

A Theoretical Perspective on the Defensive Architecture of Melanau Tall Houses

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Abstract

This study offers a theoretical perspective on the Melanau tall house as a form of defensive architecture, examined through physical, environmental, and sociocultural dimensions of the typology using a grounded theory approach. The inquiry initially began as a general investigation of architectural characteristics, hence academic discourses linking the typology to defensive architecture gradually emerged. This shift was prompted by the recurring and consistent reference to defensive architecture throughout the analysis, despite its underdeveloped treatment in academic literature and its largely fragmented documentation within collective memory. Building upon the established physical and environmental dimensions, the analysis further examined how the identified defensive architectural characteristics evolved in response to shifting sociocultural dimensions of the Melanau society. This progression provided an opportunity to identify plausible indicators, within the lifespan of the typology, that best articulate its defensive imperatives across chronological and temporal transformations. Consequently, this perspective reaffirms the heritage resilience of the Melanau tall house, which is best understood through the adaptive continuity of sociocultural practices shaped by technological, environmental, and social change.

1.0 INTRODUCTION

Systematic archaeological excavations in Sarawak have been undertaken since 1945 (Harrison, 1970). While such efforts can greatly benefit from surviving material remains, this is not the case for many traditional dwellings. Although these structures are not considered ancient, they have largely disappeared due to the perishable nature of their construction materials, including timber, bamboo, and leaves. The absence of systematic documentation further complicates efforts to ascertain their architectural characteristics, rendering an investigation through a theoretical lens particularly timely and necessary. In recent years, there has been a modest growth in theoretical interest within the subject of Bornean vernacular architecture. For example, Zaini et al. (2018) examine the interpretations of the Bidayuh baruk in postmodern secular architecture, while Samat et al. (2024) investigate the transformation of traditional Sarawak Malay houses in terms of spatial layouts and socio-demographic changes. Zain, et al. (2021) further demonstrate how Dayak longhouse architecture in West Kalimantan is intertwined with indigenous cosmology and environmental adaptation.

While many studies focus on typologies that still exist, the Melanau tall house remains atypical within existing typological studies. In prevailing accounts of Melanau architecture, this extinct typology is recognised for its exceptional height, often reaching up to 40 feet, a defining feature in the collective memory of the Melanau community. However, the lack of surviving empirical examples and limited photographic records constrains further scholarly validation. An outstanding ‘preserved’ example is the full-scale replica of the Melanau tall house at the Sarawak Cultural Village (SCV) (see Figure 1), which has become a dominant reference. Arzmi (2024) offers a critique of such representations, arguing that such depictions of Bornean vernacular architecture in the form of replicas present a reductive narrative that traditional vernacular architecture has remained unchanged throughout history. This concern had also been previously voiced by Ting (2020) in his conclusion following his study on the hybrid-vernacular 1862 Bintulu-type colonial forts.



Figure 1. The Melanau tall house replica located at SCV (Source: Author, 2024).

There is considerable scope for discussion regarding the contrast between replicas and historically documented architectural variations. One clear example in the case of the Melanau tall house concerns its height, as colonial records describe these structures as reaching between 35 and 50 feet (Low, 1848; Mundy & St. John, as cited in Roth, 1896; Vigors, 1849). These descriptions are further supported by more recent scholars, including Morris (1991), Ting (2018), and Long & Chik (2020). Low (1848) notes that the dramatic elevation and thick posts of these structures afforded villagers sufficient time to repel attackers using dropped beams, stones, and small cannons, implying the markedly defensive nature of the architecture at that time. In contrast, the SCV replica stands at only 20 feet and incorporates a modern layout designed to accommodate tourism and contemporary functional requirements, as confirmed by both the architect and Melanau elders involved in the project.

Nevertheless, the defensive architecture narrative remains discernible in historical descriptions, oral traditions, and the replica itself. The defensive connotations attributed to this replica (Gapor et al., 2022; Bahauddin and Mustika, 2018; Bahauddin and Musadat, 2019), together with evidence from several historical documents, collectively contribute to the formation of a theoretical framework indicating that the Melanau tall house possesses characteristics of a defensive architecture. Accordingly, by adopting a grounded theory approach, the study relates key scenarios of Melanau experiences to the defensive architectural dimensions of the tall house to interpret a model of the Melanau tall house as a defensive architectural typology. Ultimately, the study aims to theorise the reciprocal relationship between Melanau-related dimensions and the emergence of defensive architectural characteristics in the tall house, with grounded theory as the principal methodological framework.

2.0 GROUNDED THEORY METHODOLOGY

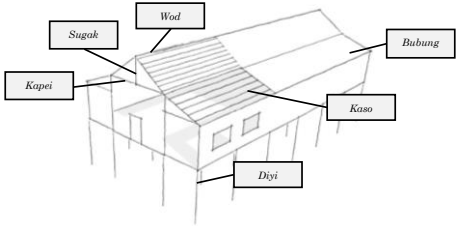
Grounded theory is particularly well-suited to identifying recurring patterns identifying recurring patterns, subtle variations, and historical trajectories of the Melanau community. The study began with open coding, which involved identifying and categorising phenomena across a diverse range of data sources (Corbin & Strauss, 2015). These sources included identifying the explicit or implicit concepts, such as architectural elements, space configurations, materials, structural dimensions, and the locations.

The primary method remains deliberately unstructured throughout, embracing a wide range of evidence including sketches, textual descriptions, replicas, and remnants, consistent with the exploratory orientation of grounded theory. Inspired by methodological advances in theoretical sampling, this approach aligns with the iterative cycle of data collection and analysis, where decisions about further data sources are guided by emerging findings (on the defensive architecture), rather than predetermined criteria. The key resource consisted primarily of interviews, due to its power in yielding underlying concepts. They were progressively accumulated through theoretical sampling and concluded with a total of 26 informants discovered in the areas and regions in Sarawak with notable Melanau physical and historical presence. A significant component of the dataset comprised historical sources from the colonial period. The research recognises that these sources, for all their descriptive value, are subject to the biases and personal interpretations of their foreign writers. Arzmi (2024) stresses that when studying from these sources it is important to disseminate the resultant information in a decolonized context. Therefore, by engaging with cultural experts and local informants, colonial-era information could be further elucidated with renewed local understanding.

