2012) lists several attributes of transitional architecture, including:

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a. The design still adheres to the 'Indische Empire' style, such as complete symmetry and surrounding terrace, and Greek-type columns were eventually removed.
b. Influences from Calvinist churches in the Netherlands, such as gables along the riverfront return, an attempt is made to develop a romantic impression on facades, and tower is constructed at the main entrance.
c. The gable and hip roof shapes with tile coverings are still widely used, and there was an effort to incorporate roof ventilation (dormer).

CHARACTERISTICS OF TRANSITIONAL ARCHITECTURE (1890-1915) (PURNOMO ET AL., 2017)

According to Handinoto (2006), the characteristics of transitional architecture include gable and hip roof constructions, tile roof coverings, the use of ventilation on the roof (dormer), high roof shapes with a large slope between 45-60 degrees, the use of curved shapes, Greek order columns are starting to be abandoned, columns are now made of wood and concrete, load-bearing walls, the main building materials are brick and wood, and the use of glass (especially on windows) is still very limited.

3. The Style of Modern Colonial Architecture (1915–1940) (Tamimi et al., , 2020) After 1900, Dutch architects began to reject the Empire Style with modern architecture, according to Handinoto (1993). When academically trained Dutch architects arrived the Dutch East Indies, they found themselves facing a very unfamiliar architectural style because the Empire Style, which originated in France, was not well accepted in the Netherlands. The following traits define modern colonial architecture:
   a. There is greater variety in floor plans, which reflects the creativity of contemporary architecture.
   b. Avoidance of surrounding terraces and symmetrical design with common use of light-blocking components.
   c. The appearance of buildings reflects Form Follow Function or Clean Design.
   d. Roof shapes are still dominated by gable or hipped roofs, with covering materials like tiles or shingles.
   e. The use of concrete construction, using flat concrete roofs which were not seen in previous eras.

The characteristics of Modern Colonial Architecture (1915-1940) as described by Purnomo et al. (2017), and Handinoto (2006), include the use of flat roofs made of concrete, horizontal facades, and the beginning of cast iron , the increasing use of glass in large quantities, the dominant use of white color, walls serving merely as coverings.

Gradually, colonial architecture was adapted to Indonesia's tropical temperature. These changes resulted in buildings that retained Dutch architectural features but still incorporating features to withstand high heat and heavy rainfall. The roof's design, large openings, sun-blocking canopies and overhangs, and ventilation on the building walls all contribute to the environment by allowing natural circulation and a cooler interior temperature. Despite the

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adaptations, not all Dutch colonial buildings in Indonesia has sun shading to protect the facades from the harsh country's temperature.(Hidayat Nur, 2021).

In tropical climate regions, natural conditions may influence building design significantly. Therefore, the consideration of these conditions cannot be separated from architectural building design. The main characteristics of a tropical climate include:

1. High temperatures with an annual average not below 20℃; another prominent feature is
2. High humidity (80%)
3. High rainfall
4. Global horizontal solar radiation
5. The sky is generally always cloudy, with sky illumination reaching 15,000 candela/m2.
6. Relatively low wind speed throughout the year (not below 20)

Tropical architecture is generally characterized by wide roof shapes that withstand heavy rainfall and block the scorching sun. The tropical climate plays a significant role in shaping buildings, particularly colonial buildings. Climate conditions such as air temperature, solar radiation, wind, humidity, and rainfall have a great impact on the design of colonial buildings. (Bu'ulolo et al., 2020).

1.1 Goals and Objectives

The purpose of this study is to determine how the tropical weather affects architectural design, with a specific focus on colonial architecture. This research is significant to address issues concerning comfort and energy efficiency in buildings affected by tropical climate of colonial architectural styles.

METHODS

A descriptive qualitative methodology in a case study is employed as part of its analytical approach in this research. Direct observation of research objects concerning building orientation, roof design, eaves, and internal architectural features including walls, floors, openings for ventilation, and spatial layout was used to gather the data about how buildings are adapted to tropical climates.

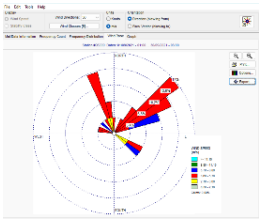
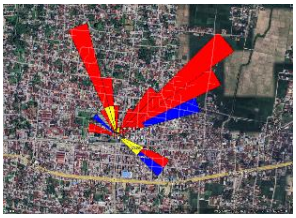
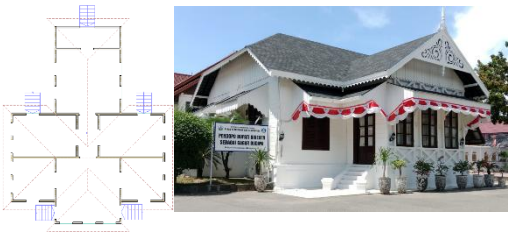
CASE STUDY: BIREUEN REGENT HALL

Constructed in 1934, the Bireuen Pendopo is a structure of colonial heritage that served as a pendopo, or house, meeting hall, and office (Fithri et al., 2022). Colonial architecture is an architectural style that blends European and Indonesian cultural influences. Europeans created the colonial style, which is known as Dutch Colonial to replicate buildings from their native regions while adapting to the environment and customs of Indonesian society. This adaptation involved external and internal architectural forms of colonial buildings. The elements include adjustments to building orientation, roof design, eaves, spatial arrangement, apertures and ventilation, walls, and floors to suit the environment of tropical climate.

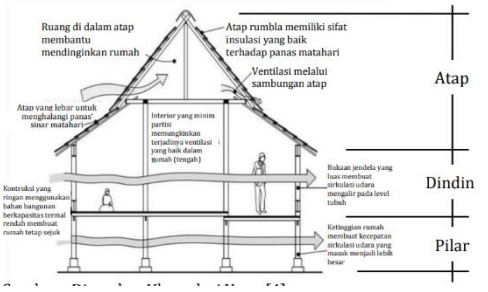
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ANALYSIS & DISCUSSION

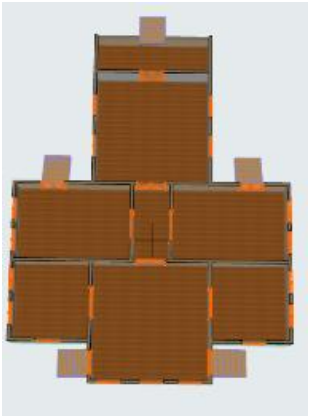
External and internal appearance of the building:

No.	Elements of the Outside & Inside of a Building	Data	Information
Elements of the External Form Buildings			
1	Building Orientation	Gambar 1. Analisa Angin dengan WRPlot  	The building experiences a very high wind potential of 3.6 to 5.70 m/s due to its north-south orientation. In order to promote comfort within the building and help it adapt to the local environment, wind from the north is directed into the building through ventilation and openings around the building for appropriate air refreshment and to facilitate air exchange within the space (Zuraihan, Munandar, Muliani, & Aris, 2023).
2	Roof Design		Climate Adaptation -Colonial buildings are designed le to function effectively and adapt well to the local climate. (Nur Hidayat, 2021) The roof structures of the building consists of three types; a combination of shield or pyramid roof constructions, flat roofs on terraces, and sloping roof that surrounds the porch. (Firzal, 2011). The roof adaptation at Pendopo Bireuen is a combination of a gable roof and a shield roof design.

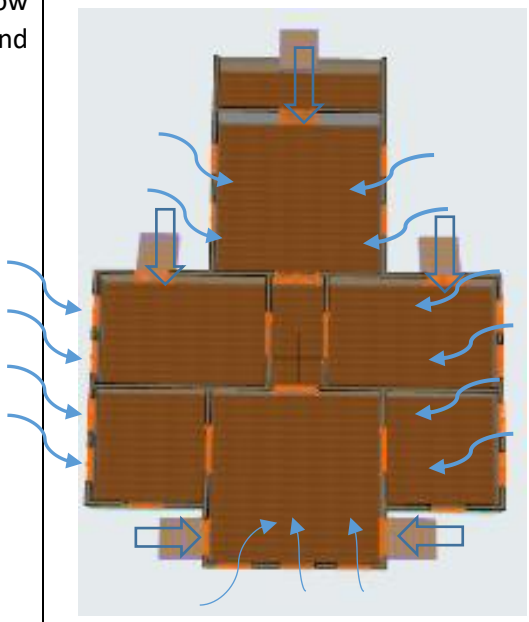
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No.	Elements of the Outside & Inside of a Building	Data	Information
3	Tympanon (Wind Sign)		Functions as a wind direction indicator: a. The tree of life, horse head, sun wheel and Christian symbol. b. The symbol is a cross, a heart, an anchor, a Roman Catholic symbol c. Miskelk and hostie
4	Eaves		The drip at the front of the building functions as a retainer to prevent rainwater from flowing into the house and the drip is an area located at the top of the window in the form of a protruding surface from the building wall or at the edge of the roof. The function of eaves varies, including as a shade, a protecting element against weather conditions, especially rainfall and hot sun. (Supriyadi, 2007).
5	Underground/stage	 	The pit/stage design is an adaptation of traditional architecture which reflects people's adaptation to the natural environment. It helps to manage water tides, avoid flooding and promote the flow of air around the building. Several factors that influence air flow patterns and wind speed, such as configuration, orientation, height, eaves, shape of the area below the house. The space beneath the house plays a role in air distribution and ensures

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No.	Elements of the Outside & Inside of a Building	Data	Information
			thermal comfort. Wind speed under the house will increase if the underside of the house is lower and the wind distribution pattern around a house that has openings is more effective compared to a house without. (Latif et al., 2016).
6	Back Porch		The veranda is an open part of the house both on the front and back, such as a terrace or porch that connects directly to the atmosphere outside the house.
Tangible Elements in Buildings			
1	Internal Spatial Planning		The spatial layout in a building consists of one or more rooms which can be arranged in groups, side by side or in a row lengthwise or in a linear (Samsudi et al., 2020). The longitudinal spatial arrangement allows the entire space to have direct contact with the environment. Besides, the establishment of openings in the walls of the building's exterior functions for air circulation and natural lighting.

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No.	Elements of the Outside & Inside of a Building	Data	Information
2	Door and Window Openings and ventilation	 	Opening windows, doors, and ventilation holes affects the flow of natural light and air into and out of a building. A window with numerous holes is used to allow wind to enter the structure. Because the doors and windows are oriented to face one another, cross ventilation—a natural    and effortless way for air to enter and exit a room—is made possible. opening type (Siti Belinda Amri, 2020). Ventilation and Door Types  Window Types
2	Wall		The building walls use wooden walls as thermal adaptation strategy by using materials with low conductivity, (Vazri Muharom & Rifky, 2022)

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No.	Elements of the Outside & Inside of a Building	Data	Information
5	Floor		The floor concept uses wood as a material and has a bottom that functions as an air flow from the building floor to increase thermal comfort in the building.

CONCLUSION

Colonial architecture is defined as an architectural style that combines European cultural elements with those of the archipelago. Tropical climate adaptation in colonial buildings is a modification of building designs to suit the local climate, creating designs similar to those in their regions of origin. The adaptation of the exterior and interior forms of colonial buildings to the tropical climate includes building orientation, roof design, eaves, spatial layout, openings and ventilation, walls, and floors.

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REFERENCES

Bu'ulolo, F. F., Silitonga, S., & Yulianti. (2020). Identifikasi Adaptasi Arsitektur Tropis Pada Bangunan Kolonial Studi Kasus: Museum Perkebunan Indonesia. Jurnal Arsitektur Alur, 3(1).

Hardiman, G., & Sukawi, S. (2013). Adaptasi Tampilan Bangunan Kolonial Pada Iklim Tropis Lembab (Studi Kasus Bangunan Kantor Pt Kai Semarang). Modul, 13(1).

Nur Hidayat, A. Wahyu. (2021). Adaptasi Atap Dan Bukaan Pada Bangunan Kolonial. Agora:Jurnal Penelitian Dan Karya Ilmiah Arsitektur Usakti, 19(2).

eISSN 3030-5543

Https://Doi.Org/10.25105/Agora.V19i2.8890

Purnomo, H., Waani, J. O., & Wuisang, C. E. V. (2017). Gaya & Karakter Visual Arsitektur Kolonial Belanda Di Kawasan Benteng Oranje Ternate. Jurnal Media Matrasain, 14(1).

