

# 03

## **SUSTAINABLE WATERFRONT LANDSCAPE TO REVITALISE THE COASTAL HERITAGE OF TELUK SENGGAT, KOTA TINGGI, JOHOR**

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### **ABSTRACT**

The coastal heritage of Teluk Sengat in Kota Tinggi, Johor represents a complex intersection between natural ecosystems, cultural legacy, and human settlement patterns. As a historic port town situated along the Johor River, Teluk Sengat holds tangible and intangible heritage values that have evolved under pressures from climate change, rapid urbanisation, and unsustainable development. This study analyses the landscape character, environmental vulnerabilities, and socio-economic challenges of the area to propose a holistic, resilient design solution. A combination of qualitative methods including site inventory, stakeholder interviews, and literature review were used to inform the design strategies. By integrating heritage conservation, ecotourism infrastructure, and climate-sensitive planning, the project aims to regenerate the coastal identity of Teluk Sengat while supporting local communities and preserving biodiversity. The final proposal envisions a sustainable waterfront landscape that enhances cultural continuity, ecological resilience, and economic viability.

**Keywords:** Coastal Heritage Conservation, Ecotourism Development, Climate-Resilient Design, Community-Based Planning, Integrated Coastal Landscape  
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### **PROJECT INTRODUCTION**

Teluk Sengat is one of Johor's coastal towns, which is rich in history and cultural traditions. However, it faces modern challenges that threaten its identity and natural systems. Once a thriving fishing hub and maritime node, the town now contends with rising sea levels, polluted shorelines, and loss of traditional livelihoods. Coastal landscapes are particularly vulnerable due to their transitional nature between land and sea. Teluk Sengat faces natural processes such as erosion, tidal shifts, and storm surges, as well as human-induced factors including land reclamation, overfishing, and unmanaged tourism. This project seeks to address the vulnerability of the town by exploring how coastal heritage can be safeguarded and reimagined through sustainable design for waterfront landscape.

Teluk Sengat, traces its origins to the early 1900s as a modest fishing village known for its strategic position within the maritime trade routes of southern Johor. By the mid-20th century, it grew into a bustling port town, with its jetty serving as a key node for rubber and seafood exports. The town's heritage is also tied to colonial-era influences, traditional Malay fishing practices, and crocodile farming, which became a unique local identity (neocities.org). Its heritage assets face increasing pressures from environmental degradation and modern development (Ahmad, 2013).

This study aims to preserve and revitalise the coastal heritage of Teluk Sengat by integrating sustainable landscape design, cultural conservation, and ecotourism development. Studies on cultural landscape and coastal identity through landscape design and recreational use are such as by Nazir et al. (2024) and Mohamad et al. (2024). This project focuses on identifying both tangible and intangible heritage values and proposing design strategies that protect the environment while benefiting local communities. Key issues of the site include the erosion of cultural identity due to rapid urbanisation, loss of biodiversity in mangrove zones, rising sea levels, and the deterioration of historical assets such as the jetty and waterfront spaces.

### **Problem Statement**

Teluk Sengat's coastal landscapes are increasingly vulnerable to both natural and human-induced challenges. Coastal erosion, sea level rise, tidal shifts, and storm surges, intensified by climate change, threaten the stability of its shorelines and the resilience of ecosystems. For example, by 2030, around 20,670 hectares of coastal land in Malaysia could be affected by sea level rise, with potentially significant impacts on coastal areas like Johor (myiklimysd.ukm.my). At the same time, unsustainable human activities such as land reclamation, overfishing, and unmanaged tourism accelerate environmental degradation and weaken natural coastal defense. These pressures not only compromise ecological health but also diminish the cultural, recreational, and economic value of the coastal area. Addressing these issues requires landscape design solutions that integrate ecological restoration, adaptive infrastructure, and community-sensitive interventions.



Figure 1: Key plan, location plan and site location

### **Significance of the Project**

The research highlights the urgent need for sustainable management to protect coastal areas from threats like climate change, pollution, overfishing, and rapid urbanisation. Its findings are intended to guide policy development that balances economic growth with environmental protection, ensuring the preservation of coastal heritage for future generations.

## LITERATURE REVIEW

Coastal areas are dynamic zones where land meets the sea. It is home to systems like beaches, wetlands, mangroves, estuaries, and coral reefs. These environments host rich biodiversity and provide essential services such as protecting against floods, supporting fisheries, and offering cultural spaces for local communities. However, they remain highly vulnerable to both natural processes and human impacts. Sea-level rise, pollution, overfishing, over tourism and unchecked urbanisation increasingly threaten these sensitive environments, calling for holistic strategies to preserve them (Axon et al., 2024; Pásková, et al., 2024).

Coastal heritage is more than just physical landmarks. It includes cultural practices, maritime traditions, and natural landscapes that together shape a community's identity. It consists of tangible heritage such as ports, jetties, shipyards, and architecture, and intangible heritage like storytelling, rituals, fishing practices, and oral traditions (Vallega, 2003; Vladimirova, 2016). These elements give meaning to coastal life and reflect how communities have interacted with marine environments over time. Protecting coastal heritage ensures continuity across generations, promoting both environmental and cultural resilience.