The initial interview phase adopted an inductive approach, where specific concepts were explored to generate broader generalizations and uncover emerging patterns. This stage aimed to elicit key codes, such as the significance of the concept of 'height' in the tall house. The second interview phase adopted a deductive approach, refining the most salient findings to prepare for an abductive synthesis in the subsequent stage. For instance, this concept was examined in relation to historical phenomena such as conflicts, cultural exchanges, and other socio-political forces. This cycle engaged a diverse range of informants, including members of the public and professionals. Notably, some local informants, particularly those residing near ancestral sites or retaining vivid recollections of the tall house, were also consulted.

The study ultimately concentrated on three principal sites, namely Kampung Tellian (Mukah), Kampung Nangka (Sibu), and Kampung Tian (Matu). Here, selected local elders and residents, numbering six elders and four villagers, were central to the interview process. On the other level, key cultural custodians were identified. These included representatives from Melanau associations, professional storytellers at heritage attractions, and officers from cultural institutions such as the Sarawak Museum Department. These engagements naturally extended to include identification of studies detailing the Melanau people's interactions with adjacent and external communities. Additionally, field visits were conducted to Kampung Sok in Matu, where the best-preserved Melanau longhouse (a related variant of a tall house) was identified. These visits facilitated constant comparison of construction techniques, spatial organisation, and defensive strategies, particularly between the architectural variants of the tall house and longhouse baselines presented in Table 1.

Table 1. Primary physical baselines used throughout the study.

No.	Baselines	Descriptions
1.		An outline of the basic anatomy of the Melanau tall house in Mukah, as detailed by informants from the Federation of Melanau Associations and the Sarawak Council for Native Customs & Traditions. <i>(Note: The terms are from the Melanau Mukah dialect.)</i>
2.		The replica of the Kampung Nangka tall house (original structure burned down in 1937) at the Sibu Heritage Centre. Constructed in 1988 by the Sibu Civic Centre Cultural Heritage Committee (Image source: Author, 2023)
3.		The dismantling of <i>lebu' regau</i> (meaning “tall house” in the Melanau Matu dialect) in Kampung Tian, Matu, in 1980 (Image source: Matu informant, 2023).
4.		A surviving full-scale example of a Melanau longhouse variant in Kampung Sok, Matu constructed in 1872. (Image source: Author)
5.		Example of a visual information showing two still standing <i>belian</i> posts in Dalat (Photo courtesy of Mr. Leo, 2023) and Kg. Tian, Matu (Photo from field visit, 2023).

The third interview mode adopted an abductive approach, engaging related experts to validate emerging concepts. This included an architect involved in designing the Melanau tall house replica at SCV, cultural custodians from the Federation of Melanau Associations, and representatives from the Sarawak Council for Native Customs & Traditions. The inquiry was further extended to various public levels, including knowledgeable enthusiasts with deep insights into Melanau culture and history. These discussions reaffirmed connections between new concepts. For example, the connection between the house’s height and Melanau domestic and foreign interactions. Variations in the tall house’s height were interpreted across multiple conceptual codes, from which the most compelling relationships were prioritised for deeper exploration using other non-verbal sources. Complemented by axial coding, it established relationships between categories and explored causal linkages, such as between the houses’ height and historical correspondences. The final stage, selective coding, centred the theory within the paradigm of the defensive architectural modes, as illustrated in Figure 2.

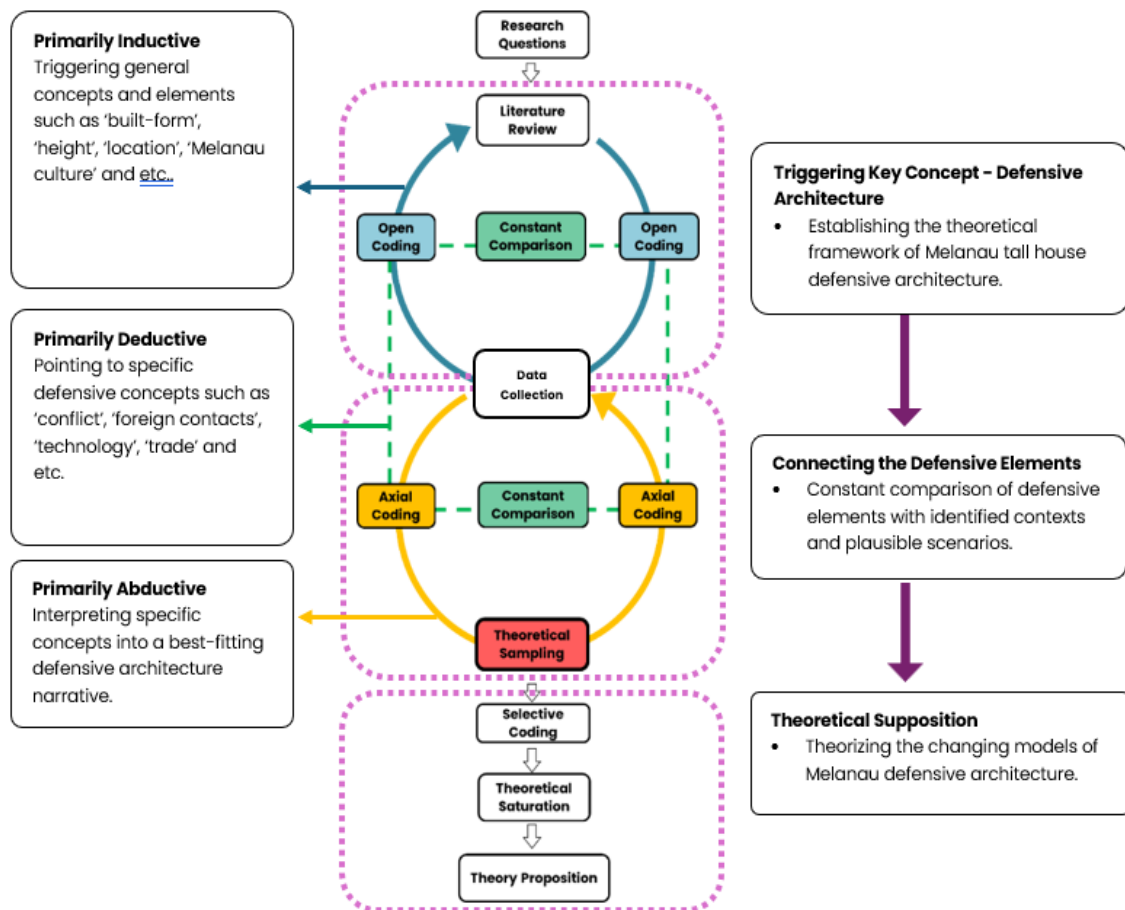


Figure 2. The methodological model for this study

3.0 TRIGGERING THE CONCEPT OF MELANAU DEFENSIVE ARCHITECTURE

This level of inquiry comprises a review of literature and audio-visual materials, followed by an analysis of interview transcripts and observations conducted during field visits in the Melanau region. Selected abridged examples are visualised in Table 2.