Tamimi, N., Fatimah, I. S., & Hadi, A. A. (2020). Tipologi Arsitektur Kolonial Di Indonesia. Vitruvian Jurnal Arsitektur Bangunan Dan Lingkungan, 10(1). Https://Doi.Org/10.22441/Vitruvian.2020.V10i1.006

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HISTORIC TIMBER REPAIR TECHNIQUES TYPOLOGY IN HERITAGE BUILDING CONSERVATION; AN ANALYSIS OF MALAYSIAN PRACTICE

Afzanizam Muhammad[1*], Siti Norlizaiha Harun[2], Yuhainis Abdul Talib[3], Norashikin Abdul Karim[4] & Nurrajwani Abdul Halim[5]

[1,2,3,4,5]Affiliation: Department of Built Environment Studies and Technology, College of Built Environment, Universiti Teknologi MARA, Perak Branch, 32610, Seri Iskandar, Perak, MALAYSIA

*Corresponding Author: afzan497@uitm.edu.my**

Abstract: Timber has been an integral part of Malaysia's architectural heritage, contributing to the uniqueness and historical significance of its heritage buildings. As the conservation of heritage structures gains importance, the practice of repairing historic timber elements becomes paramount. This study objectives are (i) to explores the methods, challenges, and significance of historic timber repairs in Malaysian heritage building conservation (ii) to investigates the practice of historic timber repairs in heritage building conservation in Malaysia and (iii) to examine the methods, materials, and approaches employed in historic timber repairs in Peninsular Malaysia. The use of timber in traditional Malaysian architecture has made a significant contribution to the country's architectural heritage. However, the diminishing supply of historic timber resources and traditional knowledge in timber restoration pose increasing challenges to the preservation of this heritage. The research also analyzes the challenges and issues faced by conservation professionals and contractors in their efforts to maintain the structural integrity and historical significance of heritage buildings that incorporate timber elements. Data was collected through an in-depth case study of historic timber repair projects conducted across Malaysia. Data analysis includes a comparison between traditional and modern methods used in restoration, as well as an assessment of the impact of repairs on the authenticity and historical value of the buildings. The findings of this study provide valuable insight into the practice of historic timber repairs in Malaysia and underscore the importance of preserving traditional knowledge in heritage conservation. It also offers practical guidance for conservation professionals and contractors involved in the restoration of historic timber buildings. This research emphasizes the necessity of ensuring that historic timber repairs in Malaysia are carried out meticulously to

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preserve the authenticity and historical value of the buildings while safeguarding the dwindling resources of timber.

***Keywords*:** Historic Timber, Replacement Timber, Repair Works, Building Conservation

INTRODUCTION

Timber has been an integral part of Malaysia's architectural heritage, contributing to the uniqueness and historical significance of the country's heritage buildings. As the conservation of heritage structures gains increasing attention, the practice of repairing historic timber elements has become crucial. Many significant heritage buildings in Malaysia have been restored through relocation for preservation by the National History Society and Museums, even before the establishment of the National Heritage Department (JWN) in 2006.

The initial awareness of the conservation movement in Malaysia began in 1945 when General Sir Gerald Templer delivered a keynote speech emphasizing the need to preserve arts and crafts.This initiative subsequently led to the formation of the Arts Council of Malaya (Peninsular Malaysia), successfully stimulating Malayan artists and craftsmen. The first heritage timber building restored in Malaysia was Istana Ampang Tinggi, an abandoned Malay timber palace that became the Negeri Sembilan Museum in 1953 (Md Ali, 2016).

To this day, conservation methods for buildings, particularly timber structures, continue to improve, seeking the most effective techniques from various perspectives. In addition to conservation concepts, cost-effectiveness is a critical factor in decision-making. However, this study focuses solely on the typology of historic timber repair techniques practiced in Malaysia. Before that, the literature review from scholars introduced three general approaches to repairs in heritage building conservation works.

The significance of optimally preserving historic timber lies in the fact that it holds historical information in physical form, serving as evidence of history, local identity, and local knowledge that is irreplaceable if lost. Moreover, it is indirectly essential for educational and research purposes for current and future generations. Therefore, the repair methods that best preserve and prolong the lifespan of these timber structures must be wisely decided upon by all stakeholders involved in the conservation of historic buildings.

Historic timber repair works are not considered the same as typical timber repairs or new construction. Based on conservation principles for historic timber structures, variability in intervention and compatibility between historic and new materials, increased use of non-invasive reinforcement materials, and reversible techniques have been observed (Feilden, 2003). Reinforcement at weak points, reversible repairs, and the preservation of structures considered valuable artefacts are the main reasons for introducing foreign materials.

In this research, an observation survey on-site, project document analysis, and interviews with experts were methods applied. Several historic timber building conservation projects in Malaysia were used as case studies. The repair techniques identified were categorized based on generalizations from suggestions by local scholars involved in the conservation of these timber buildings. The historic structure repair work is preceded by determining the best method, supported by experiments ranging from on-site simplicity to laboratory tests. While the goal of building investigation and historic building deterioration assessments is to produce perfect contract documents with comprehensive repair specifications, there are still shortcomings or disagreements regarding the scope of work that may arise during the

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project's implementation. This situation is inevitable in all conservation projects as the best methods are sought to align with conservation concepts. This has led to various repair techniques being proposed to address the different challenges encountered. Additionally, some decisions can only be made on-site during the ongoing conservation work, often depending on the conservator's judgment. These unexpected situations frequently occur during the dismantling or addition of structures to historic timber buildings. At this point, newly discovered significant historical evidence may lead to changes in conservation approaches and work instructions in the contract documents. In other words, the Scope of Work (SoW) in the contract becomes more detailed as on-site work progresses. The contract content can serve as a mechanism to guide the conservation work of the building. On-site actual situations often lead to changes in the original repair plan to accommodate newly discovered factors. The specifications for timber elements and ironmongeries are mostly determined after the structure is exposed or dismantled. Hidden parts can be observed in greater detail after being separated for repair. At this stage, the best approaches and repair techniques are determined by the conservator and contractors.

Based on the literature review and various cases abroad, it can be concluded that the approaches to repair are divided into three categories: i. Repair, ii. Reinforcement, and iii. Rebuilding. Among these three general approaches, the "repair approach" is the most recommended in building conservation as it best preserves the authenticity of the building's fabric. In contrast, the "rebuilding approach" is the last option when the heritage building has experienced serious damage or deterioration, making it impossible to save except by replicating it as closely as possible to the original. Meanwhile, based on previous records and case studies, the "reinforcement approach" is the most commonly practised, where consolidation interventions are required to prolong the building's function and integrity. However, the foreign materials used to consolidate the historic structure should be identifiable, such as through markings or different colors, and must be properly documented. (Larsen & Marstein, 2016).

1.1 Timber-to-Timber Repairs

In historic timber structure repairs, the process typically involves the replacement of new timber members and the reuse of salvaged timber. Replacement of original members ensures minimal intervention in the historic structure. Sometimes, consolidation with new timber components is added to the old structure, either o address the ageing of the original structure or to adapt to the new function of the building. In many situations, except for the dismantling and reconstruction of timber structures, the structural engineer's last resort is to cut off the damaged sections and splice them with replacement timber. This means the original timber, which was initially one piece, is now divided into two pieces, connected together.

The jointing techniques are usually conventional or non-traditional, depending on the function of the timber member. Essentially, the direction of the force borne by the member is taken into account, for instance, tensile force for columns and bending force in beams (D. Yeomans, 2003). In certain cases, structures that were built to remain intact may likely be damaged or broken if dismantled. Conservators take the initiative to apply jointing techniques by splicing new timber with the original in situ, to replace the original timber parts that cannot be salvaged due to severe deterioration.

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Replacement with new timber is usually carried out using the same species as the original. The use of other timber species but of the same or closest grade is considered an alternative when supply and cost become limiting factors. This approach is consistent with practices worldwide, as recommended by ICOMOS (2017). Park (2013) further adds that using the same timber species results in similar behaviour towards weathering and biodegradation. Thus, this ensures structural unity and perfection in design, while also allowing for uniform ageing processes in the future (Park, 2013).

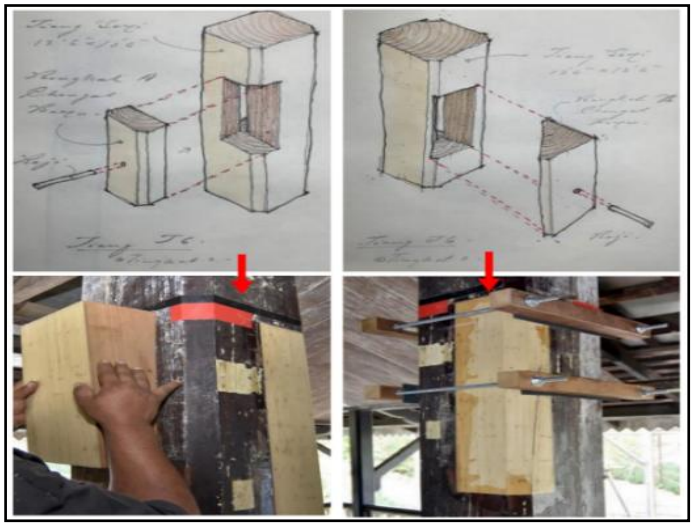


Figure 1: An example of timber-to-timber in-situ repair is planned using the carpenter's hand-drawn sketches. The joint between the replacement and historic timber columns is secured with adhesive and temporarily clamped until it cures. (Source: Ibrahim, 2019)

The concept of authenticity is always considered when restoring historic structures that face material shortages. The original techniques and methods are also applied or at least documented for reference (Jabatan Warisan Negara, 2017). However, when connecting new timber with original timber, jointing techniques must be determined on-site. Various techniques are employed to suit different on-site situations, such as the position of the member in the building and the forces it bears.

In Malaysia and many Asian countries, traditional buildings are constructed with future planning for dismantling and reinstallation. In Japan, this practice is rooted in religious beliefs (ICOMOS, 1994). In Malaysia, the practice of dismantling for reinstallation typically occurs due to changes in ownership or relocation to a new site. In the past, relocating a house was a social activity within the local community. In certain cases, when the new site was nearby, the house was lifted as a whole and moved in one piece with the help of a large group of villagers. However, today, dismantling and reinstallation are more commonly practised for conservation reasons (Muhammad et al., 2024). The reinstallation and relocation process involves minor repairs and refurbishment of the timber components. One of the main reasons for this is that the dismantling process can sometimes cause damage to both structural and non-structural components of the building (Muhammad et al., 2024).

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1.2 Timber with Foreign Material Reinforcement

In some cases, historic timber structure repairs involve the use of foreign materials, meaning that engineering techniques are applied to the original structural members to enhance their strength (Ross, 2002; Yeomans, 2008). These foreign materials are typically steel, in the form of plates, I-beams, or other sectional shapes. Steel is the most commonly used material in building conservation in Malaysia. There are records from abroad documenting the use of carbon fibre materials in timber repairs (Yeomans, 2008). Unlike timber-to-timber repairs, those involving foreign materials may require the involvement of other professionals such as engineers, blacksmiths, and others. Changes in the appearance of the building are expected but can be acceptable as long as they are minimal and comply with conservation principles(ICOMOS Singapore, 2017).

Several classifications of repair techniques have been introduced and are considered appropriate for addressing building issues. Most of the challenges in conservation work involve retaining the original elements of a building, even when their function has deteriorated. Therefore, retention is achieved through the reinforcement of weakened structures. Consolidation often involves the use of foreign materials as new structural members. New members using foreign materials are classified into several roles, as listed by various scholars (English Heritage, 2012; Insall, 1975; Larsen & Marstein, 2016; Russell, 2016; Yeomans, 2008):

i. **Reinforcement of the original timber**: This is typically done for simple reinforcement of timber members with insufficient load-bearing capacity and is also used to connect the new with the old, where parts of the members are cut due to damage/decay.
ii. **Replacement of the original timber**: This repair method is commonly used when timber members have decayed ends. The advantage of this approach is that less of the original material is lost, but the change in appearance is noticeable.
iii. **Supplementary support to the original timber**: Foreign materials either work independently as supplementary support to the original timber or function similarly to the original structure, altering its structural behaviour. However, such supplementary structures are not necessarily made from foreign materials (they may also be timber)



Figure 3: The additional structure consolidation by steel braces on the columns of Istana Satu was once relocated to the Malaysia National Museum compound (Author, 2019).

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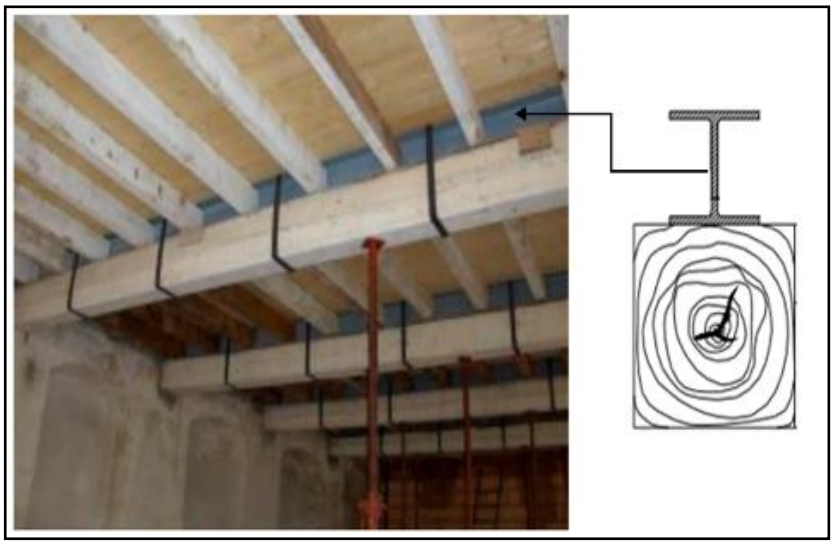


Figure 4: Reinforced Timber beam using steel I-beam on the compressed area. Modified from Corradi et al. (2019) and D. Yeomans (2003).