Figure 2: Tangible heritage: Structure of Teluk Sengat Jetty (neocities.org)



Figure 3: Intangible heritage: Fishing tradition in Teluk Sengat (neocities.org)

### Precedent studies

To address challenges, sustainable strategies are essential. The precedent studies include studies on structural stabilisation (e.g., seawalls, breakwaters), beach nourishment, green infrastructure, and coastal vegetation management (by Kim et al., 2018; Prato et al., 2016; Karcher, 2023). More innovative approaches such as Integrated Coastal Zone Management (ICZM) promote long-term planning that balances development with heritage protection. Likewise, cultural and rural tourism can generate economic value while raising awareness about conservation. When implemented together, these strategies support communities in preserving their heritage, sustaining livelihoods, and adapting to climate change.



Figure 4: Batu Ferringhi's Beach nourishment programme at Penang(Kim et al., 2018)

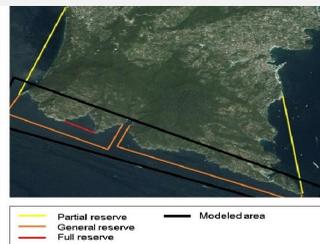


Figure 5: Zoning map for coastal and marine reserves in the modelled area in Portofino(Barrier et al., 2014)



Figure 6: The living shoreline project in Hatteras Village, North Carolina (nccoast.org)

Table 1: Precedent Studies Outcome

| Precedent Study   | Location            | Key Strategies for Conservation   | Outcomes and Takeaways  |
|---|---------------------|---|---|
| Beach Nourishment Programme (Kim et al., 2018)                        | Penang, Malaysia    | Beach nourishment, coastal rehabilitation, ICZM   | Improved water quality and erosion control, boosted tourism and economy, and stronger coastal protection. |
| Marine Protected Area (MPA) (Barrier et al., 2014; Prato et al, 2016) | Portofino, Italy    | Strict access control, sustainable tourism, ecological awareness, fishing regulations       | Supports marine life, tourism income, and community awareness.  |
| Living Shorelines Project (Karcher, 2023)                             | North Carolina, USA | Natural shorelines (oyster reefs, salt marshes), riparian buffers, permeable infrastructure | Less erosion, better habitats, and stronger shorelines.   |

## METHODOLOGY

The project adopted a qualitative mixed-methods approach. Site observations, heritage mapping, community interviews, and archival research informed the understanding of tangible and intangible values. Tools such as suitability analysis were used to layer spatial information. The research also prioritised local knowledge to ensure that proposed design development resonate with community aspirations and daily practices. The methodology also incorporated design thinking to iterate between problem framing, ideation through schematic plans.



### 01 Site Observation

Physically explore and document the site inventory to note existing features and visual aspects for analysis.



### 02 Interview

Asking locals including community elders, fishermen and local business owners on historical background, cultural, social and development of the area.



### 03 Literature Review

Researching through articles, journals and books to find a related data analysis to the site area.



### 04 Government

Asking local authority's officers for local development plan, current issues, conservation and tourism promotion and development initiatives.

## ANALYSIS AND FINDINGS

### Aim and objectives

This study aims to identify and protect the coastal heritage of Teluk Sengat through landscape design by looking at its history, environment, and community values. It focuses on finding long-term ways to keep the area safe and alive through ecotourism, cultural preservation, and environmental care.

The objectives are to identify the coastal heritage values, both physical and cultural, and to understand their strengths and challenges. It also aims to suggest suitable design strategies to protect and improve these values. Lastly, the study promotes eco-friendly tourism that connects nature, culture, and community activities in a sustainable way.

### Site inventory and analysis

There are 13 of attributes checklists listed with a comprehensive understanding to analyse the coastal heritage of Teluk Sengat. It is shown that every attribute is essential to provide a sustainable landscape design solutions to site.

Table 2: Site Inventory and Analysis Attributes Checklist

| Attributes             | Description  |
|------------------------|--|
| Site Context           | Location, history, and environment—important for sustainable tourism planning.               |
| Landscape Morphology   | Natural landforms like hills and water bodies—helps identify conservation and tourism areas. |
| Heritage Values        | Cultural, historical, and natural significance—preserves identity and attracts tourists.     |
| Socio-economic         | Tourism’s impact on local economy and community—ensures fair benefit distribution.           |
| Land Use               | How land is used to support conservation and sustainable development.                        |
| Microclimate           | Local climate conditions—important for designing comfortable tourist facilities.             |
| Topography             | Physical layout of the area—affects access, infrastructure, and activity planning.           |
| Soil                   | Soil quality—vital for vegetation and ecosystem health.                                      |
| Hydrology              | Water resources—important for flood control, water quality, and habitat.                     |
| Circulation & Access   | Tourist movement and transport—key to a positive visitor experience.                         |
| Facilities & Utilities | Amenities like restrooms and waste systems—ensure comfort and sustainability.                |
| View & Senses          | Scenic views, sounds, and air quality—enhance tourist appeal.                                |
| Vegetation & Wildlife  | Biodiversity—supports conservation and ecological health.                                    |

### Suitability analysis

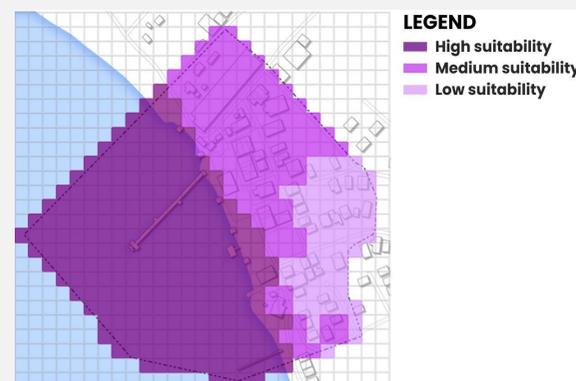


Figure 7: Overall suitability map

Suitability analysis performed show that high suitability areas offer scenic views, stable land, good access, rich biodiversity, and strong tourism benefits. Medium suitability areas need restoration, have moderate terrain and infrastructure challenges, and require targeted improvements. Low suitability areas are mostly residential with poor access, degraded ecology, and limited community or tourism value.