Table 2. Coding and preliminary 'memoing' of interviews throughout the study.

First-Order Code	Excerpt	Translation	Second-order Code	Memo
Fortification	"So dia akan buat tangga <bulat> macam ini, lebih kurang dua kaki, bila malam nanti diorang naikkan" -Ismail Dikoh, personal communication (2023)	"So, they will make a round ladder like this, about two feet wide, and at night they will pull it up."	Staircases	Notched log staircases that are retracted during the nights for protection.
	"Dan antara atap yang sebelah atas dan atap yang sebelah bawah yang saya terang tadi ada dua tahap ya nak? Di tengah-tengah ya ada satu ikatan yang dia panggil seketam. Fungsi ikatan tadi, pake ya nyilit musuh daripada jauh." -Mr. Ezzam, personal communication (2023)	"And between the upper roof and the lower roof that I explained earlier, there are two levels, right? In the middle, there is a binding called seketam. The function of that binding is to be used for observing enemies from a distance."	Roof Openings	Small openings between roof structures that assist in spotting and counterattacking against hostiles outside.

The first-order codes were guided by the overarching paradigm of the Melanau tall house as a form of defensive architecture (e.g., ‘fortification’), which guided the identification of excerpts containing implicit or explicit meanings related to this theme. The second-order codes were more explicit, derived directly from the informants’ statements and focused on descriptions of defensive elements mentioned in their testimonies. Through iterative coding, unified memos were consolidated into a structured list of defensive elements reported by the informants. These were further categorized by fortification type and tall house generation, reflecting their respective time periods and locales. A non-exhaustive summary of these categories is presented in Table 3.

Table 3. List of some defensive elements described to have been used in Melanau tall houses

Type	Element	Description	Context (Conjectural)
Structural Considerations	Retractable Stairs	The most described element among informants. Described as a notched ladder that would have been retracted up during the night or in case of attack. Also found in non-Melanau longhouses (and early forts), such as Iban Longhouses as recorded by Ting (2005, 2020).	All generations All regions
	Spiked Structural members	Some structural members (closest to entry points) were described as having rough edges grafted onto them, assumed by an informant to have been for a defensive purpose.	Late generation Early 1900s Kg. Tian
	Extra Structural Additions	Small additions, such as extra secondary beams under the main house body and protruding beams, provide a safe place to store boats and perches for livestock birds during prolonged floods.	Early generation Kg. Tellian
Layout Considerations	Building Height	Both literary sources and expert informants support the view that the height of these houses was primarily driven by defensive considerations, offering superior visibility and a physical advantage during potential attacks. Additionally, their considerable elevation served a practical purpose, protecting inhabitants and their belongings from flooding. Over time, the heights of tall houses started decreasing as the inconveniences outweighed any potential defensive benefit in increasingly peaceful environments.	All generations All regions
	Settled Location	Tall houses were said to have been initially located much further inland in the past as a means of concealment against riverine raiding parties. After the easing of hostilities over time, settling closer to the water became increasingly preferable.	Early generation Mukah
	Pillar Layout	During a period of larger tall house designs, additional structural members were used and described to have been arranged in such a labyrinthine way as to confuse attackers attempting to bring down the tall house.	Mid-generation Mukah
	Introverted Interior Spatial Design	The Melanau practiced a more introverted spatial design, with their primary communal spaces placed central to the plan, surrounded by the individual rooms that radiate outward according to a hierarchy.	All generations All regions
	Additional Pathways	Between the outermost wall and the perpendicular interior walls are small gaps, which were described to have been used during defence to travel along the outer edge of the house more effectively.	19 th century Matu-Daro

Component Use	Floors	The porous nature of the <i>rumbia</i> and <i>nipah</i> flooring was said to have been used defensively, with defenders pouring boiling water or jabbing spears onto invaders below. According to Mukah informant, the women would have rolled bamboo upon the floors when the men were out to mask the true number of inhabitants within the house, confusing attackers.	Late generation 1800s- early 1900s Kg. Tellian, Kg. Tian
	Walls	During more hostile periods in Kg. Tellian, the thatch walls were described to have been double layered in a lattice to provide better protection against blowpipe darts and other sharp projectiles, which were eventually countered using incendiary ranged projectiles instead.	Late generation 1800s Kg. Tellian
	Banded Thatch Sheets	The <i>nipah</i> roofing was described to have been arranged in sheets, each 5-6 feet in length, to mitigate the spread of fire. In the event of a roof fire, the burning sheet would have been cut loose, letting it fall off and preventing the further spread of flames along the other sheets.	Mid-generation Matu-Daro
	Fenestrations between Roof Layers	The Matu-Daro tall houses provided an example of gaps between two levels of roofing, which allowed their inhabitants better surveillance capability and functioned as firing ports for ranged weapons against attackers.	All Periods Matu-Daro
Material Choice	Ironwood	The <i>belian</i> “Ironwood” timber is well-known in Bornean cultures for its height, durability, and strength (Low, 1848), therefore was sought after to construct the primary structural posts of the Melanau tall house, with these same <i>belian</i> posts being the only remains of Melanau houses today, still present to some extent in Kg Tellian, Kg. Tian, Kg. Jemoreng and other Melanau villages state-wide, according to Mukah informant.	All generations All regions

From the inventory of defensive elements, some choices span multiple regions and locales, while others are retained throughout generations. It is also important to note that, aside from the features observed at the Kampung Sok Longhouse, informants did not typically refer to specific examples of individual tall houses. Instead, they described features of Melanau houses known to them through oral transmission or personal experience, such as the relatively more recent houses in Kg. Tian, Matu. As such, the grounded theory methodology required the study to ‘paint an image’ of these tall houses through saturation of descriptors in the data. This was achieved by drawing connections among relevant codes and weaving them into a coherent narrative framework.