Apart from steel, epoxy resin has been used in the repair and reinforcement of historic timber since the 1960s in Europe (Insall, 1975). Insall (1975) further mentions that epoxy resin possesses properties such as low curing shrinkage, good chemical resistance, strong adhesion, the ability to fill small gaps or cracks larger than 4mm, and sufficient strength to replace timber. In general, resin performs better than timber in joints. When maximum load is applied to a joint, cracks typically occur in the timber rather than in the resin adhesive. Epoxy resin can be used as an adhesive, a consolidant, and a replacement material for decayed timber (Ross, 2002). Consolidation with epoxy resin is achieved by controlling its viscosity, allowing it to penetrate the timber and fill cracks and gaps in the timber patina. Repair techniques involving resin are often conducted on-site (in-situ). Timber structure reinforcement using epoxy resin does not experience significant deterioration over time. However, its drawback is the dark appearance of the epoxy resin, which becomes visibly prominent. Timber reinforcement with epoxy resin is often combined with other reinforcing or replacement materials, such as stainless steel, to complement partially decayed timber components, usually occurring at the ends (Figure 7).



Figure 6: The Epoxy resin repair to the end of a beam consolidated and replaced the missing part (English Heritage, 2012).

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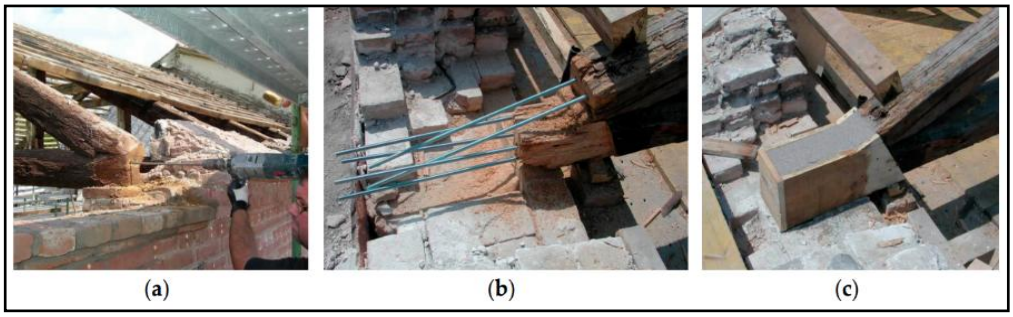


Figure 7: Stainless steel rods reinforced into the rafter. (a) preparing the holes to insert the rods in timber; (b) Stainless steel rods in their position; (c) resin casting in custom temporary moss (Corradi et al., 2019).

Based on the case studies conducted, there are no records of conservation repairs involving the use of epoxy resin. In Malaysia, resin has not been a preferred choice, possibly due to contractors' limited understanding of the material. Additionally, carpenters often rely on more familiar materials and their own trusted methods for timber work. According to English Heritage (2012), temperatures above 40°C can cause the resin to soften and lose its strength, making this material less suitable for use in hot climates. Many buildings experience high temperatures in roof spaces. However, there are records of repair works using natural resin, serving only as a filler to tidy up joints and seal holes or cracks in the timber while adding durability in high-humidity environments (Saod, 2019). The use of natural resin, in this case, does not involve timber reinforcement but rather serves as a refurbishment or minor touch-up.

1.3 Replicate and Rebuilt as Original

A replica is an exact copy of a building or part of it (Orbasli, 2008). In timber building conservation, the replication of building parts or, in major works, the rebuilding of the whole or part of the building is considered a last-resort conservation approach. Ideally, replication and rebuilding work should use the same timber species and design profile as the original. Similar remaining parts of the building are often used as samples for replication. Additionally, historical records such as blueprints and photographs can be other references to guide the process.

Replication work is conducted when the timber members have deteriorated to the point where they can no longer function structurally and cannot be effectively repaired (ICOMOS Singapore, 2019a). Apart from replacing damaged parts of the building, they are sometimes created for display purposes to save vulnerable values. Such decisions are based on value judgments, where the craftsmanship is potentially facing threats of severe weathering, theft or vandalism threats. The original parts were moved to a safer museum condition to preserve and still be appreciated (Orbasli, 2008). Although replication does not represent the authenticity of the heritage building in many aspects, it complements the architecture by restoring building's original appearance. Physical authenticity, such as replaced materials, copied styles, and possibly craftsmanship, can be replicated. However, the historical value, memories, and embedded evidence are lost. Thus, replication is often seen as a last resort in conservation efforts.

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Figure 8: Some of the replaced timber lattice members, which remain unfinished, were replicated based on the original ones that are still intact (Author, 2017).

Aside from replication work on building parts, the complete or partial rebuilding of a destroyed building is also considered a last-resort option to preserve historical and cultural evidence. Rebuilding should, as much as possible, replicate the original appearance of the building based on remaining information such as photographs, old blueprints, and oral accounts from senior citizens. Timber buildings are constantly exposed to the risk of fire and tend to deteriorate more quickly than masonry buildings. Based on experiences in Malaysia, the Sultan Suleiman Club Building in Kuala Lumpur is one example of a timber structure that was partially rebuilt in 2007. The Sultan Suleiman Club, established in 1909 in Kampung Baru, Kuala Lumpur, holds historical importance as the oldest and most prominent club specifically founded for the Malay community (Jafri Merican Architect, 2007).

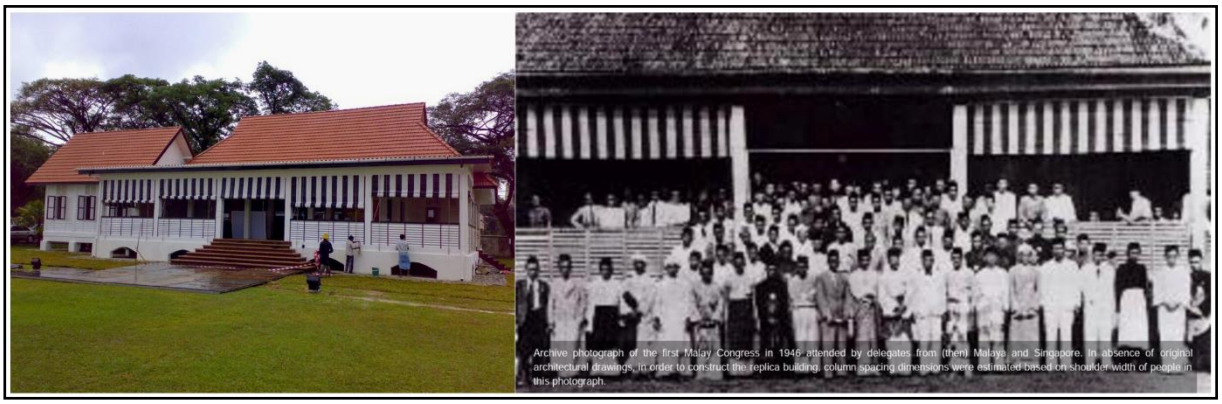


Figure 9: One of the timber blocks of the Sultan Suleiman Club, rebuilt in 2007, referred to an old photograph from 1947 to estimate the scale of the building (Jafri Merican Architect, 2007).

METHODOLOGY

The methodology used to identify historic timber repair techniques in the conservation of Malaysian heritage buildings primarily involves analyzing contract documents, implementation records, and final project reports. These three documents contain

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information about the repair work on timber elements across three phases of the repair process. The first phase involves identifying the type of timber damage in the building and determining the necessary repair work by analyzing the contract documents. The second phase focuses on the implementation of the repair work outlined in the contract documents. This phase is the most crucial for data collection in this research, as it includes analyzing the repair methods applied. During this phase, several variations of repair work were identified, which were decided on-site during the conservation project. This occurred due to two main reasons: firstly, the discovery of newly found damage on-site that was not mentioned in the contract documents, and secondly, the adoption of improved and more efficient repair methods agreed upon by all parties involved. Typically, these variations aim to ensure minimal intervention in the sensitive old structure. The third phase involves analyzing the final project report to confirm that the repair work was completed successfully and that the outcome met the goal of preserving the authenticity of the historic timber structure. Additionally, an in-depth observational survey is conducted throughout the conservation project's execution, and interviews with the respective conservators are carried out to validate the data obtained from document analysis and observational surveys. A total of five heritage buildings in Malaysia have been selected as case studies. Based on the survey, several typical timber repair techniques applied in Malaysia have been identified.

FINDINGS AND DISCUSSION

Based on the survey, it was found that the repair techniques used are closely related to the type of damage sustained and the level of deterioration of the structure or timber components in a particular heritage building. In Malaysia, various factors contribute to the degradation of historic timber. The most common forms of damage are due to prolonged exposure to moisture and termite attacks. Furthermore, the selection of timber species used in construction varies. More durable and high-strength timber species are used for the main structural elements of a building, such as columns and beams, while timber with moderate strength is used for non-structural elements like doors, windows, and walls. There are three main approaches to timber repair in heritage conservation, namely Repair, Reinforcement, and Rebuilding (Larsen & Marstein, 2016; Yeomans, 2008).

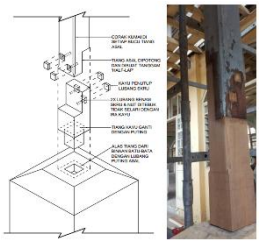
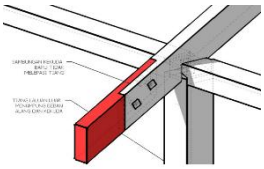
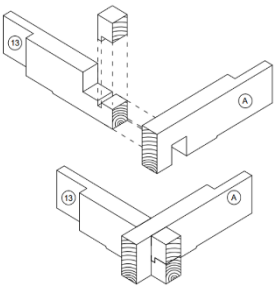
i. **Repair Approach** involves replacing damaged timber with new timber or refurbishing members that are still sound.
ii. **Reinforcement Approach** involves the introduction of foreign materials to enhance the structural integrity of original members that are weak or have failed. Based on findings from all three case studies, steel components were to reinforce original members that were either weakened or damaged.
iii. **Rebuilding Approach** is the last resort for timber members that are severely damaged and beyond repair. This reconstruction is based on documentary evidence such as original building plans, historical photographs, and memories. In Malaysian conservation practices, it is common to replace a timber member by replicating another member that remains in the building and is believed to have the same profile.

Through the case study research conducted, these three historic timber repair approaches have been further detailed into specific repair techniques that are specific to the Malaysian

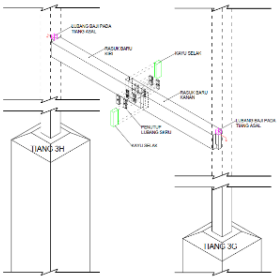
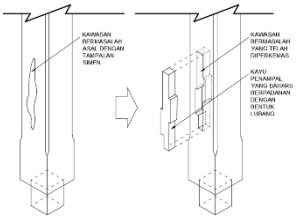
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context. The techniques obtained from the survey conducted on all case studies are addressed in Table 1.

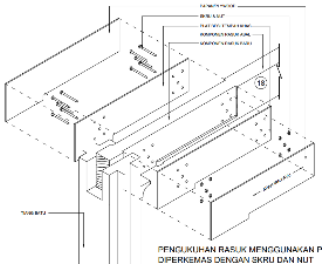
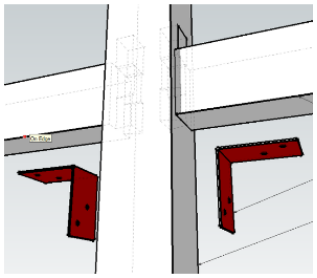
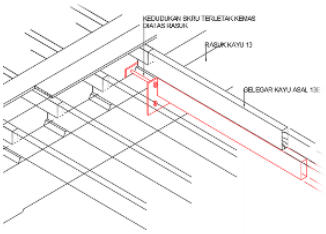
Table 1: Historic Timber Repair Approaches and Techniques Practiced in Heritage Building Conservation in Malaysia

Historic Timber Repair Approaches From Literature Review	**Historic Timber Repair Techniques Obtained From The Research Surveys**		**Recommended Situation to Apply**	**Examples of Repair Techniques Found in Case Studies**	
Repair: Timber-to-timber repair using the same species or the same group of replacement timber as the original (ICOMOS, 2017; Park, 2013; Zwerger, 2012).	**i**	**Refurbish /Refinish**	Applied on good condition parts with minor repairs, resurfaced and refinished	Resurfacing work on door leaves 	The old finish is scraped off to prepare the surface for a new layer..
				Refining with natural resin on a threshold (*bendul*) 	The jointing gap, small hole and crack are refined with natural resin mixed with wood dust as putty.
	ii	**Cut & Joint**	Applied to replace the original partially decayed parts with new timber by carpentry jointing.	Replacing the rotten column part 	Rotten timber was found at the joint between the column and the concrete stump. The joint was repaired by cutting away the decayed section and connecting it with new timber. The joint was fastened with steel bolts, which were then concealed.
				Replacing the roof truss ends. 	The decayed section at the end of the roof truss was cut off and replaced with new timber (in red), matched to the original species and dimensions.
	iii	**Construction Modification**	Applied when an alternative construction method is necessary to receive the replacement timber.	Jointing modification on the attached beams 	The original beam, which was severely damaged, needed to be replaced with new timber. The connection between the two beams was originally in the form of a hook. To minimize structural intervention, the replacement was carried out in-situ, and modifications to the hook connection were necessary because the installation orientation differed from the original construction.