Building on the overall analysis, Teluk Sengat presents a variety of opportunities that shape its development potential. The site is rich in cultural heritage, coastal ecosystem, and it has a strategic location that offer significant prospects for eco-tourism, community engagement, and environmental conservation. However, challenges such as flooding risks, outdated infrastructure, and environmental degradation require careful planning and sustainable strategies to balance growth with preservation as shown in the cross analysis in Figure 8.

| Coastal Heritage and Landscape Conservation Features | Heritage Values | Socio-economic | Land Use | Microclimate | Topography | Soil | Hydrology | Facilities and Utilities | Circulation and Accessibility | View and Sense | Vegetation | Wildlife |
|--|-----------------|----------------|----------|--------------|------------|------|-----------|--------------------------|-------------------------------|----------------|------------|----------|
| Tangible Heritage                                    | ●               | ◐              | ◐        | ◐            | ◐          | ○    | ●         | ◐                        | ◐                             | ●              | ◐          | ◐        |
| Intangible Heritage                                  | ●               | ◐              | ◐        | ●            | ○          | ○    | ○         | ○                        | ◐                             | ●              | ◐          | ○        |
| Geographical Features                                | ●               | ●              | ●        | ●            | ◐          | ◐    | ●         | ○                        | ◐                             | ●              | ●          | ●        |
| Traditional Cultural Practices                       | ●               | ◐              | ◐        | ◐            | ○          | ○    | ○         | ◐                        | ○                             | ●              | ◐          | ○        |
| Conservation and Preservation                        | ●               | ●              | ◐        | ●            | ◐          | ◐    | ●         | ◐                        | ◐                             | ●              | ●          | ●        |
| Sustainable Strategies                               | ●               | ●              | ◐        | ●            | ◐          | ◐    | ●         | ○                        | ●                             | ●              | ●          | ●        |

● Highly Suitable    ◐ Partially Suitable    ○ Not Suitable

Figure 8: Cross analysis

### Synthesis

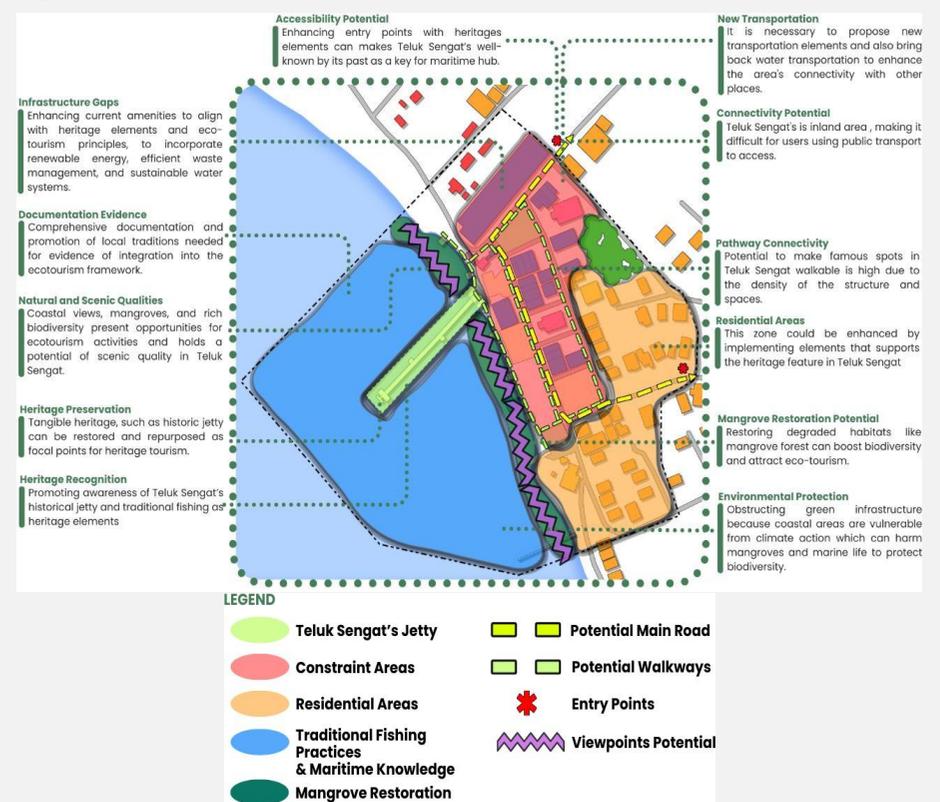


Figure 9: Synthesis map

Based on the synthesis map and summary in Figure 9 Teluk Sengat holds strong potential for eco-tourism because of its unique combination of cultural heritage and natural beauty. The area can be revitalised by improving transportation access, which would make it easier for tourists to visit. Environmental protection efforts such as conserving coastal ecosystems and managing waste would help preserve the natural landscape. Additionally, involving the local community in tourism planning and activities ensures that development is sustainable and benefits residents economically and socially. Together, these efforts can transform Teluk Sengat into a vibrant, eco-friendly destination that celebrates both nature and culture.