4.0 CONNECTING THE DEFENSIVE ELEMENTS

Toscano (2022) notes that defensive architecture extends beyond the conventional understanding of fortresses, functioning not only as a security mechanism but also as an instrument that reshapes public space in accordance with political agendas of privatisation, exclusion, and control. When applied to the indigenous architecture of Borneo, this concept is reflected in architectural forms that evolved as pragmatic responses to inter-tribal conflict, headhunting practices, piracy, and wildlife threats. Drawing on the established spatial dimensions of Iban and Kenyah longhouses, Ting (2005) provides a foundational framework linking physical strategies (such as pile elevation and minimal perimeter exposure), environmental considerations (the use of low-thermal-mass local materials suited to a humid climate), and socio-cultural factors (political and spatial hierarchies reflecting social classes).

Following the axial coding stage, the analysis advanced to selective coding, which consolidated the identified defensive elements shaped by forces such as conflict, external influence, and cultural transmission.

These elements were refined into three principal selective codes corresponding to the physical, environmental, and sociocultural dimensions, which have emerged as central to the architectural inquiry. The discussion following Table 4 presents a condensed synthesis of the analysis, examining how tall house architecture evolved as a distinctive solution to the defensive imperatives of the Melanau people.

Table 4. The dimensions of Melanau tall house defensive architecture.

Selective Codes	Description	Notable Sources
Physical Dimension	• Height offered a tactical view to spot potential threats. • Raised structure proved useful during wars and river piracy. • Access via retractable ladders boosted defence against intruders. • Robust materials ensured resistance to damage.	• Roth (1896) • Low (1848) • Long & Chik (2020) • Ong, E. (personal communication, 2023) • Federation of Sarawak Melanau Associations (personal communication, 2023)
Environmental Dimension	• Raised structure reduced flooding risks in low coastal zones. • Height shielded against waterlogging and unstable ground. • Though timber was remote and hard to access, durability and height was prioritised.	• Alwi (2021) • Dikoh, I. (personal communication, 2023) • Sapan Puloh Museum (personal communication, 2023)
Socio-cultural Dimension	• Tall houses served as cultural hubs, housing extended families and nurturing kinship ties. • Functioned as centres for communal gatherings and collective activities. • Monumental design mirrored Melanau worldview. • Influences in relation to other groups. • Layout with spaces housed strategically based on hierarchy.	• MacDonald (1957) • Gapor et al. (2022) • Sibu Melanau Association (personal communication, 2023) • Sarawak Council for Native Customs & Traditions (personal communication, 2023)

4.1 Physical Defence Dimensions

4.1.1 Technicality and Technology

The technical and technological dimension indicates that the physical defensive architecture of the Melanau tall house was made possible through the community's technical and technological ability, dating back as early as the 10th century. Melanau architecture exemplifies technical skill through the construction of tall houses, utilizing readily available materials like belian timber (Low, 1848), which reflects a technical understanding of handling its exceptional durability, despite the difficulties in procuring such materials (Alwi, 2023). The transportation of belian timber, often requiring flotation by raft, reflects significant logistical difficulties further compounded by historical intergroup dynamics (Walker, 2002).

Historical interactions, particularly with Chinese traders from as early as the 7th century, likely influenced Melanau construction techniques through trade and technological exchanges. Nan-hai-chih (1304), a Chinese travel journal documenting interactions with Igan, indicates the likelihood of trade connections that may have facilitated the transmission of architectural technology. As maritime trade intensified, advanced carpentry skills and access to formal architectural knowledge became possible, contributing to the distinct craftsmanship observed in Melanau structures. For instance, the preservation of early Song Dynasty ceramics as family heirlooms suggests that initial contact may have occurred as early as the 10th century (Edric Ong, personal

communication, 2023). The presence of technically analogous construction practices in both 12th century Chinese and Melanau construction practices is also noticeable, suggesting possible technical and technological exchanges along the coastal regions, as illustrated in Figure 3.