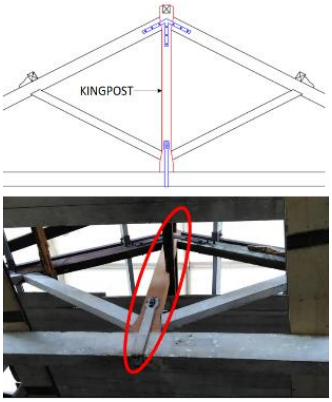
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				New jointing was created on the beam 	The decayed beam was originally a single piece with both ends meant to be embedded in the columns. The beam had to be made in two parts with a joint in the middle. The joint was tightened with timber keys (green) and fastened with four bolts. The modification was necessary because the beam was positioned between two fixed columns. The columns were not removed to minimize structural intervention, which could have caused damage to other timber members attached to them.
	Iv	**Slicing In**	Applied on a partially or internally decayed part. Commonly in situ repair work replaces the decayed portion with new timber by inlay.	Decayed column repair 	The decayed section was removed and shaped to fit the replacement timber. The replacement timber must be of the same type, with the grain orientation aligned with the original timber to ensure long-term durability.
				Slicing in new timber at end joint. 	Slicing new timber into the joint of the original structure strengthens the connection while replacing the decayed portion.
	v	**Relocate /Reinstall**	Decisions are made when a building needs to be removed or repositioned. Some repairs are necessary.	Dragging a house within a short distance.  	The building is moved to a new location using a prepared pipe track (top) and pulled with a chain hoist (below). This technique is only used for relocating buildings over very short distances.

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				House lifting by manpower 	The cooperative lifting activity is conducted to relocate the house to a new site. First, non-structural elements such as doors and windows are temporarily removed to reduce the weight of the house.
				Dismantle the structure for reinstallation. 	The components of the house are dismantled one by one to facilitate transportation to the new site for reassembly. Each removed component is marked for guidance during reinstallation.
Reinforcement: Engineered techniques with foreign material applied to the original structure member to improve the strength performance (Ross, 2002; Yeomans, 2008).	**vi**	**Foreign Material Reinforcement**	The historic timber consolidation by steel/ foreign components attached/ reinforced on the weakened timber.	Steel plate reinforcement 	Custom steel plates were clamped and fastened with nuts on both sides of the cracked beam for reinforcement. This technique avoids replacing the beam, which could cause more severe structural damage.
	vii	**Transferring Loads /Support**	Additional component support takes over the loads when the original timber structure cannot perform.	Additional steel brackets support 	Steel L-brackets (red) are attached with screws to transfer the building load from the beam to the column, bypassing the mortise-tenon joint, which is suspected to be weakened. The purpose is to avoid damaging the joint.
				Additional rectangular hollow section steel 	An additional rectangular steel section (red) is attached to the original timber beam to provide extra strength to the joist, allowing it to support the new building function with the added load.

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Rebuilt: An exact copy of a building or part of it. Replacement using similar timber species and grain (ICOMOS Singapore, 2019b; Orbasli, 2008).	**viii**	**Replication**	This method is applied when the original is damaged or missing. Replace the original part with the new one by referring to the remains as a sample or using available evidence such as photographs, old blueprints and old citizen's information.	Replication of rotten kingpost. 	The rotten roof kingpost (red) has been replaced with new timber from the same species. The dimensions and design are replicated from the original kingpost. The original ironmongery (blue) has been reused. The replacement timber is from the same species.
				Rebuilt of the staircase handrail and balustrade. 	The rotten handrailing and balustrade were rebuilt based on the original design. Several components that were still in good condition were reused. The replacement timber is from the same species.

CONCLUSION

In conclusion, this research sheds light on the practice of historic timber repairs in heritage building conservation within the Malaysian context. Timber has played a pivotal role in Malaysia's architectural heritage, contributing significantly to the country's cultural and historical identity. However, the preservation of this heritage faces challenges stemming from the diminishing supply of historic timber resources and the erosion of traditional knowledge in timber restoration. This study explores into the various methods, materials, and approaches employed in historic timber repairs in Malaysia. It also scrutinizes the obstacles and issues encountered by conservation professionals and contractors in their endeavours to safeguard the structural integrity and historical significance of heritage buildings adorned with timber elements.

Through an in-depth survey of historic timber repair projects conducted throughout Malaysia, this research has unearthed a profound relationship between the choice of repair techniques and the specific types of damage experienced by timber structures or components within heritage buildings. The primary culprits of timber damage in Malaysia are long-term humidity exposure and termite infestation.

In the realm of historic timber repairs, three principal approaches emerge i. Repair, ii. Reinforcement, and iii. Rebuilding. Repair techniques involve the replacement of deteriorated timber with new timber or the restoration of structurally sound elements. Reinforcement necessitates the integration of foreign materials to bolster the structural integrity of weakened or failed original members. The survey findings reveal that steel components have been employed to reinforce compromised original members. As a last resort, the rebuilding

approach is invoked for timber elements that have suffered irreparable deterioration and damage.

These three overarching repair approaches have been further dissected into specific repair techniques, with epoxy resin techniques being a less common practice in Malaysia. Nonetheless, certain cases have seen the utilization of natural resin as a putty to fill gaps and nail holes.

This research underscores the vital importance of preserving traditional knowledge in heritage conservation. It serves as a valuable resource for conservation professionals and contractors engaged in the restoration of historic timber buildings. Furthermore, it emphasizes the imperative of conducting meticulous historic timber repairs in Malaysia to uphold the authenticity and historical value of these buildings while safeguarding the dwindling resources of historic timber. In the face of contemporary challenges and changing conservation paradigms, the preservation of Malaysia's rich architectural heritage continues to be a pertinent and demanding endeavour, requiring a delicate balance between modern techniques and traditional wisdom.

REFERENCES

Corradi, M., Osofero, A. I., & Borri, A. (2019). Repair and Reinforcement of Historic Timber Structures with Stainless Steel — A Review. *Multidisciplinary Digital Publishing Institute*, 1–23. https://doi.org/10.3390/met9010106

English Heritage. (2012). *Practical Building Conservation: Timber*. Routledge.

Feilden, B. M. (2003). *Conservation of Historic Building* (3rd Editio). Elservier & Architectural Press.

Ibrahim, A. (2019). *Seminar Pemuliharaan Istana Lama Seri Menanti (Muzium Diraja)*.

ICOMOS. (1994). *The Nara Document on Authenticity (1994)*. 46–48.

ICOMOS. (2017). *Principles for the Wooden Built Heritage (2017)*. 1–6.

ICOMOS Singapore. (2017). Conservation technical handbook: Introduction. *Conservation Technical Handbook*, *1*.

ICOMOS Singapore. (2019a). Interior Elements. *Conservation Technical Handbook*, *6*.

ICOMOS Singapore. (2019b). Structure. *Conservation Technical Handbook*, *4*.

Insall, D. W. (1975). *The Care of Old Buildings Today: A Practical Guide*. The Architectural Press.

Jabatan Warisan Negara. (2017). *Garis Panduan Pemuliharaan Bangunan Warisan*.

Jafri Merican Architect. (2007). *Kelab Sultan Suleiman, Kuala Lumpur*. https://jafrimerican.com/kelab-sultan-suleiman-kuala-lumpur/

Larsen, K. E., & Marstein, N. (2016). *Conservation of Historic Timber Structures*.

Md Ali, Z. (2016). *Mubin Sheppard: Pioneering Works in Architectural Conservation in Malaysia*. University Of Malaya Press.

Muhammad, A., Saod, S. M., Karim, N. A., & Halim, N. A. (2024). The Framework For Dismantling And Reinstalling Works Of Malay Traditional Timber Buildings Based On Malaysian Case Studies. *The 13th Regional Symposium of The Malay Archipelago & International Lecture Series on Vernacular Architechture*.

Orbasli, A. (2008). *Architectural Conservation*. Blackwell Science.

eISSN 3030-5543

Park, T. L. (2013). Process of architectural wooden preservation in Japan. *WIT Transactions on The Built Environment*, *131*(Vol 131), 491–502. https://doi.org/10.2495/STR130411

Ross, P. (2002). Appraisal and repair of timber structures. In *Structural Engineer*. Thomas Telford. https://doi.org/10.1680/arts.61781

Russell, R. (2016). *Structural Timber Repairs*. 3–5. http://www.buildingconservation.com/articles/structural-timber-repairs/structural-timber-repairs.htm

Saod, S. M. (2019). *Pemuliharaan dan menaiktaraf istana lama seri menanti* (Issue April).

Yeomans, D. (2003). *The Repair of Historic Timber Structure*. Thomas Telford.

Yeomans, D. T. (2008). Repairs to historic timber structures: changing attitudes and knowledge. *Structural Analysis of Historic Construction: Preserving Safety and Significance: Proceedings of the Sixth International Conference on Structural Analysis of Historic Construction, 2-4 July 2008, Bath, United Kingdom*, 63–70.

Zwerger, K. (2012). *Wood and Wood Joints* (2nd ed.). birkhauser.

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THE EVOLUTION OF PLANTS AND LANDSCAPES IN TRADITIONAL MALAY HOUSES OF RURAL PERAK

Nur Huzeima Mohd Hussain[1], Ahmad Zamil Zakaria[2*], Atikah Raihanah Amir[3]

[1,2,3]Department of Built Environment Studies and Technology, College of Built Environment, Universiti Teknologi MARA, Perak Branch, 32610, Seri Iskandar, Perak, MALAYSIA

*Corresponding: zamil227@uitm.edu.my **

Abstract: The transformation of traditional Malay house landscapes in rural Perak has become increasingly significant in light of rapid urbanization, socio-economic shifts, and environmental concerns. This study aims to analyze the evolution of plant selection and landscape changes within these dwellings. By examining both historical and contemporary practices, the research seeks to identify key plant species, their roles, and the factors influencing landscape transformations from years before 2010 to after 2020. Through field surveys, archival research, and interviews with local residents, the study investigates how traditional plant arrangements have adapted to socio-economic, cultural, and environmental shifts. Findings reveal that plants serve multiple functions, such as providing food sources, medicinal benefits, shade, and privacy, while also playing a role in cultural expression and environmental adaptation. Traditionally cultivated species include *Tapioca* spp., *Cocos nucifera*, banana trees (*Musa* spp.), and *pegaga* (*Hydrocotile asiatica*). However, due to urbanization, economic pressures, and ecological concerns, plant selection and garden layouts have undergone transformations over time. This study further examines the socio-cultural and ecological factors influencing these changes, including modernization, the pandemic, and lifestyle shifts. The research emphasizes the importance of preserving traditional landscape elements to maintain cultural identity and promote environmental sustainability. By bridging past and present landscaping practices, this study provides insights into integrating traditional horticulture with contemporary rural development. Ultimately, this research contributes to understanding the interplay between traditional architecture and horticulture, as well as the preservation of cultural heritage and the creation of sustainable rural landscapes.

***Keywords*:** plants, landscape, evolution, Malay, Rural Perak

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INTRODUCTION

The changes in landscape typology reflect an ongoing evolution where the attachment to cultural traditions does not diminish the potential of plants to serve multiple, valuable roles within rural communities. Rather, these plants continue to play a crucial part in sustaining and enhancing key areas of rural life.

This research underscores the importance of recognizing and preserving traditional landscape elements as part of efforts to maintain cultural identity and promote environmental sustainability in rural Perak. By bridging past and present landscaping practices, the study provides insights into how traditional horticulture can be integrated with contemporary rural development, ensuring that the cultural and ecological values of these landscapes are preserved.

THE MALAY LANDSCAPE EVOLUTION

Traditionally, Malay houses in rural Perak were designed to harmonize with their natural surroundings. Gardens were not only functional, providing food and medicinal plants, but also aesthetically pleasing with ornamental species. Overstorey trees such as *Cocos nucifera* (kelapa) and *Mangifera indica* (mempelam) were commonly grown for their economic value, while understorey plants like *Pandanus amaryllifolius* (pandan) and *Murraya koenigii* (pokok kari) added to the household's self-sufficiency and aesthetic appeal.