## DESIGN STRATEGIES

The design strategies for the revitalisation of Teluk Sengat focus on eight key areas: Heritage conservation strategies, mangrove and habitat restoration, community engagement and education, sustainable amenities, eco-tourism infrastructure, water-based tourism design, climate-resilient design, and connectivity enhancements. These categories provide a comprehensive framework to balance cultural preservation, ecological restoration, and sustainable development.



Figure 10: Design strategies attributes

Table 3: Design strategies

| Attributes  | Strategy                              | Description  |
|---|---------------------------------------|--|
| <b>Heritage Conservation</b><br>(Barianaki et al., 2024)      | Adaptive Reuse of Historic Structures | Restore and repurpose the historic jetty and use it to highlight Teluk Sengat's cultural and ecological heritage.      |
|   | Interpretive Signage and Trails       | Create engaging walkways that share stories of fishing traditions and local practices while connecting key landmarks.  |
|   | Cultural Education                    | Introduce a heritage trail linking traditional fishing zones, villages, and cultural landmarks.                        |
| <b>Community Engagement</b><br>(Khakzad & Griffith, 2016)     | Cultural Workshops                    | Organise workshops on traditional fishing techniques, crafts, and heritage.  |
|   | Public Participation                  | Host cultural events and festivals to foster partnerships and raise awareness about Teluk Sengat's traditions.         |
| <b>Mangrove and Habitat Restoration</b><br>(Sam et al., 2023) | Mangrove Rehabilitation               | Reestablish degraded mangrove areas to enhance biodiversity, stabilise shorelines, and educate visitors.               |
|   | Biodiversity Corridors                | Introduce native plant species to improve connectivity between habitats and support local wildlife.                    |
| <b>Sustainable Amenities</b><br>(Papallou et al., 2024)       | Eco-Friendly Tourism Facilities       | Install solar-powered lighting, renewable energy-based systems, and recycling stations to reduce environmental impact. |
|   | Nighttime Experience                  | Use low-impact lighting systems to minimise light pollution and maintain safety for visitors.                          |
| <b>Eco-Tourism Infrastructure</b><br>(Samal & Dash, 2023)     | Walkability and Accessibility         | Develop pedestrian-friendly pathways connecting attractions like the jetty, scenic viewpoints, and cultural spaces.    |
|   | Elevated Viewing Platforms            | Provide panoramic views of the Johor River and its surroundings, highlighting ecological and cultural significance.    |
|   | Water-Based Connectivity              | Enhance transportation options to access Teluk Sengat via water routes.  |

|   |                          |   |
|---|--------------------------|---|
| <b>Water-Based Tourism Design</b><br>(Pásková et al., 2024) | Activity Encouragement   | Expand activities like kayaking and small eco-cruises to ensure minimal ecological disruption while enhancing visitors' experience. |
|   | Design                   | Create observation platforms to showcase marine life and fishing techniques in an interactive, educational way.                     |
|   | Submerged Platform       | Utilise permeable paving and bioswales to absorb and filter stormwater, reducing flood risks.                                       |
| <b>Climate-Resilient Design</b><br>(Chohan et al., 2024)    | Flood Management         | Introduce coastal vegetation to mitigate storm surges, prevent erosion, and stabilise soil.   |
|   | Vegetation for Stability |   |
| <b>Connectivity Enhancement</b><br>(Geurs et al., 2023)     | Transport Hubs           | Develop hubs with pedestrian and cycling options to connect Teluk Sengat to neighbouring areas.                                     |
|   | Eco-Tourism Plaza        | Create a vibrant gathering space for visitors, cultural events, and traditional performances.                                       |
|   | Cultural Event Space     | Designate spaces for hosting festivals and showcasing traditional heritage.   |

From design strategies above, the comprehensive design plan organises the coastal area into functional zones to ensure a harmonious integration of heritage, ecology, and tourism. Figure below outlines design strategies plan for Teluk Sengat, focusing on heritage conservation, eco-tourism, and sustainability. Key zones include the coastal heritage zone for cultural preservation, the activity and water recreation zone for eco-tourism, and the mangrove conservation zone for biodiversity. Sustainable amenities and infrastructure, like walkways and renewable energy systems, enhance connectivity while maintaining ecological and cultural integrity. The approach balances conservation, tourism, and sustainability for Teluk Sengat's revitalisation.