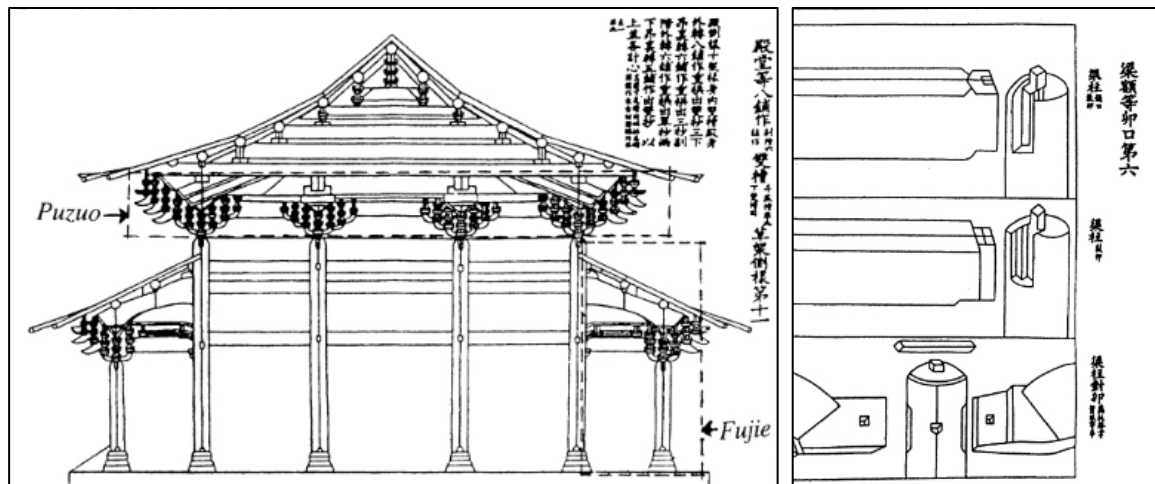


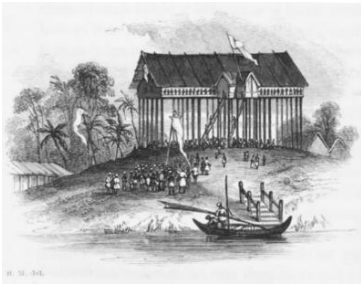
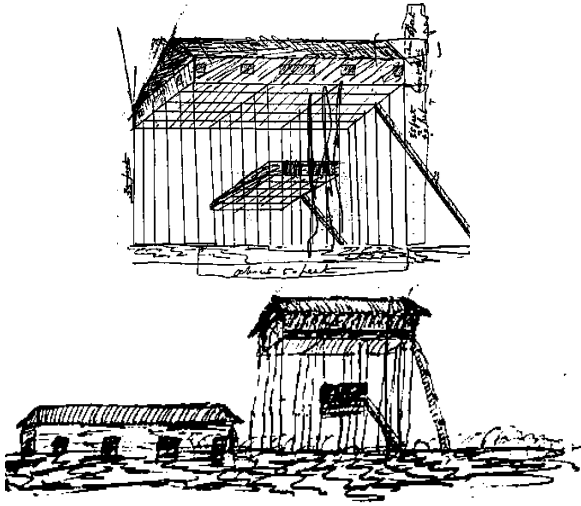
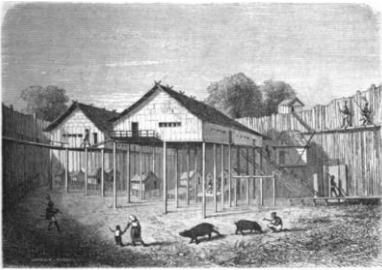
Figure 3. Illustration of the Chinese post-and-beam detailing techniques for working with hard timber, demonstrating a comparable detailing of the Melanau baselines. Source: Yingzao Fashi (1103, as cited in Guo, 1998).

4.1.2 Security

The Melanau defensive architectural tradition has likely been shaped by such crises dating back to the height of Melanau civilisation. Periods of crisis have frequently been associated with defensive innovations in architecture and preliminary interpretations suggest that the Melanau, who historically controlled river channels leading to seaports experienced frequent interactions, both amicable and hostile (Walker, 2002; 2017). Their strategic access to trade and supply routes would have facilitated the procurement of materials and the continuity of architectural practices. The elevated Melanau tall house was also a strategic response to threats, offering both surveillance and protection. Remote locations and the absence of direct paths served as deterrents against headhunting raids, reflecting the Melanau's historically ambivalent relations with various regional groups.

In riverine settlements, Melanau villages were sometimes encircled by tall palisades (made from less durable timber), especially during the wet season when coastal raids were frequent (Ting, 2018). Low (1848) recounts how attackers used overturned war boats as mobile shields to breach these palisades and target the house posts, with success depending on the thickness of the columns. Extending from these riparian conflicts, an examination of Borneo's river networks reveals numerous similar responses. The recurrence of such structures within defensive contexts suggests a shared architectural logic oriented toward fortification in the 19th-century Borneo, as presented in Table 5.

Table 5. Sightings of similar tall house occurrences in 19th century Borneo.

Visual Descriptions	Textual Descriptions	Sources
	Captain Rodney Mundy described a tall house belonged to Malay chief Patinggi Abdul Rahman near Sarikei as a "Dayak house", when the Rajang River was then a vital trade route.	Mundy (1848)
	Charles Grant, a close associate of James Brooke, drew a tall Malay house in Samarahan, raised over 35 feet, with a smaller attached structure used during the day or when pirate threats were low. Inhabited by Malays, but reportedly built by Dayaks.	Grant (1849); Grant (1866)
	Schwaner described Dayak settlements in Kapuas (Kota Bataguh), southern Kalimantan (now Indonesia), as fortified villages with houses surrounded by 30-foot-high <i>belian</i> palisades.	Schwaner (1862)
	A Kanowit village along the Rajang River, featuring a notably tall structure (approximately 50 feet). Drawn by Dr. Salter Livesay, who accompanied the expedition aboard HMS Albatross.	Vigors (1849)
	An illustration believed to be the same Kanowit village above, drawn in 1848 during HMS Phlegethon's visit. It offers a more proportionate and grounded portrayal, reinforcing the plausibility of such tall structures.	Mundy (1848)

In certain older Melanau traditions, spatial strategies were closely tied to defensive design principles. For example, historically enslaved individuals were housed in peripheral rooms to protect central occupants. Unlike the open-plan layout of Iban longhouses, Melanau architecture favoured inward-facing designs that emphasized communal security, with a central corridor, known as ‘*dar*’ or ‘*lalau jalan*,’ forming the spatial spine. Advanced elements such as hidden attics, concealed partitions, and top-hung windows (features derived from baseline defensive principles and reaffirmed by expert informants) reflect an active defensive approach. These elements exhibit clear similarities to those found in prefabricated, yet vernacular colonial Bintulu-type forts described by Ting (2020). Despite its fortress-like qualities, this defensive posture remained flexible, adapting to daily routines and shifting according to the presence of male occupants or the time of day.

4.2 Environmental Dimension

4.2.1 Context

Traditionally, the Melanaus lived in marginal areas such as coastal regions, which experienced rough seas for six months of the year, and in peatland areas that were swampy for nine months (Merawin, 1994). According to an informant, the Melanau people do not identify their dwellings as fortresses but rather as a type of normal residential dwelling, a concept within their worldview which emphasizes self-reliance in an insular and challenging lifestyle. This aligns with the idea of permanence and resilience, which have been the key to obtaining an understanding of local natural resources and constructing the strongest and formidable house using the most durable material.

Centuries ago, high-quality *belian* wood was said to be abundant in the interior regions, where much taller specimens were found. From a Mukah informant, the Melanau inhabited coastal regions and flood-prone areas, where seasonal flooding could reach heights of up to six feet. The Melanau houses would often feature elevated design, some with protrusions on the posts, known as ‘*pemaat*’, which were left uncut. These served as perches for chickens, providing them with a safe place to rest during floods (Federation of Melanau Associations, personal communication, 2023). The height of these posts necessarily exceeded six feet and likely extended to a maximum determined by available timber resources. Informants suggest that usable length of *belian* logs could plausibly have supported floor elevations of up to 35 metres above ground. This estimation aligns with the natural growth patterns of the *belian* tree (*Eusideroxylon zwageri*), which in the present day typically attains heights up to 50 meters in the lowland tropical rainforests of Borneo and other parts of Southeast Asia (Singapore National Parks Board, 2022).