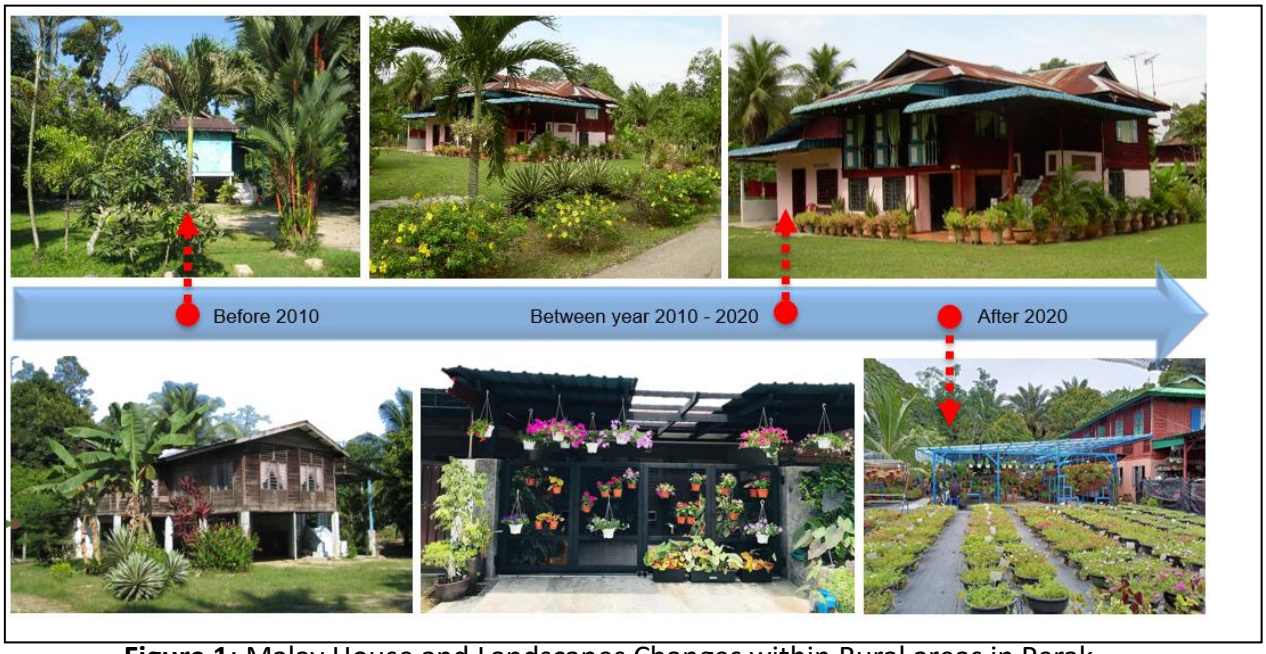


Figure 1: Malay House and Landscapes Changes within Rural areas in Perak

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However, the rise of urbanization in Perak, coupled with the increasing commercialization of agriculture, has altered the structure of these traditional landscapes. The demand for space in rural areas has led to smaller plots of land for planting, resulting in the decline of large overstorey trees. As more people seek to maximize their land for commercial crops, the landscape around Malay houses has become increasingly dominated by smaller, high-yielding plants such as vegetables, herbs, and fruit trees that cater to both subsistence needs and local markets.

Furthermore, the shift towards more modern agricultural practices has led to the introduction of non-traditional plant species, often cultivated for commercial purposes, which further transforms the local landscape.

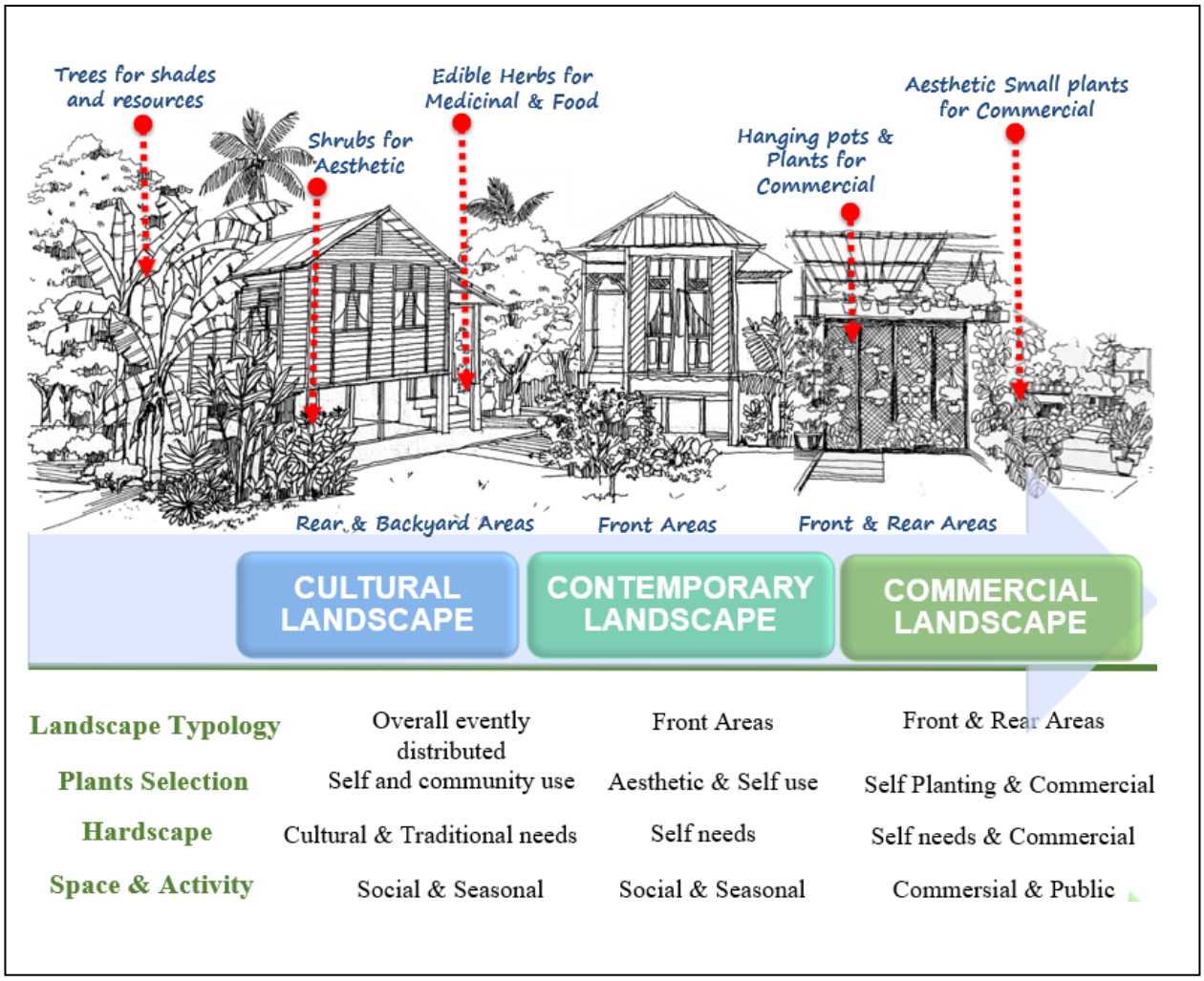


Figure 2: Analysis of Landscape Evolution of the Malay House Rural Perak

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Nevertheless, the evolution in plants and landscape typology shows that landscape attachment with cultural-tradition does not diminish the plants' potentials and roles in sustaining: (i) high commercialization value, (ii) significant tourism opportunities, (iii) showcasing heritage identity, (iv) self-subsistence; and (v) boosting local economic benefits for future resilient.

PLANT SPECIES IN TRADITIONAL MALAY HOUSES OF RURAL PERAK

The analysis illustrates that the commercial landscape has decreased in plants profile with only 10% of overstorey trees, 30% of understorey trees and the majority of 60% are the shrubs and herbs that serves as aesthetical, food and medicinal plants in fulfilling self and commercial demands.

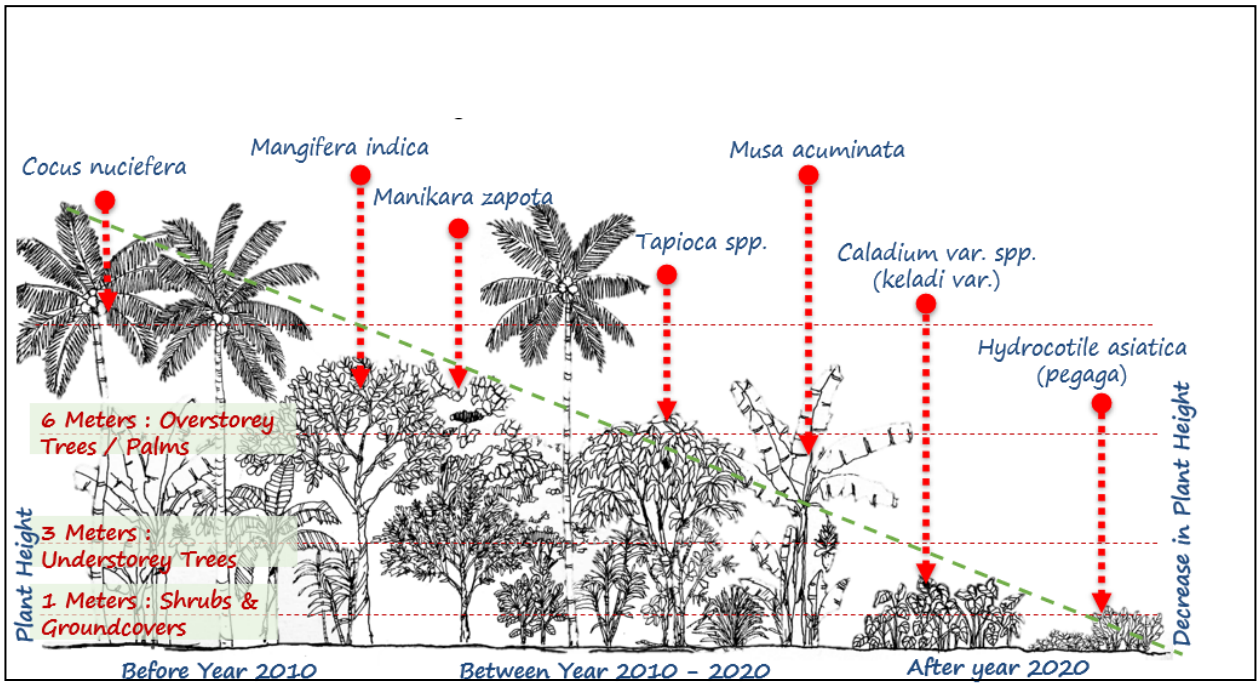


Figure 3: Plants Profile Analysis of The Malay Landscape in Rural Perak

The analysis reveals a significant shift in the landscape composition of rural Perak, highlighting a decrease in the diversity of plants traditionally associated with commercial landscapes. The study shows that the profile of plant species has undergone a transformation, where the once prominent overstorey trees now account for only 10% of the total plant species. These trees, which historically more than 6 meter height, provided critical resources such as timber, fruits, and materials for cultural practices, are becoming increasingly scarce as urbanization and modern land use practices take precedence.

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In contrast, the proportion of understorey trees with the height between 1 to 3 meters has shown a significant increased, comprising 30% of the landscape plant profile. These trees, though less dominant than overstorey species, continue to serve vital roles in maintaining ecological balance by providing shade, supporting biodiversity, and offering various food and medicinal resources. While the understorey trees are still present, namely *Mangifera indica*, *Manikara zapota* and *Tapioca spp*.; their functions have shifted over time, influenced by changes in land use and the growing demands for more economically viable crops.

Interestingly, the largest shift in the plant profile is observed in the dominance of shrubs and herbs, which now make up 60% of the landscape. These plants are primarily valued for their aesthetic, food, and medicinal functions, meeting both self-subsistence and commercial needs. Shrubs and herbs, such as pandan leaves (*Pandanus amaryllifolius*), lemongrass (C*ymbopogon citratus*), and turmeric (*Curcuma longa*), continue to be integral to daily life in rural communities. These plants are not only essential for local consumption but also hold economic value through their commercial trade in local markets. These plants cater to the increasing demand for fresh, organic produce and herbal remedies, reflecting a shift in both consumer preferences and agricultural trends towards more sustainable, diversified plant use.

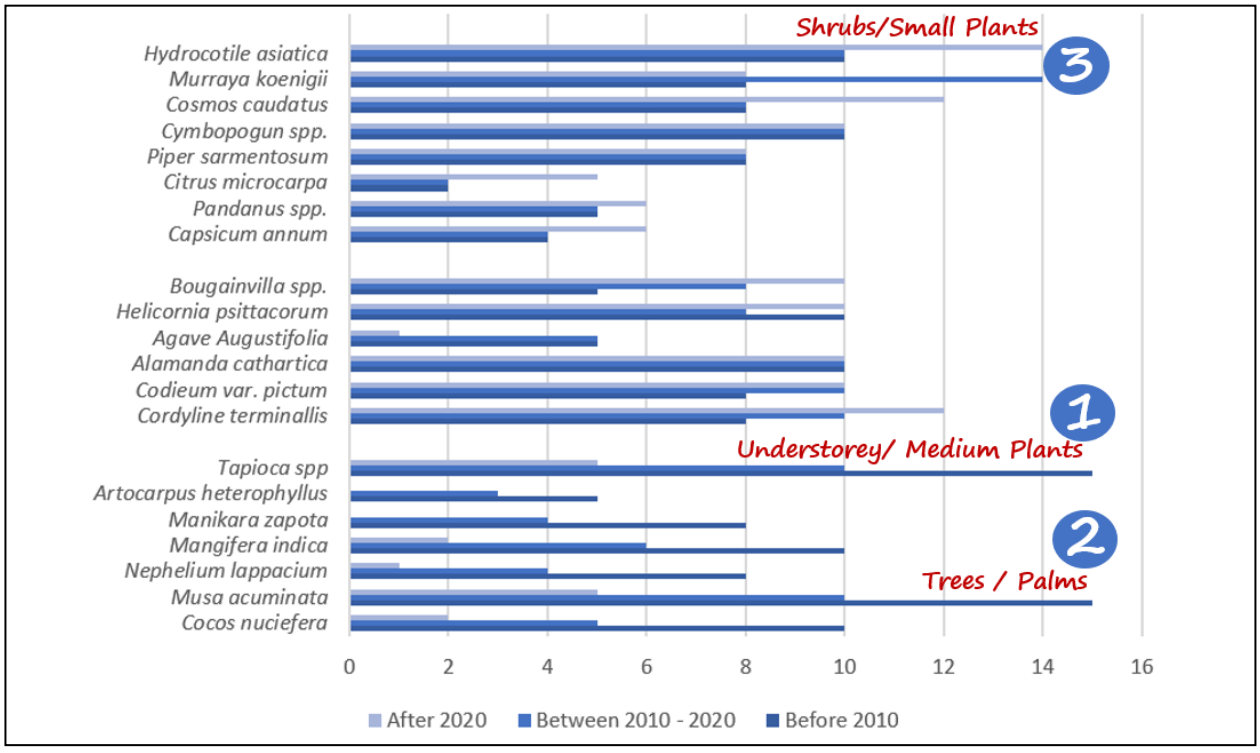


Figure 4: Plant Frequency in Landscape Profile between before year 2010 to after year 2020

Figure 4 illustrates the changing plant composition in rural Perak, reflecting shifts in landscape preferences and constraints. The dominance of shrubs and herbs represents a significant

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departure from the traditional reliance on larger, high-value overstorey trees, indicating a broader trend towards smaller, more adaptable plant species. This shift is likely driven by several factors, including limited land availability for large-scale tree cultivation, the increasing commercialization of agriculture, and the growing demand for plants with diverse uses in food, medicine, and landscaping. The 2019 pandemic further accelerated this shift, as limited space led households to prioritize edible plants like *Hydrocotyle asiatica* (pegaga), *Murraya koenigii* (pokok kari), *Manihot esculenta* (ubi kayu), and *Musa acuminata* (pisang) for food security. At the same time, ornamental species such as *Cordyline terminalis* (jenjuang), *Allamanda cathartica* (bunga loceng), and *Codiaeum variegatum* (puding) remained popular, reflecting an ongoing balance between aesthetic values and practical needs.