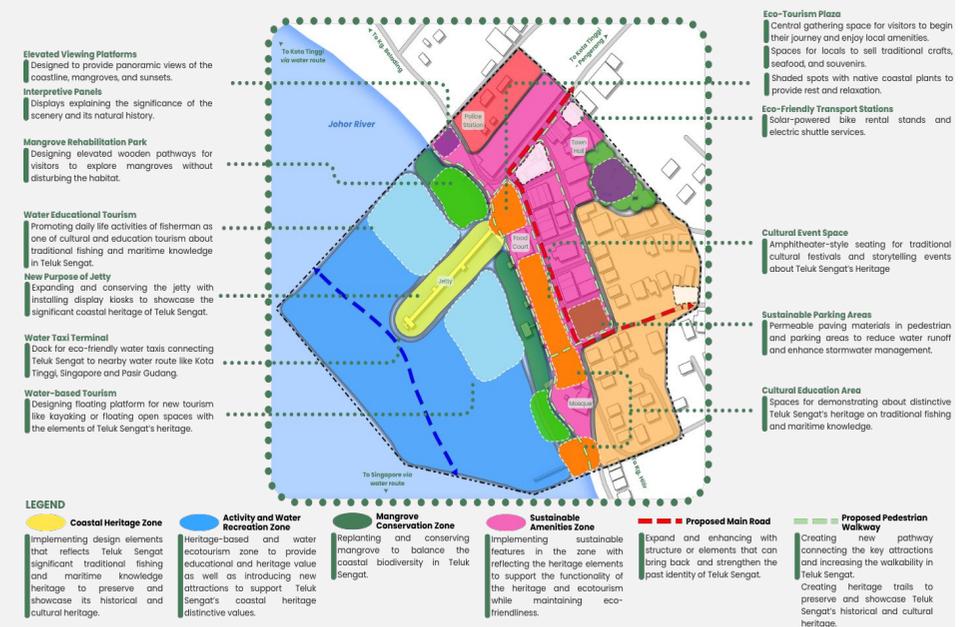


Figure 11: Design plan overview

## LANDSCAPE MASTERPLAN DEVELOPMENT

### Introduction

The design development for Teluk Sengat focuses on transforming its coastal heritage into a resilient, community-driven landscape that celebrates culture, supports biodiversity, and promotes sustainable tourism.

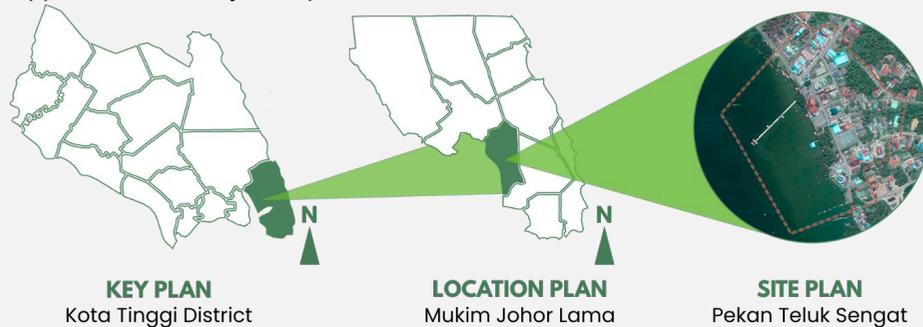


Figure 12: Site section for masterplan

### Potentials

**01 Rich Nature** - The site has mangrove and river views that are great for nature and eco-tourism.

**02 Cultural Value** - The old jetty and local fishing traditions give the place a strong heritage identity.

### Issues

**01 Flooding & Erosion** - The area often floods and the shore is wearing away due to rising sea levels.

**02 Heritage Loss** - Old sites and traditions are fading because of modern development and lack of care.

### Design strategies



- 1. PROTECT NATURAL COASTAL AREAS**
  - Keep mangrove forests as natural buffers and wildlife habitats.
  - Restore damaged mangroves using native plants.
  - Avoid building in sensitive environmental areas.
  - Set up buffer zones to protect ecosystems and support wildlife.



- 2. USE SUSTAINABLE AND SMART LANDSCAPE IDEAS**
  - Upgrade the old jetty for multiple uses.
  - Use green materials and renewable energy like solar lights.
  - Mix traditional planting styles with eco-friendly design.



- 3. CELEBRATE COMMUNITY AND CULTURE**
  - Turn open spaces into art galleries and stages for cultural shows and highlight local identity.
  - Design trails and signs that guide visitors through history and nature.
  - Create open, welcoming plazas for events and gatherings.

Figure 13: Selected design strategies

### Design aim

To revitalise Teluk Sengat's coastal heritage by transforming its historic jetty and cultural landscape into a vibrant and sustainable eco-tourism destination. This effort integrates ecological restoration, heritage preservation, and active community engagement.

### Design objectives

**01** To enhance coastal resilience and ecological function.



**02** To promote cultural heritage and community identity.



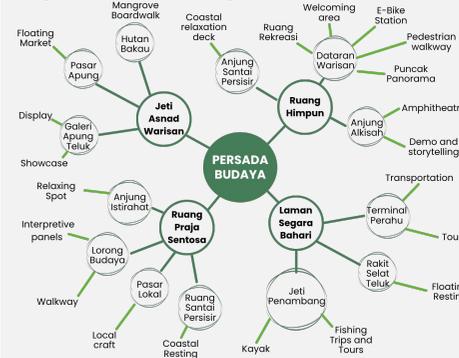
**03** To foster sustainable tourism and educational engagement.



## Design concept

The concept of **PERSADA BUDAYA** is centred on the revitalisation of Teluk Sengat's cultural and ecological heritage through a design approach that integrates both cultural and ecotourism elements. The term "Persada" refers to spaces associated with water-based activities and entertainment, such as jetties, waterfronts, and coastal areas. In contrast, "Budaya" encompasses traditional Malay knowledge and practices, particularly those related to fishing and transportation. Together, these ideas form a holistic vision for preserving and celebrating the region's identity.