According to an expert informant, high-quality *belian* wood, though scarce in coastal areas, is abundant along rivers like the Teloh River and was used in houses in Matu, including Kampung Sok longhouse. Timber sourced from Kampung Tegak was also reportedly employed in the construction of Bruneian palaces. Interactions with neighbouring groups facilitated the exchange of timber-treatment and sourcing techniques, supporting a river-dispersion model in which *belian* was transported from interior regions toward Melanau coastal settlements. Groups such as the Kayans and Kanowits, who shared comparable construction practices, likely played a role in assisting the Melanau in acquiring *belian* resources. As trade contributed to Melanau prosperity, power disparities widened and competition for strategically valuable territories intensified (Walker, 2002). Under these conditions, *belian* became an increasingly prized material, prompting the Melanau to develop their own methods of acquisition within the region. This shift reflects a broader trend toward self-sufficiency amid changing socio-political dynamics.

4.3 Socio-Cultural Defence Dimension

4.3.1 Melanau Fluidity

As coastal inhabitants, the Melanau were accustomed to navigating fluctuating alliances and persistent threats. For coastal areas formerly under Majapahit influence in the late 13th century, this context leads to the supposition that the early form of the Melanau tall house likely developed alongside the *a likou* belief system, which either evolved from, or later informed, Melanau polytheistic beliefs reflecting elements of Hindu cosmology (Awang Pawi, 2013). Comparable ritual practices, such as site purification, first-post placement, and spirit offerings, further emphasise these parallels.

By the 16th century, the Melanau had begun assimilating Bruneian cultural and political influences. This alliance was fluid, shaped by shifting geopolitical pressures and localised power dynamics (Haji Abdul Karim, 2016; Amir, 2015). An informant from Mukah describes the adoption of Brunei's administrative roles, such as the *temenggung* (known as *bunga bayau*), which introduced a Bruneian-style governance within Melanau villages. Leadership gradually shifted from traditional chiefs to *pengirans*, who oversaw multiple households. This integration deepened through intermarriage, with Bruneian nobles marrying into Melanau chieftain families, whose descendants remain in coastal communities (Aikman, 1958).

The Brunei cultural assimilations contributed to subtle architectural changes, coinciding with the decline of intertribal conflicts after the 19th century. Brunei's spatial hierarchy maintained social stratification, with elites occupying central zones while lower caste individuals were confined to the periphery. However, Malay-influenced spatial and physical features began to emerge, and subsequently, socially oriented spatial configurations became more dominant. The cultural adaptability of the Melanau promoted an architectural form that was diverse, ultimately leading to a sedentary typology by the late 19th century. Figure 4 presents a synthesized compilation of these snapshots of key Melanau socio-cultural experiences that likely reinforced their eventual architectural characteristics.

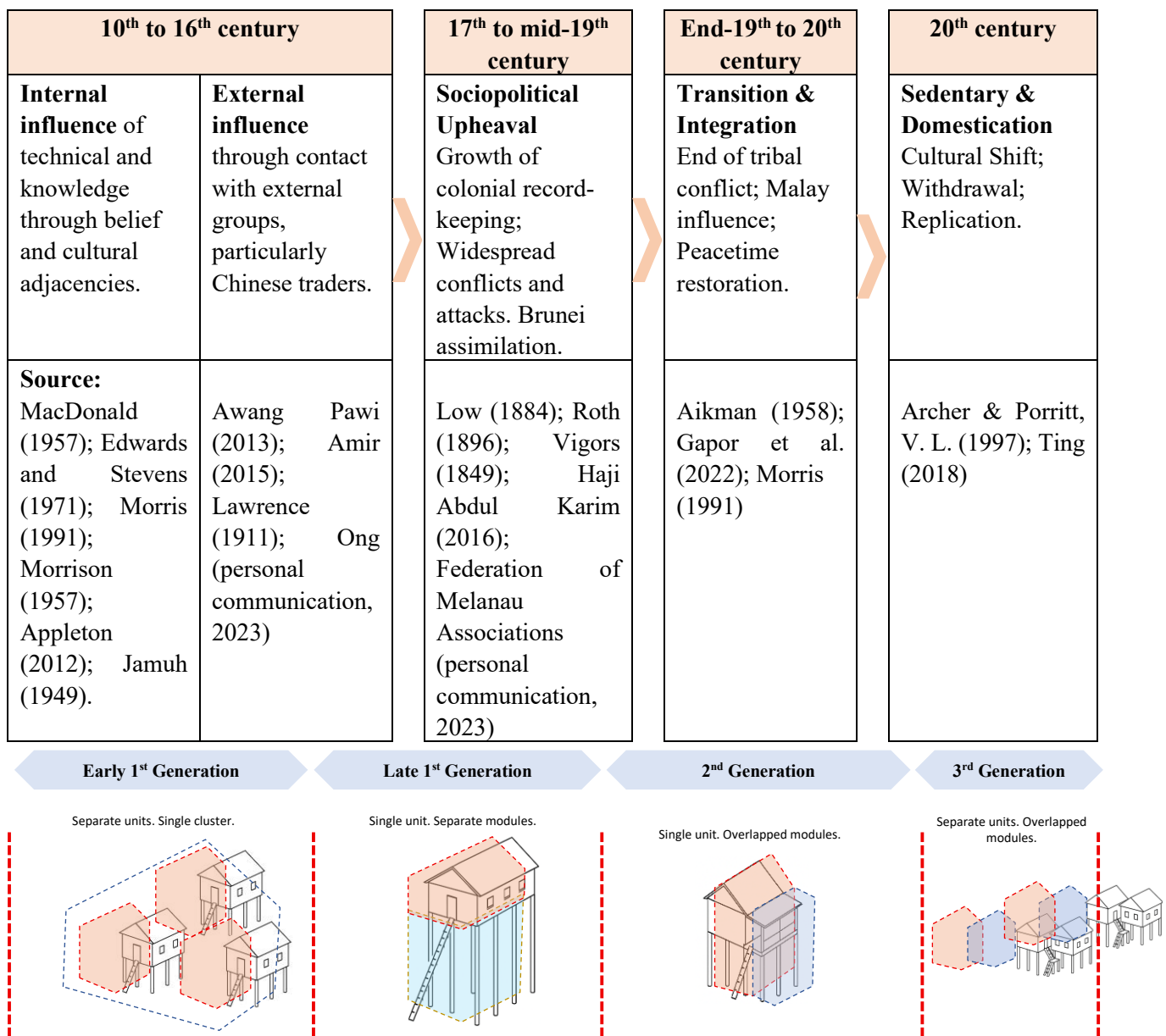


Figure 4. Timeline of the Melanau socio-cultural experiences corresponding to the tall house architectural schematics.