While the reduction in overstorey trees and the rise of shrubs and herbs may reflect changing agricultural priorities and land-use patterns, it also highlights the evolving relationship between rural communities and their landscapes. These plants continue to serve crucial roles in maintaining the cultural identity of the region while meeting the growing commercial demands of a modern economy. The analysis demonstrates that despite the shift in plant types, traditional landscapes in rural Perak remain resilient, adaptable, and capable of fulfilling both self-sustenance and economic goals.

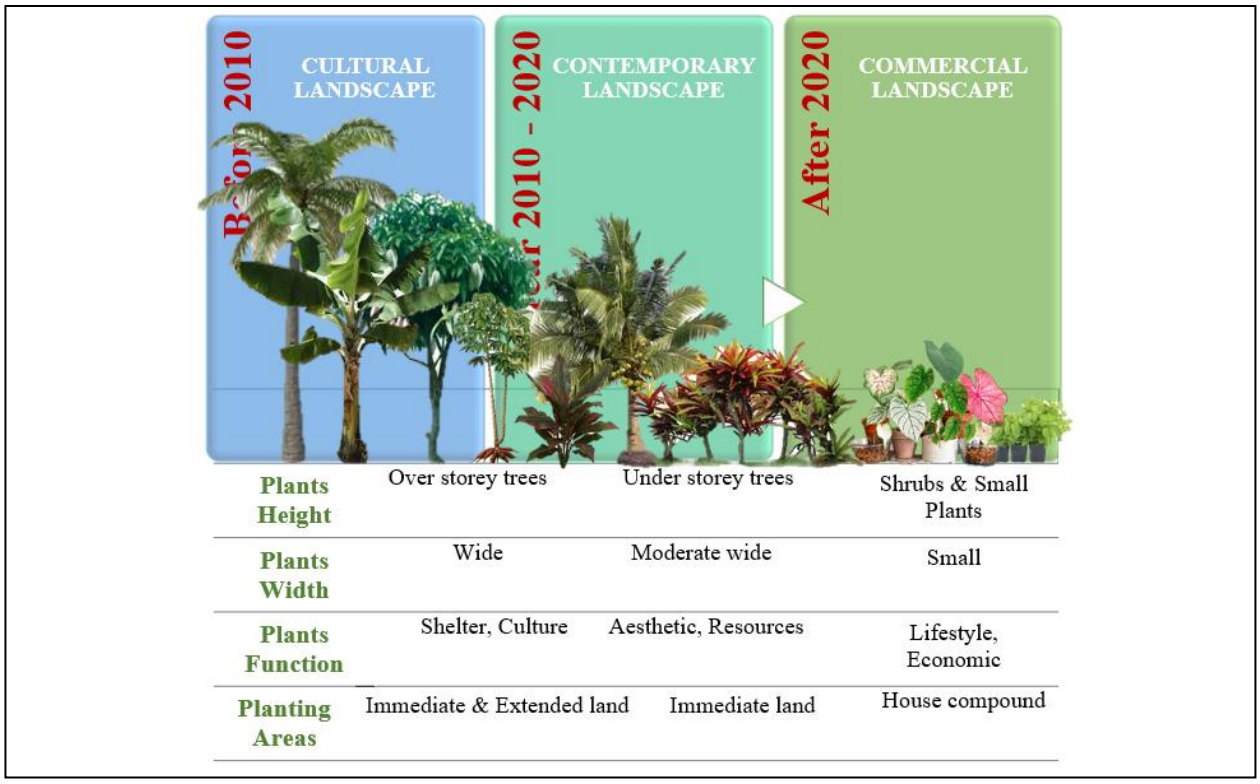


Figure 5: Summary of Plants Evolution of the Malay Landscape in Rural Perak

The plant evolution as summarise in Figure 5 shows a shift from large overstorey trees like *Cocos nucifera* (kelapa) and *Mangifera indica* (mempelam) to smaller, adaptable species such as *Cordyline spp*. and *Codiaeum variegatum* to *Hydrocotyle asiatica* (pegaga) and *Murraya koenigii* (pokok kari). These smaller plants, including edible species like *Manihot esculenta* (ubi kayu) and *Musa acuminata* (pisang), are increasingly favored due to their ability to thrive in limited spaces and serve multiple functions like food and medicine. In addition, the life changes during the MCO, has rised more decorative plants namely the *Caladium* species that portray vibrant foliage and ornamental value, as people sought to enhance their home environments. Thus, with reduced land availability, compact plants are now more common in home gardens, reflecting a trend toward practicality and adaptability in modern rural landscapes.

CONCLUSIONS

In conclusions, understanding both cultural and contemporary changes provides valuable insights into the evolution of traditional Malay house landscapes in rural Perak. This study demonstrates that traditional plants and design elements remain vital, adapting to meet contemporary needs while preserving cultural heritage. As landscapes and culture are deeply intertwined with human life, they play a crucial role in fostering resilience and adaptability in future generations. Moving forward, the ongoing interaction between people and their environment will continue to shape and sustain the cultural landscapes of the Malay house in Perak, ensuring their relevance in a rapidly changing world.

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REFERENCES

Adnan, N., & Othman, N. (2012). The relationship between plants and the Malay culture. *Procedia-Social and Behavioral Sciences*, 42, 231-241

Harun, N. Z., Mohd Ariffin, N. A., & Abdullah, F. (2017). Changes and Threats in the Preservation of the traditional Malay Landscape, Planning Malaysia, 15(4). https://doi.org/10.21837/pm.v15i4.318

Hussain, N. H. M., Nayan, N. M., Ahmad, S., & Salleh, I. H. (2022). Landscape and Plants Profile Analysis in Rural Perak. *Planning Malaysia Journal*, 20.

Hussain, N. H. M., & Ahmad, S. (2017). Malay Landscape: Typical design for Contemporary House at Desa Wawasan. *AJEBs*, 2(2), 93-103.

Hussain, N. H. M., Zakaria, A. Z., Ahmad, S., & Salleh, I. H. (2021). Kampong, Land & its Capacity Towards Subsistence Living. Malaysian Journal of Sustainable Environment, 8(3), 143-156.

Ismail, N. A., & Ariffin, N. F. M. (2015). Longing for culture and nature: The Malay Rural Cultural Landscape 'Desa Tercinta'. Jurnal Teknologi, 75(9).Malaysia, 16(5). https://doi.org/10.21837/pm.v16i5.438

Raja Abdul Kadir, T. A. Q., Jahn Kassim, P. S., Abdul Latif, N. S., & Md Shariff, H. (2020). Identifying The Parameters of the Malay Classical Architecture Planning Malaysia, 18(12). https://doi.org/10.21837/pm.v18i12.743

Salleh, I. H., Rashid, M. S. A., & Sakip, S. R. M. (2016). Malay garden concept from the traditional Malay landscape design. Procedia-Social Behavioral Sciences, 222, 548-556.

Zakaria, A. Z., Salleh, I. H., & Abd Rashid, M. (2012). Plants present in the ancient Malay garden according to old manuscripts and their effects on the formation of Malay garden design model in Malaysia.

Zakaria, A. Z., Hussain, N. H. M., & Ahmad, S. (2021). The Malay Cultural Landscape of Kutai Houses. *Malaysian Journal of Sustainable Environment*, 8(3), 37-56.

Zakaria, A. Z., Hussain N.H.M., Ahmad S (2020). The Landscape element layout: A case study of Kutai Houses in Perak Tengah District. *SIMPORA XI 2020 Procedings*, UiTM Perak, Malaysia

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REVITALIZING IHSANIAH ISKANDARIAH MOSQUE: HERITAGE CONSERVATION, CHALLENGES, AND OPPORTUNITIES

Wan Faida Wan Mohd Azmi[1]*, Syed Abdul Haris Syed Mustapa[2], Lilawati Ab Wahab[3], Mohd Nurfaisal Baharuddin[4], Muhammad Suhaimi Musa[5]

[1,2,3,4,5] *Department of Built Environment Studies and Technology, College of Built Environment, Universiti Teknologi MARA, Perak Branch, 32610, Seri Iskandar, Perak, MALAYSIA*

**Corresponding Author: wfaida@uitm.edu.my*

Abstract: The Ihsaniah Iskandariah Mosque in Kampung Kuala Dal, Perak, is a significant cultural and architectural landmark, built in 1936. The mosque is renowned for its unique bamboo panel walls (*kelarai*) and its fusion of traditional Malay craftsmanship with Islamic architectural influences. However, the mosque faces challenges of structural deterioration, especially with its bamboo walls succumbing to environmental damage and pests, and it is underutilized by the local community. Despite conservation efforts, the mosque remains mostly inactive, used only for occasional religious events. The revitalization of the mosque is essential for preserving its historical and cultural value while transforming it into a vibrant community hub. Strategies for this include preserving its architectural integrity through eco-friendly materials and techniques, such as thermochemical compression densification, to enhance durability. Furthermore, fostering community engagement through educational workshops, cultural events, and heritage tours can help strengthen the mosque's role as a space for learning, cultural exchange, and tourism. Revitalization can drive local economic growth and tourism while deepening community pride and intergenerational cultural connections. By involving the community and leveraging modern technologies, the mosque can thrive as a living heritage site.

***Keywords*:** Heritage, Mosque, Cultural Engagement

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INTRODUCTION

Various forms of mosque architecture have been built across the country since Islam began to gain a foothold in Malaya centuries ago. Behind the construction of each mosque lies a unique history, often connected to the sultanate, religious figures, and the colonial period. Each mosque also possesses distinct architectural features, influenced by the choice of building materials, carpentry techniques, and architectural styles.

The Ihsaniah Iskandariah Mosque is one such mosque with a historical past that may not be widely known. Although it is no longer in regular use, the mosque remains an architectural gem. Its heritage continues to attract visitors, drawn by its distinctive architectural style, which sets it apart from typical mosques in the surrounding area and throughout Malaysia.

Located in Kampung Kuala Dal, Perak, the Ihsaniah Iskandariah Mosque represents a unique fusion of traditional Malay craftsmanship and Islamic architectural influences. Built in 1936, it was commissioned by Sultan Idris Murshidul'adzam Shah, the 28th Sultan of Perak (Harun et al., 2008), to honor his father, Sultan Iskandar Shah, and his son, Sultan Iskandar Shah II, highlighting its deep royal connections.



Figure 1 Inauguration plaque inscribed with the date of the inauguration of Kampung Kuala Dal Old Mosque. (Source: Official Portal of the National Heritage Department)



Figure 2. The inauguration ceremony of the mosque which was completed by His Majesty Sultan Iskandar Shah the 30th Sultan of Perak

The uniqueness of this mosque is evident in its construction design, which resembles a birdcage. According to Harian Metro (2016), the distinct feature of this two-story mosque is its entirely woven oil bamboo walls, known as dinding *tepas/tepus*, which create the illusion of a two-story structure despite having only one floor. The mosque also features 20 windows adorned with engravings of bean sprouts, crescent moons, and stars. Its walls are composed of two types of paneling: bamboo and wood. The upper level is fully constructed with bamboo panels, while the lower level incorporates both bamboo and wooden panels.

1.1 Problem Statement

Its distinctive bamboo panel walls (*dinding kelarai*) highlight the intricate artistry of local weavers, making it a rare and valuable heritage site. As Hunt (2012) describes, many cultural heritage sites feature wooden artifacts crafted by artisans, showcasing their artistic ability due to wood's availability and ease of use. Furthermore, wood is a renewable resource, as a new tree can be planted to replace one that has been cut down.