### Space development



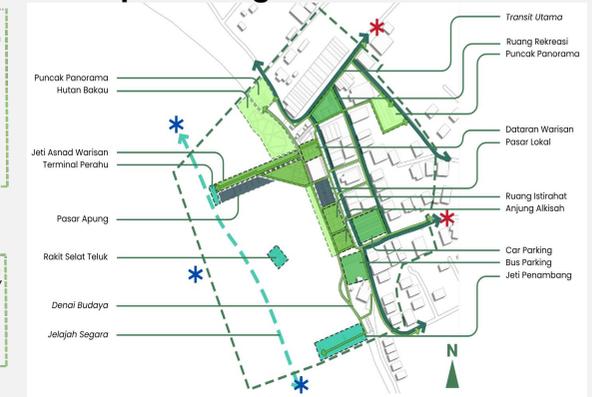
| SPACES                  | SUB-SPACES | ELEMENT              | ACTIVITIES   |
|-------------------------|------------|----------------------|--|
| A Jeti Asnod Warisan    | 1          | Galeri Sejarah Teluk | • Heritage Exhibition<br>• Snowcasing  |
|                         | 2          | Pasar Apung          | • Floating Market<br>• Selling fresh caught fish   |
|                         | 3          | Hutan Bakau          | • Mangrove Park<br>• Elevated Boardwalk<br>• Eco-tours<br>• Mangrove replanting                      |
| B Ruangan Himpun        | 1          | Dataran Warisan      | • Sightseeing<br>• Photography<br>• Snowcasing   |
|                         | 2          | Anjung Alkisah       | • Amphitheatre<br>• Seating area<br>• Demo & Storytelling  |
| C Ruangan Praja Sentosa | 1          | Anjung Istirahat     | • Relaxing spot<br>• Heritage and fishing knowledge  |
|                         | 2          | Lorong Budaya        | • Interpretive panels and signage<br>• Walkways<br>• Walking<br>• Board storytelling<br>• Snowcasing |
|                         | 3          | Pasar Lokal          | • Marketplace<br>• Selling local goods and services  |
| D Laman Segara Bahari   | 1          | Terminal Perahu      | • Transportation<br>• Tours<br>• Boat cruise   |
|                         | 2          | Serbang Selat Teluk  | • Floating resting platform<br>• water route<br>• relaxing on water                                  |
|                         | 3          | Jeti Penambang       | • Fishing signage<br>• Fishing trips and tours<br>• Kayaking   |

Figure 14: Space programming diagram and detail table

### Functional diagrams



### Conceptual diagram



### Schematic plan



Figure 15: Design development consisting of functional and conceptual diagrams, and schematic plan

## Planting concept

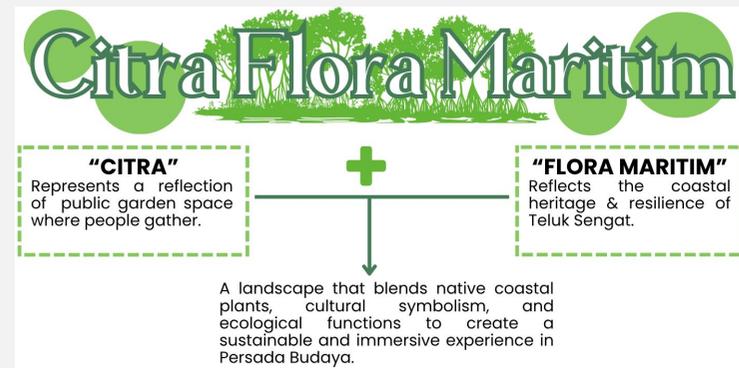


Figure 16a: Planting concept diagram

The planting concept for Persada Budaya, titled "CITRA FLORA MARITIM", is designed to reflect the coastal identity, cultural heritage, and ecological resilience of Teluk Sengat. This concept integrates native vegetation with symbolic and functional landscape elements to create a sustainable, meaningful, and immersive environment. It supports the overall design narrative by enhancing user experience, promoting biodiversity, and reinforcing the site's connection to its natural and cultural context.

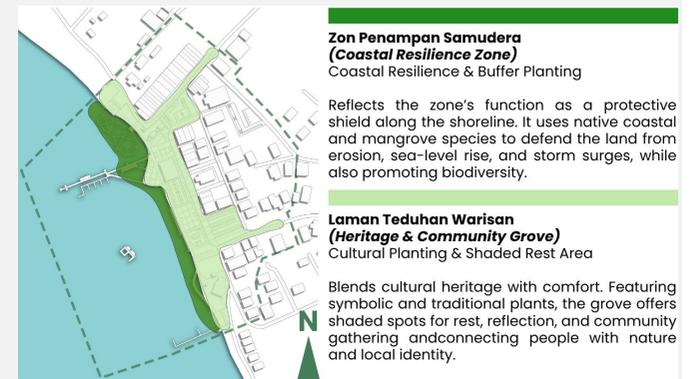


Figure 16b: Planting approach conceptual layout

## Preliminary masterplan



Figure 17: Preliminary masterplan

This preliminary masterplan outlines the final design phase before moving to the final proposed stage. It features a well-planned coastal layout with a mix of buildings, green spaces, and waterfront elements. The coastline includes jetty for water activities, while buildings are arranged in both grid and natural patterns. Green areas, including a central park, add recreational and ecological value. Roads and walkways connect key cultural, community, and natural sites, creating a balanced and accessible environment.

## Landscape masterplan



Figure 18: Landscape masterplan

This landscape masterplan illustrates the spatial arrangement of attractions within the coastal area. It highlights important landmarks, circulation routes, and public spaces that support cultural, ecological, and community-focused activities.

## Space design

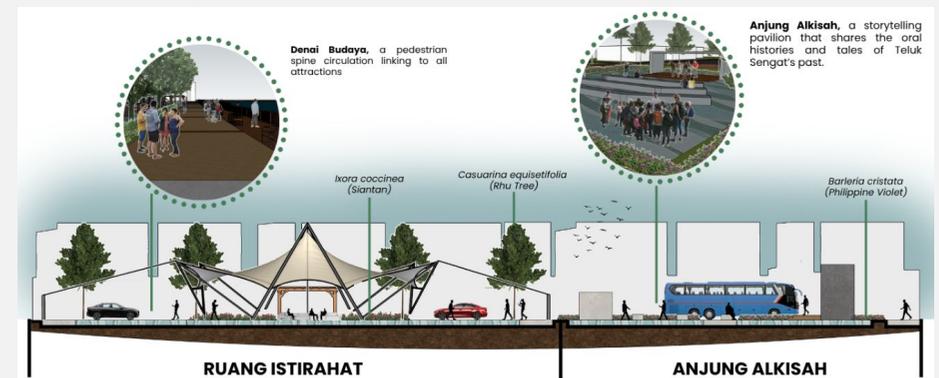


Figure 19: Section cut that consist of Ruang Istirahat, Anjung Alkisah and Denai Budaya with several perspectives.