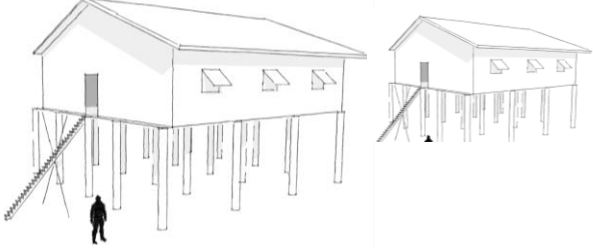
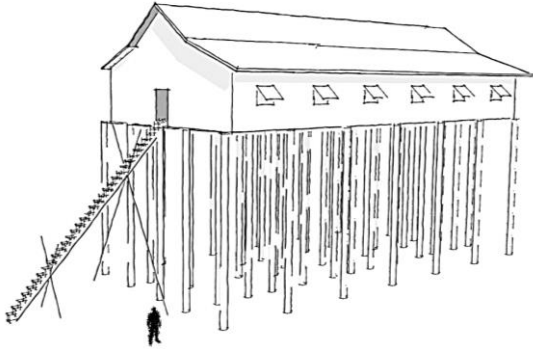
5.0 THEORETICAL SUPPOSITION

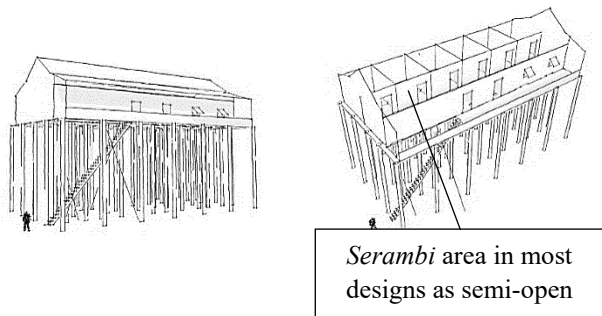
Situating architecture within a specific moment in time reflects the phenomenon of temporality, which may itself be examined as an independent inquiry altogether. However, positioning architecture along a spectrum of chronological trajectories offers a clearer analytical marker for understanding architectural development. As noted by Atabeyoğlu and Öztürk (2024), mapping architecture over time reveals the ways in which context shapes design. This study does not seek to identify the ‘origin’ or ‘demise’ of the Melanau tall house, it instead advances an architectural analysis that is best understood within a temporal continuum as architecture embodies lived temporal experience (Stefanovic, 1994). Accordingly, understanding this trajectory is key to interpreting the Melanau tall house as a manifestation of resilience rather than as a static object.

5.1 Chronological Modes of the Melanau Tall House Defensive Architecture

The defensive range of the Melanau tall house progressed from early internally integrated architectural strategies to peak defensive necessity, followed by a period of relative peace during the Brunei assimilation and Brooke administration in the 19th century. This suggests that the defining characteristics of Melanau tall house architecture were most pronounced in its late first-generation phase, corresponding to a period marked by intensified external influences and heightened sociopolitical upheavals between the 10th and mid-19th centuries.

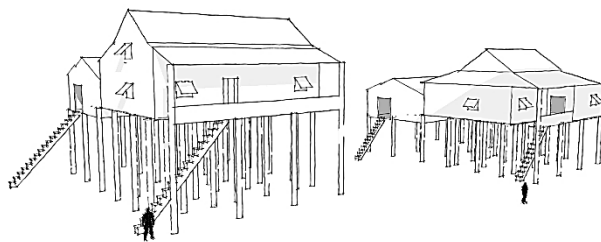
Table 6. The generational defensive modes of the Melanau tall houses.

Early first generation:	
	• Diverse materials with timber and jungle resources, driven by resourcefulness and early contacts. • Incorporated ritual practices and spatial restrictions. • Constructed with minimal height, addressing basic environmental concerns and offering little defensive capability. • Defensive strategy focused on strategic inland siting for concealment.
Late first generation:	
	• Hard timber frame construction with profiles influenced by Chinese techniques and Kayan–Kenyah interconnections. • Refined woodwork and technical sophistication, reflecting material abundance, tool mastery, and communal craftsmanship. • Achieved heights of 30–50 meters through perfected methods of timber acquisition and communal building practices. • Insular layout designed for maximum defense. • Most retained retractable ladders. • Some variations featured palisades.



Second Generation:

- Incorporated Brunei-Malay architectural traditions, including a prominent *serambi* space similar to the Dayak *ruai*.
- Designed for adaptability with potential horizontal extensions.
- Introduced semi-open spaces, balancing defensive needs with living functions.



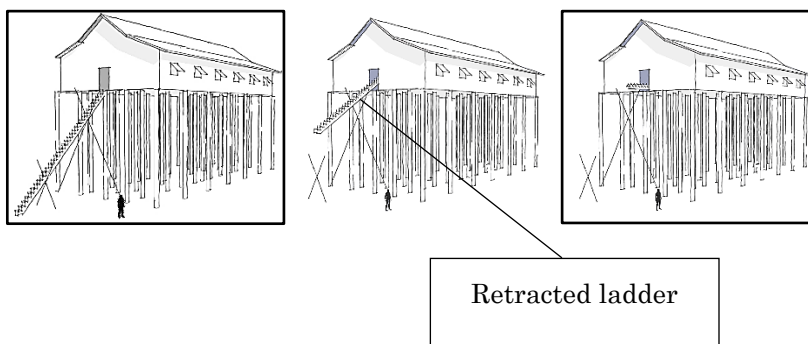
Third Generation:

- Introduced multiple access points for direct entry.
- Annexes and extensions became increasingly common.
- Adopted Malay architectural elements, including the *bumbung limas* roof form.
- Shifted toward shorter, standalone structures rather than elongated forms.
- Departed from earlier defensive designs, emphasizing domestic functionality.