Although *kelarai* is a traditional and eco-friendly material for wall construction, it has several drawbacks under varying climatic conditions. Its deterioration is largely driven by the fact that traditional materials such as bamboo are vulnerable to environmental factors, including irregular rainfall and temperature fluctuations. Since parts of the mosque were damaged in 2008, the Department of National Heritage has made efforts to mitigate further deterioration. However, sections of the walls have continued to suffer significant damage over the years.

Currently, the mosque is used only for occasional religious events, with minimal community involvement. Its underutilization as a functional space limits its potential to foster cultural and educational engagement. Without consistent programs, such as workshops or heritage events, the mosque misses opportunities to connect with both locals and visitors. Its unique architecture and historical significance could attract tourists, yet it remains largely inactive, diminishing its role as a vibrant community hub. This inactivity risks weakening the community's connection to the mosque, reducing both pride and participation in its preservation. Expanding activities and improving accessibility could transform it into a lively, multifunctional space for all.

LITERATURE REVIEW

2.1 History of Ihsaniah Iskandariah Mosque

The Ihsaniah Iskandariah Mosque, located in Kampung Kuala Dal, Padang Rengas, is about 4.8 kilometers from the Royal City of Kuala Kangsar and only 2 kilometers from the PLUS Toll Plaza leading into Kuala Kangsar. Constructed primarily of wood, the mosque is situated on the left side of the road from Kuala Kangsar to Taiping and is easily recognizable.

The Ihsaniah Iskandariah Mosque was built by Sultan Iskandar to fulfill a vow after one of his sons recovered from an illness (*Majlis Perbandaran Kuala Kangsar*, 2022). Kampung Kuala Dal was chosen as the mosque's location because His Majesty, along with dignitaries and the royal

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family, often picnicked at Lata Bubu, a royal retreat near the village. During his visits, he frequently saw villagers praying in a dilapidated *madrasah*. Moved by compassion for the local residents, he commissioned the construction of the mosque, naming it Ihsaniah Iskandariah in his honor.

According to Harun et al. (2008), based on previous narrations, the mosque was built using courtesy funds from Sultan Iskandar Shah at a cost of approximately RM8,000.00. It was constructed on a plot of land verbally endowed by a nobleman, Juragan Abdul Shukur Bin Mohammad Ali. The construction was led by Chinese craftsmen, while the weaving of the walls was carried out by several local artisans, including Panjang Noh, Ngah Gadoh, Wan Ibrahim, and Kulop Ngah.

2.2 Current Usage of Ihsanian Iskandariah Mosque

The Ihsaniah Iskandariah Mosque ceased regular use in 1976 after the construction of a new mosque, Masjid Al-Wahidiah (Department of National Heritage, 2024). Masjid Al-Wahidiah was built on the same site to address the spatial limitations of the original mosque. With the establishment of the new mosque, Ihsaniah Iskandariah Mosque is now used only on special occasions, particularly during holidays and festive celebrations. The condition of the mosque after it was vacated in 1976 is shown in Figure 3. Over time, its function has gradually declined, and it remains in a state of disrepair with no specific activities being carried out. Today, the mosque primarily attracts the attention of researchers interested in architecture, wood carvings, and *kelarai* weaving.



Figure 3 : The condition of the mosque after it was emptied in 1976. (Source: Official Portal of the National Heritage Department)

However, the National Heritage Department initiated conservation efforts to revitalize the mosque in 2008, as shown in Figure 4 Despite these extensive efforts, the mosque's bamboo panels and other structural elements continue to deteriorate, threatening its historical integrity.

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To preserve the original materials, the walls were reconstructed using the same materials bamboo and wood. For the bamboo panel walls, the weaving designs and patterns remained faithful to the original, ensuring authenticity. Additionally, the width and thickness of the bamboo strips were replicated to match the originals. The shape and arrangement of the weaving patterns were carefully positioned according to the original layout, with each bamboo panel wall precisely measured for accuracy.



Figure 4 : After conservation work in the year 2009. (Department of National Heritage, 2024)

2.3 Material of Ihsanian Iskandariah Mosque

The Malay community has long utilized weaving and *kelarai* techniques to produce various everyday items, such as *mengkuang* mats, *rombong,* baskets, and walls (Ahmad Zakaria et al., 2018). Among the traditional wall decoration techniques used are weaving and carving. *Kelarai*, as shown in Figure 5, is a weaving technique that was historically used to decorate the walls of palaces and Malay houses. In some regions, *kelarai* refers specifically to woven bamboo used as walls or partitions within houses, while in other areas, this type of weaving is made from a material known as tepas. The creation of *kelarai* or tepas results in a structure that is strong, rigid, and coarse, making it suitable for use as a space divider. Mohd Aripin and Muhammad (2017) stated that the *kelarai* weaving technique serves not only as a decorative element but also enhances ventilation within a space. However, changes in modern building structures have rendered these traditional wall decoration techniques less suitable for contemporary use. As a result, modern buildings have adopted alternative methods for wall decoration.

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Figure 5 : Example of Kelarai (Source Ismail et. al., 2023)

Unfortunately, bamboo is an organic material and, therefore, prone to decay. Due to the harsh climate and heavy rainfall, these organic materials have not been able to withstand the test of time. The mosque's bamboo panel walls, built nearly 15 years ago, have now deteriorated and require replacement. Figure 6 shows the current condition of the *kelarai* walls of Ihsaniah Iskandariah Mosque.



Figure 6 : Current condition of the *kelarai* walls of Ihsaniah Iskandariah Mosque, Padang Rengas. (Source: Syed Abdul Haris et. al., 2024)

2.1 Role of Heritage Buildings in Community Identity

Heritage buildings like the Ihsaniah Iskandariah Mosque are vital for preserving cultural identity and fostering community pride. They serve as tangible connections to the past and provide local residents with a sense of belonging. Engaging communities in the preservation and utilization of such sites strengthens their relevance and ensures intergenerational appreciation (Ahmad Zakaria et al., 2018).

Currently, the mosque is not fully serving its intended purpose as a community hub; it functions primarily as a venue for prayers and small events during Eid and Ramadan. It is

evident that the community does not actively use the mosque throughout the year. As a result, a significant opportunity is being overlooked—one that could transform the mosque into a multipurpose space for education, culture, and tourism.

Due to the lack of regular events and dedicated staff, the mosque has not been able to develop into an educational center for multicultural activities. For instance, it could offer courses on Malaysian architecture, Islamic art, or traditional bamboo weaving, actively engaging locals in learning and reconnecting with their cultural heritage. Additionally, courses on Islamic history or Malay architecture could provide valuable insights for students.

Furthermore, the mosque's inactivity limits its appeal to tourists and individuals interested in its architectural and historical significance. If such important sites are not actively utilized and engaged with, they risk becoming mere artifacts rather than living heritage. *Harian Metro* (2016) highlights the need for new strategies to revitalize the mosque. The inclusion of diverse activities and improved accessibility could facilitate its transformation into a dynamic, multipurpose space that serves both the community and tourists, ensuring its relevance for generations to come.

2.3 Challenges in Revitalization

The bamboo panels of the mosque, while central to its identity and architectural appeal, are particularly vulnerable to environmental factors and pest damage. Continuous exposure to rain and humid conditions accelerates their deterioration, while termites pose a significant threat to their structural integrity. These signature features are costly to repair, as they require restoration by artisans skilled in the traditional art of weaving, which incurs substantial expenses for both materials and labor. This makes it challenging to maintain the durability of the panels while ensuring their authenticity remains uncompromised. Without proper treatment and regular maintenance, termites can severely weaken the *kelarai* walls (Afzanizam Muhammad et al., 2012). Restoring these panels demands specialized craftsmanship and significant financial resources. More importantly, preserving the authenticity of the panels while enhancing their durability presents a considerable challenge. To address these issues and extend the lifespan of the *kelarai* wall panels, the implementation of effective maintenance and conservation strategies is essential (Bredenoord, 2024).

Modernizing the mosque to tackle these challenges adds another layer of complexity. Incorporating contemporary materials or techniques to improve structural longevity risks compromising its historical integrity, potentially altering the very elements that make the mosque culturally significant. Conversely, adhering strictly to traditional restoration methods often limits the building’s adaptability for modern uses, such as serving as a multifunctional space for community and educational activities. Striking a balance between preservation and functionality is crucial to ensuring the mosque remains both a protected heritage site and a valuable community asset. As suggested by Syed Abdul Haris et al. (2024), while *kelarai* panels are more affordable and hold cultural significance, they require frequent maintenance, especially in humid and termite-prone climates. Therefore, they propose that fiber wall

panels, although more expensive, offer superior durability compared to *kelarai* panels. However, fiber panels may lack the natural aesthetic appeal and cultural authenticity of traditional *kelarai*.

Compounding these challenges is the limited involvement of the local community in the mosque's conservation and use. The disconnect between residents and this heritage site weakens the sense of collective ownership and responsibility. This is particularly evident among the youth, who may not fully understand the mosque's historical and cultural significance. Their active participation is essential to ensuring the long-term presence of conservation efforts in the area. Encouraging community engagement and instilling a sense of pride and responsibility in the younger generation is crucial for preserving the mosque for future generations (Taufik Shahidi et al., 2022).

2.4 Strategies for Revitalization

When it comes to preserving the mosque's distinct characteristics and enhancing their longevity, the focus is on utilizing eco-friendly materials. Sustainable materials are essential for maintaining the mosque's iconic features while improving their durability. Additionally, innovative techniques such as thermochemical compression densification can significantly extend the lifespan of the panels. This method not only strengthens the material but also reduces its susceptibility to decay over time, thereby safeguarding the mosque's structural integrity (Ismail et al., 2023).

Community engagement through educational outreach can foster stronger connections between the local community and the mosque. Cultural workshops, such as bamboo weaving classes, can help revive pride in local traditions and craftsmanship. Moreover, organizing heritage events including tours, exhibitions, and religious gatherings can attract diverse audiences and raise awareness of the mosque's historical significance. These activities encourage shared experiences and cultivate a deeper appreciation for the heritage site and its role within the community.

Integrating the mosque's history into educational programs can help instill a sense of awareness and responsibility in students. Collaborations with schools and universities can transform the mosque into a valuable learning resource, offering insights into its architectural and cultural importance. Storytelling sessions and lectures can further enrich participants' understanding of the mosque's historical role and the significance of conservation efforts.

Digital tools provide a powerful platform for increasing the mosque's visibility and accessibility. Virtual tours and mobile applications can allow global audiences to explore its unique features remotely. Additionally, social media campaigns can play a crucial role in promoting the mosque as both a cultural landmark and a tourist destination, drawing attention to ongoing conservation efforts and engaging a wider audience.

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CONCLUSION

Revitalizing the Ihsaniah Iskandariah Mosque presents a unique opportunity to preserve an important cultural landmark while fostering economic growth and strengthening community bonds. The preservation process will focus on safeguarding the mosque's distinctive architectural features, particularly its bamboo panels, using appropriate methods to maintain the structure's integrity. By utilizing suitable materials and modern conservation technologies, the mosque can withstand environmental challenges, ensuring its cultural and historical significance is preserved for future generations. This meticulous effort will maintain the mosque's authenticity, allowing it to remain a rich reflection of the nation's architectural heritage.

From an economic perspective, revitalization can play a key role in boosting local tourism and generating business opportunities. Transforming the mosque into a cultural and educational destination will attract visitors, increase foot traffic, and create avenues for local artisans and small businesses to thrive. Activities such as weaving workshops, educational programs, and guided tours will not only enrich the visitor experience but also provide direct economic benefits to the local community. This integration of cultural preservation with economic development offers a sustainable model in which heritage and modern needs coexist harmoniously.

Additionally, revitalization will foster deeper community engagement and pride, particularly among younger generations. Involving local residents through cultural programs, educational initiatives, and social media campaigns will cultivate a sense of ownership and ensure the mosque remains an integral part of the community. Encouraging youth participation will strengthen their connection to cultural heritage, creating a sustainable model for preserving the mosque's legacy. These efforts will help transform the mosque into a hub for learning, cultural exchange, and social interaction for years to come.

Achieving this objective requires multi-stakeholder participation, including collaboration between the public, local government, and preservation experts. Balancing contemporary conservation techniques with the principles of heritage stewardship will be challenging but essential. Leveraging modern technology, such as social media and virtual tours, can enhance the mosque's visibility, making it a prominent heritage destination. With a well-executed revitalization plan, the mosque's architectural and cultural significance as well as its role as a community center and a crucial symbol of Malaysia's national identity will be successfully preserved.

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REFERENCES

Afzanizam Muhammad, Anuar Talib, Mohd Sabrizaa Abdul Rashid, Abdul Hamid Mohamed and Noor Faiza Rasol (2012). The Study Of Traditional Malay Decorations & Wood Carving: A Case Study Of The Istana Kenangan, Kuala Kangsar, Perak. *The 9th Regional Symposium of The Malay Archipelago 2012 (*SIMPOSIUM NUSANTARA 9), 11-12 December. Perak,

Ahmad Zakaria, R. M., Abdul Wahab, M. R., Abdul Samad, M. A. & Mat Yacob, S. N.(2018). Analisis Simetri Rekaan Corak Kelarai Anyaman Tikar Di Alam Melayu. *Jurnal Arkeologi Malaysia*, 31(1), 19-26.