Ruang Istirahat is a shaded rest area with comfortable seating under Ixora and Rhu trees (*Casuarina equisetifolia*). It includes nearby parking to ensure easy access for visitors. Anjung Alkisah is a storytelling pavilion where visitors can enjoy local stories and learn about Teluk Sengat's culture. Surrounded by Philippine Violet (*Barleria cristata*), it offers a warm and inviting space for sharing heritage



Figure 20: Section cut that consist of Pasar Lokal, Dataran Warisan and the existing building, Medan Selera with some thumbnail perspectives.

Pasar Lokal is a local market that offers traditional foods, goods, and essentials. Shaded by Rhu trees (*Casuarina equisetifolia*), it provides a comfortable and natural setting for both vendors and visitors.

Dataran Warisan is a heritage plaza that serves as a central space for cultural events and public celebrations. Landscaped with Malapar trees (*Pongamia pinnata*), known for reinforcing the area's cultural identity.



Figure 21: Sectional perspective for spaces called Anjung Santai Persisir and Ruang Istirahat



Figure 22: View towards Anjung Santai Persisir, where people can sit and relax while enjoying the scenic view of sunset with Johor River.



Figure 23: View towards Ruang Istirahat, a small resting pavilion offering shelter and comfort along pedestrian pathways.



Figure 24: Sectional Perspective for Galeri Apung Teluk and its surroundings.



Figure 25: View towards Galeri Apung Teluk showcasing Teluk Sengat's coastal culture, history, and art.

## DETAILED DEVELOPMENT PLAN

### Site Introduction

The selected area for detailed development plan consists the area of Transit Utama, Dataran Warisan, Pasar Lokal, Denai Budaya, Anjung Santai Persisir and the existing building at the centre of the area called Medan Selera Teluk Sengat.

By detailing the spatial configurations, circulation systems, landscape materials, and supporting amenities, the development plan seeks to bridge the gap between concept and implementation, ensuring that the proposal is contextually appropriate, community-oriented, and future-proof.

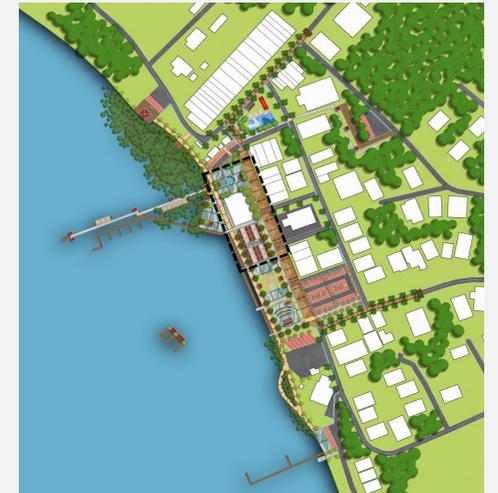


Figure 26: Highlighting the selected area for detailed development plan at the previous masterplan

### Site Justification

The selected area for the detailed development plan was chosen due to its strategic location along the riverfront and its direct connection to key heritage elements such as the old jetty and nearby community spaces. This area acts as the heart of Teluk Sengat, where daily activities, fishing practices, and local interactions take place, making it ideal for reinforcing cultural identity through design. Its proximity to the mangrove belt also offers opportunities for ecological restoration and education. Compared to other parts of the site, this zone holds the strongest potential for combining tourism, conservation, and community use in one integrated, accessible space, making it the most suitable focus for detailed development.

### Detailed development plan



Figure 27: Detailed development plan

#### 01 Transit Utama

A vibrant street cultural boulevard that celebrates community identity through walkable spaces, shaded greenery, artistic pavement design, and interactive public seating, inviting pedestrians to experience culture, connectivity, and creativity in motion.

#### 02 Dataran Warisan

A dynamic cultural plaza that serves as a gathering hub for heritage appreciation and community interaction by iconic canopy structures, vibrant walkways, and open spaces that celebrate local identity and tradition.

### 03 Anjung Santai Persisir

A coastal deck to relax and enjoy the view of Sungai Johor and the sunset, with seating and hammock floors in the shade of the indigenous mangroves.

### 04 Denai Budaya

A shaded heritage walks with storyboards that share the culture and history of Teluk Sengat.

### 05 Pasar Lokal

A local market that reflects the everyday life of Teluk Sengat, offering fresh produce, local delicacies, and traditional goods. It brings back the charm of the town's trading culture while supporting community and heritage.

### Space design



Figure 28: Section cut that consist the space of Transit Utama and Dataran Warisan



Figure 29: Compilation of perspective that view towards Transit Utama, framed by rows of trees and artistic pavements, where shaded walkways and inviting public seating create a lively corridor of movement, culture, and connection.



Figure 30: Compilation of perspective that view towards Dataran Warisan, a lively cultural plaza opens up with striking canopy structures and vibrant walkways, where open spaces invite community gatherings, heritage celebrations, and moments of creative expression.