5.2 Temporal Modes of the Melanau Tall House Defensive Architecture

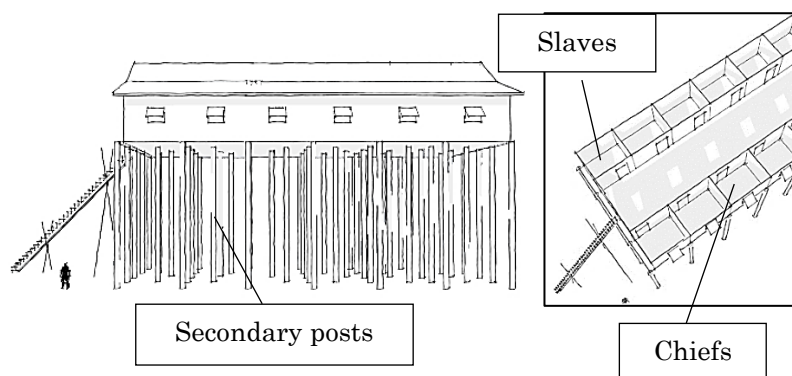
From this temporal perspective, activities such as sago processing, fishing, and farming were seamlessly integrated into spatial configurations that facilitated communal living while preserving strategic defensive separation. External amenities and detached workspaces emerged as pragmatic responses to environmental constraints and socio-cultural dynamics. For instance, strategic placement along river mouths combined with the use of water-resistant materials served to enhance both livelihood and defensive capacity. From a tactical standpoint, defensive strategies can be categorized into an active mode, which responds directly to threats, and a passive mode, which serves to delay, mislead, or sustain, as summarized in Table 7.

Table 7. The temporal defensive modes of Melanau tall houses.



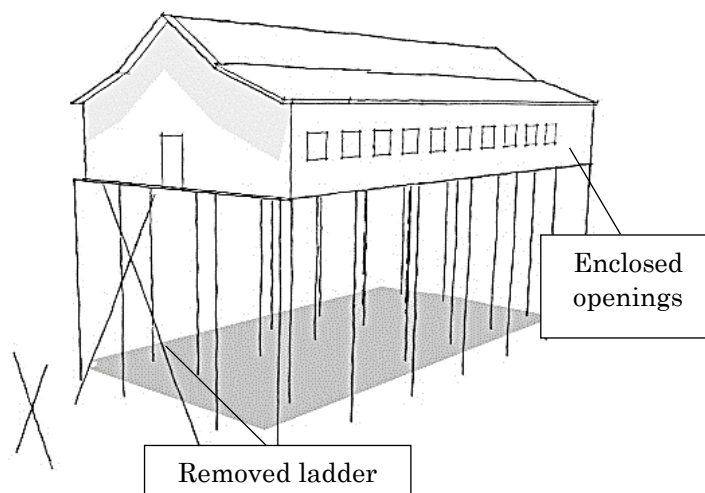
Active Mode

- Movable or retractable components were employed to limit access and avoid detection.
- The retracted ladder was kept within the *dar* space, protecting it from external tampering while remained accessible.
- Strategically placed floor openings allowed objects to be dropped on enemies.



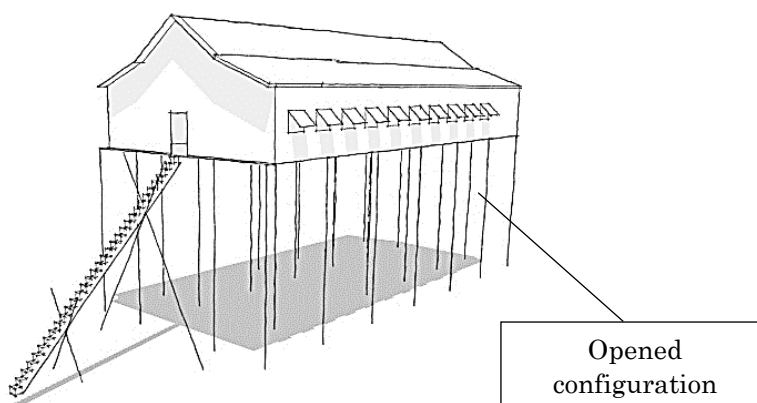
Passive Mode

- Tall structure providing elevated positioning.
- Additional posts are placed closely to confuse intruders.
- Introverted layout for communal interaction within an enclosed space.
- Hierarchical spatial organization, with the chief at the center and slaves at the periphery.



Full defence

- Fully enclosed to limit access and visibility, with minimal surveillance via concealed slit openings.
- Designed to blend seamlessly with the surrounding natural environment.
- Indoor activities predominantly occurred at night.



Semi-defence

- Open design to improve ventilation, allow surveillance, and maximize natural light.
- Moderate daily activities conducted with a sustained level of vigilance.
- Outdoor activities occurred during the daytime.

5.3 Defensive Architecture as A Manifestation of Resilience

Rather than being defined by the continued material survival of the Melanau tall house, resilience in this context is better understood through the adaptive continuity of socio-cultural practices shaped by technological, environmental, and social change. Across shifting ecological conditions, evolving construction knowledge, and prolonged socio-political negotiations, the Melanau demonstrated resilience not by rigidly preserving an increasingly impractical dwelling form, but by selectively retaining living heritage through belief systems, social organisation, rituals, and modes of everyday life while allowing the architecture itself to transform or ultimately be uninhabited. This trajectory echoes Chapagain's (2023) critical recontextualisation

of resilience in heritage discourse, which foregrounds intangible cultural continuity over the static conservation of physical monuments.

6.0 CONCLUSIONS

This study concludes that the late first generation of the Melanau tall house represents the apex of defensive architectural traits, correlating with periods of heightened upheaval and resulting in the longest persistence of a generational form. This endurance is further revealed through temporal modes that demonstrate how resilience was embedded within everyday life while discreetly incorporating defensive strategies. Despite subsequent changes and adaptations, underlying notions of survival and resilience remained integral to the typology. In essence, the tall house functions less as an object to be preserved than as a historical vessel that once enabled cultural survival. Its dissolution does not signify cultural loss but rather reflects the community's capacity to recalibrate the meaning of heritage in response to evolving technological capabilities, environmental pressures, and socio-cultural priorities, ensuring that identity remains active, lived, and resilient. While the tall house may have emerged from conditions shaped by conflict and alliance, it is the continual process of transformation that sustained the resilience of the Melanau community. Ultimately, this evolution is driven not solely by physical form or social structure, but by heritage resilience itself. This conclusion also identifies avenues for further inquiry, particularly comparative studies of Melanau tall house architecture in relation to adjacent ethnic groups using decolonised materials, which may reveal more nuanced architectural imperatives and contribute to a broader, more integrated discourse on Bornean architecture.

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