Arif Sarwo Wibowo (2015). Conservation of Wooden Architecture: Willingness, Support and Tradition. *Procedia - Social and Behavioral Sciences* 184 (2015) 388 – 393.

Bredenoord, J. (2024). Bamboo as a Sustainable Building Material for Innovative, Low-Cost Housing *Construction. Sustainability*. 16 (2347).

Department of National Heritage (2024) Website https://www.heritage.gov.my/my/

Harian Metro (2016) Tepas Buluh Penyeri Masjid. Artikel disiarkan pada 30 Januari 2016.

Harun, S.N., Nordin, T. E., Hasbullah, M.N. & Zainonabidin, A. (2008). Pengurusan Pra Kontrak Projek Pemuliharaan Masjid Ehsaniah Iskandariah, Kg Kuala Dal, Kuala Kangsar, Perak Darul Ridzuan: Tinjauan Perbezaan dengan Projek Pembinaan Baru. *Seminar Penyelidikan Siswazah Alam Bina*, 4 Disember 2008. UiTM Perak.

Hunt, D. (2012). Properties of wood in the conservation of historical wooden artifacts. *Journal of Cultural Heritage* 13S (2012) S10–S15

Mohd Aripin, N. A. N. & Muhammad N. A. (2017), Seni Kelarai dan Seni Mural: *Pertembungan Timur dan Barat. Ideology Journal,* 2(2), 116-121.

Samadi, Z., & Mohd Yunus, R (2012). Urban heritage streets' revitalizing attributes. *Asian Journal of Environmental Behaviour Studies*, 3(7), 69-78

Shahrul Yani Said, Zulkiflee Abdul Latif and Lilis Sheerena Safree. (2016). Evaluating Physical Changes for the Conservation Initiatives in the Historic City of Melaka. *Procedia - Social and Behavioral Sciences* 222 (2016) 890 – 896

Syed Abdul Haris Syed Mustapa, Wan Faida Wan Mohd Azmi, Lilawati Ab Wahab, Mohd Nurfaisal Baharuddin and Muhammad Suhaimi Musa (2024). Exploring Alternative Materials for Bamboo Panel Walls in the Conservation of Ihsaniah Iskandariah Mosque : A Concept Paper. Malaysian *Journal of Sustainable Environment*. 11(3): Special Issue, Dec 2024

MAIN AUTHORS' PROFILE

	Associate Professor Dr. Mohamad Sabrizaa Abdul Rashid is a distinguished academic at Universiti Teknologi MARA (UiTM) in Perak, Malaysia, specializing in architectural design, heritage conservation, and sustainable urban development. He has contributed significantly to research on architectural heritage and community engagement, emphasizing the integration of local culture and sustainability in architecture. As the director of the Centre for Knowledge and Understanding of Tropical Architecture and Interior (KUTAI), he leads initiatives in tropical architecture studies, research, and various notable publications. Dr. Sabrizaa is also active in academic conferences, sharing his insights with peers and students globally.
	Dr. Kartina Alauddin is an Associate Professor in the Quantity Surveying Program at Universiti Teknologi MARA, Perak Branch, Malaysia. She earned her PhD in Built Environment from the Royal Melbourne Institute of Technology (RMIT), Melbourne, Australia. Her research focuses on intellectual capital for the adaptive reuse of historical buildings, and she has made significant contributions to the field through her publications in peer-reviewed journals, conference papers, and book chapters. Additionally, she is a researcher for the Knowledge and Understanding of Tropical Architectural and Interior (KUTAI) research interest group. With over 26 years of teaching experience at both undergraduate and graduate levels, Dr. Kartina has instructed a variety of courses in quantity surveying and project management. Her dedication to research excellence, teaching, and student mentorship underscores her invaluable role in the academic community.
	Mohd Azri Mohd Jain Noordin earned his Diploma in Interior Design in 2010 from Universiti Teknologi MARA (UiTM), Seri Iskandar Branch, followed by a BSc (Hons) in 2012 and an MSc in 2017 from UiTM, Shah Alam Branch, and Universiti Sains Malaysia (USM), respectively. He is currently pursuing his PhD at USM and has been a young lecturer in the Department of Interior Architecture at Universiti Malaysia Kelantan (UMK) for six years. Since 2018, he has focused on Interior Design, the Built Environment, and the intersection of Design and Culture, serving as Program Coordinator and Head of Program. His notable contributions to research and innovation include two Best Presenter Awards at conferences and several innovation awards at research carnivals from 2020 to the present.
	Associates Professor Sr Dr. Yuhainis Abdul Talib is an Associates Professor at the Department of Quantity Surveying, Department of Built Environment Studies and Technology, College of Built Environment, Universiti Teknologi MARA (UiTM Perak). She has served UiTM for 23 years. Her higher education background started with a Degree in Quantity Surveying from The Robert Gordon University, United Kingdom in 1997. In 2005, she received Master in Project Management from Universiti Sains Malaysia. She was awarded a Doctor of Philosophy (PhD) in Architecture (Facilities Management) from Deakin University, Australia in 2013. She has a a professional membership from The Royal Institute of Surveyor Malaysia (RISM) and Board of Quantity Surveying (BQSM) since 2017. She has been active in three research grants FRGS She is involved in both undergraduate and postgraduate teaching and supervision research. She has graduates 5 postgraduates students.

	Andi Yusdy Dwiasta is a senior lecturer in Architecture Study Program. He finished bachelor program in Gadja Mada University, and continued master's degree in Institute technology of Bandung. He interests research about Architecture and technology, urban design, and public space.
	Andi Abidah Finished Undergraduate of Architecture program in Hasanuddin University 1998, Master degree of Urban Design in Institute Technology of Bandung 2005, And Doctorate degree finished jn TU Wien. Her Research interes about Architecture culture of Asia, tradisional settlement or city.
	Associate Professor Sr Dr Haryati bt Mohd Isa holds a PhD in The Specialisms of Built Environment from Universiti Teknologi MARA (UiTM). Dr. Haryati is a Full-Time Associate Professor with UiTM and a Professional Quantity Surveyor registered with the Board of Quantity Surveyor Malaysia (BQSM). She is also member of Royal Institution of Surveyors, Malaysia (RISM). She is an active researcher, securing grants for projects focusing on defect liability management and cultural architecture documentation. As a recognized expert, she has been invited as a guest speaker at various institutions and conferences, sharing her knowledge on research writing, defects management and public-private partnerships. Dr. Haryati has also held several administrative positions within UiTM Perak, including Head of Centre for Postgraduate Studies and coordinator roles for various academic programs
	Nordin Misnat is a senior lecturer of Interior Design Technology Programme in UiTM Perak Branch. PhD student in Architecture Department of Built Environment and Engineering Faculty, Universiti Kebangsaan Malaysia (UKM) after obtained his MSc in Facility Management in 2006 from University Teknologi MARA (UiTM), Shah Alam, Malaysia. He has experienced working with interior design firm with interior design professional qualification in commercial design, corporate office, residential and hospital design before started lecturing in UiTM Perak Branch for almost 17 years. He has had a distinguished career in teaching and learning, participating multi-disciplinary research and community projects.

	Zamil has been a lecturer for over 15 years at the Universiti Teknologi MARA Perak Branch. He is a qualified Professional Landscape Architect registered with the Institute of Landscape Architects of Malaysia (ILAM). Zamil is also a researcher at the Center of Knowledge and Understanding of Tropical Architecture and Interior (KUTAI) at UiTM Perak Branch. His research interests include cultural landscapes, Malay gardens, Malaysian gardens, and tourism development. He has received funding for his studies from various government bodies, including MOSTI (eScience fund) and MOHE (FRGS). Additionally, he has contributed to over 50 scientific articles in his field of specialization. His recent study is titled "Malaysian Garden Concept" design guidelines and criteria. Furthermore, he serves as the Deputy Chairman of the ILAM Northern Chapter for the 2024-2026 session
	Nurrajwani Binti Abdul Halim brings over 21 years of experience as a senior academic in the Department of Interior Design Technology at the College of Built Environment, Universiti Teknologi MARA (UiTM), Perak Branch, located in Seri Iskandar, Perak, Malaysia. Her expertise spans Interior Finishes and Materials, Building Construction, Consumer Behaviour, Interior Landscaping, among other areas. Through her research, she aims to contribute meaningfully to the academic body of knowledge and provide valuable insights for the researchers, students, professional bodies, professional construction members including manufacturers, interior designers, architects, suppliers, and other industry professionals in assisting them in to promote sustainable living environments
	Marisa Hajrina, S.T., M.T., a lecturer with an architectural and urban background, currently teaches at the Architecture Study Program, Faculty of Engineering, Almuslim University. He obtained his Bachelor of Engineering degree in Architectural Engineering at Maulana Malik Ibrahim State Islamic University Malang in 2011 and continued his Masters studies at the University of North Sumatra, obtaining a Master of Engineering degree in the Architectural Engineering study program with a specialization in Urban Development Management in 2018.
	Moh Sutrisno received a Doctorate 2020 in Architectural Engineering and Planning at Gadjah Mada University. Previously he also earned a master's degree at the same campus in 2014 with cum laude predicate. He has taught architectural theory and criticism at UIN Alauddin Makassar since 2019 and has been the main subject in his functional position since being an expert assistant. The courses included the scientific fields of history and architectural theory. His research includes the theory of iconic architecture since 2012. He studied iconic buildings in various parts of the world, heritage architecture as an icon of its time in the old city space of Palopo (2015-2020), Icons of Islamic architecture in South Sulawesi (2020-2022), Currently, he is interested in Heritage building preservation methods using HBIM (2022-2023).

	Muhamad Ferdhaus is a senior lecturer in the Urban and Regional Planning Department at the UiTM Perak Branch. He graduated with a Ph.D. in Urban Geography in 2018 from the Universiti Sains Malaysia (USM), after obtaining his MSc in Sustainable City and Community in 2013 from the Universiti Sains Malaysia (USM). He received a bachelor's degree in urban and regional planning from the International Islamic University Malaysia (IIUM) in 2011. His field(s) of interest focus on sustainable cities and communities, Islamic planning and development, urban geography and metropolitan areas, tourism planning and development, and heritage and conservation
	Othman Bin Mohd Nor is a senior lecturer in the Interior Architecture Department at the UiTM Perak Branch. He graduated with a Ph.D. in Architecture in 2018 from the Universiti Teknologi Malaysia (UTM), after obtaining his MSc in Design in 2013 from the Institut Teknologi Bandung (ITB). He received a bachelor's degree in Interior Architecture from the Universiti Teknologi Mara (UiTM) in 2000 and a Diploma in Interior Design (ITM) in 2006. His field(s) of interest focus on Interior Design, Interior Architecture, Identity Architecture, Traditional, heritage, and conservation
	Ir. Zuraihan, S.T., M.T., a lecturer with a background in architecture and environment, is currently teaching in the Architecture Study Program, Faculty of Engineering, Almuslim University. He obtained his Bachelor's degree in Architecture from Syiah Kuala University in 2006 and continued his Master's studies at the same university, earning a Master's Degree in Engineering with a specialization in Environmental Technology and Management in 2012
	Afzanizam bin Muhammad received his Diploma in Interior Design in 1999 from Institut Teknologi MARA, followed by a BSc (Hons) in Furniture Technology in 2001 and an MSc in Heritage and Conservation Management in 2009, both from Universiti Teknologi MARA, Shah Alam Branch. Over the past 15 years, he has served as a lecturer at Universiti Teknologi MARA, Perak Branch. In 2017, he was appointed Assistant Conservator for heritage building conservation projects in Kuala Kangsar, Perak, an opportunity he used as the basis for his PhD research. He earned his PhD in Design and Built Environment in 2022 from the Faculty of Architecture, Planning, and Surveying, Universiti Teknologi MARA, Perak Branch. Since 2009, Afzanizam has been dedicated to academia, specializing in heritage conservation, particularly in timber buildings. His contributions to research are significant, and in 2018, he received the 'Best Research Paper Award' at the Third International Conference on Rebuilding Place (ICRP). Starting in 2024, he is officially accredited as a Conservator by the Malaysia Heritage Department

	Nur Huzeima Mohd Hussain is a senior lecturer in the Landscape Architecture Department at UiTM Perak Branch. She earned her PhD in Architecture from The University of Auckland, New Zealand, in 2015, following her MSc in Landscape Architecture from Universiti Sains Malaysia in 2004. Before joining academia, she gained professional experience in a landscape architecture firm and has since dedicated her 20th years of teaching in UiTM Perak. Her career spans teaching, multidisciplinary research, and community projects, with several secured FRGS research grants, university academic awards (AAU2019), published books, and postgraduate supervision. She has successfully graduated seven postgraduate students and is currently supervising five local and international students. Her research interests include Landscape Sociology, Sustainable Cultural Landscapes & Architecture, and Green Initiatives.
	Dr. Wan Faida Wan Mohd Azmi is a senior lecturer in the Quantity Surveying Department at Universiti Teknologi MARA (UiTM) Perak Branch, Seri Iskandar Campus. She earned her PhD in Quantity Surveying from Universiti Teknologi Malaysia in 2021. Her academic career spans teaching, research, and postgraduate supervision, with a focus on construction safety, design safety, and safety education. She has been actively involved in research projects, securing grants, and contributing to knowledge in her field. She is also involved in postgraduate supervision, guiding students in areas related to her research interests.



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