Figure 31: Section cut that consist the space of Anjung Santai Persisir, Denai Budaya and Pasar Lokal



Figure 32: View towards Anjung Santai Persisir: A tranquil coastal deck nestled among mangroves, where shaded seating and hammock floors invite visitors to unwind and take in the serene views of Sungai Johor and the setting sun.



Figure 33: View towards Denai Budaya: A peaceful heritage walk winds through shaded paths, where storyboards gently unfold the rich culture and history of Teluk Sengat, inviting visitors to explore and reflect.



Figure 34: Compilation of perspective that view towards Pasar Lokal, A lively local market scene unfolds, where stalls brim with fresh produce and traditional goods, capturing the everyday rhythm and rich trading heritage of Teluk Sengat.



Figure 35: Aerial view from Dataran Warisan, showcasing the vibrant atmosphere of Teluk Sengat's cultural ecotourism, where heritage, nature, and community spaces connect seamlessly.

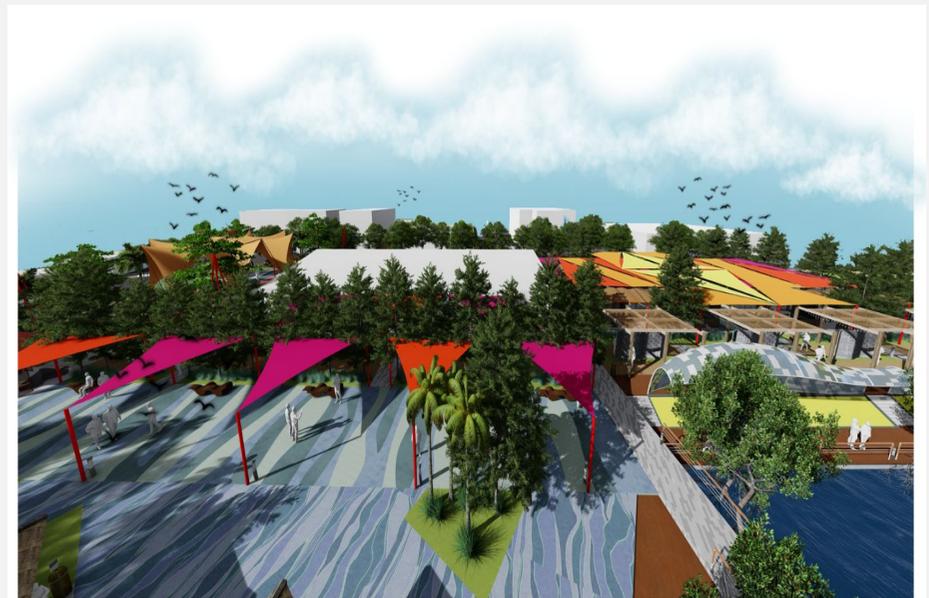


Figure 36: Aerial View of Teluk Sengat Cultural Spine: A vibrant blend of heritage, community spaces, and nature, connecting Denai Budaya, Dataran Warisan, and Pasar Lokal in one seamless landscape.

### Softscape detailing

The softscape plan follows the Citra Flora Maritim concept, blending coastal resilience with cultural identity. It organizes plants into two zones—Zon Pemampsan Samudera for native coastal species that protect the environment, and Laman Teduhan Warisan for traditional plants that reflect local heritage. This design supports both ecological health and cultural value, creating a meaningful and functional landscape.



| No. | Symbol | Scientific Name                | Common Name          | Nos |
|-----|--------|--------------------------------|----------------------|-----|
| 1.  |        | <i>Cassia siamea</i>           | Johar                | 27  |
| 2.  |        | <i>Terminalia catappa</i>      | Ketapang             | 4   |
| 3.  |        | <i>Terminalia molinellii</i>   | Spiny Bucida         | 8   |
| 4.  |        | <i>Casuarina equisetifolia</i> | Rhu Pantai           | 29  |
| 5.  |        | <i>Bruguiera sexangula</i>     | Bakau Tumu Puteh     | 45  |
| 6.  |        | <i>Cocos nucifera</i>          | Coconut Palm         | 3   |
| 7.  |        | <i>Adonidia merrillii</i>      | Manila Palm          | 9   |
| 8.  |        | <i>Bougainvillea glabra</i>    | Great Bougainvillea  | 4   |
| 9.  |        | <i>Hibiscus rosa-sinensis</i>  | Chinese Hibiscus     | 44  |
| 10. |        | <i>Jasminum grandiflorum</i>   | Catalonian Jasmine   | 94  |
| 11. |        | <i>Jasminum sambac</i>         | Arabian Jasmine      | 46  |
| 12. |        | <i>Ruellia tuberosa</i>        | Minnieroot           | 50  |
| 13. |        | <i>Pandanus pygmaeus</i>       | Dwarf Pandan         | 305 |
| 14. |        | <i>Clerodendrum inerme</i>     | Seaside Clerodendrum | 120 |
| -   |        | <i>Axonopus compressus</i>     | Cowgrass             | -   |

● Tree   
 ● Palm   
 ● Shrub   
 ● Groundcover

Figure 37: Softscape plan and schedule

### Hardscape detailing

The hardscape plan for Teluk Sengat supports movement and place identity through well-arranged structures and surfaces. It includes pavilions, seating, canopies, and decorative paving to improve comfort, define activity zones, and match the site's natural and cultural setting. Each element is placed to ensure accessibility, visual harmony, and a resilient coastal experience.

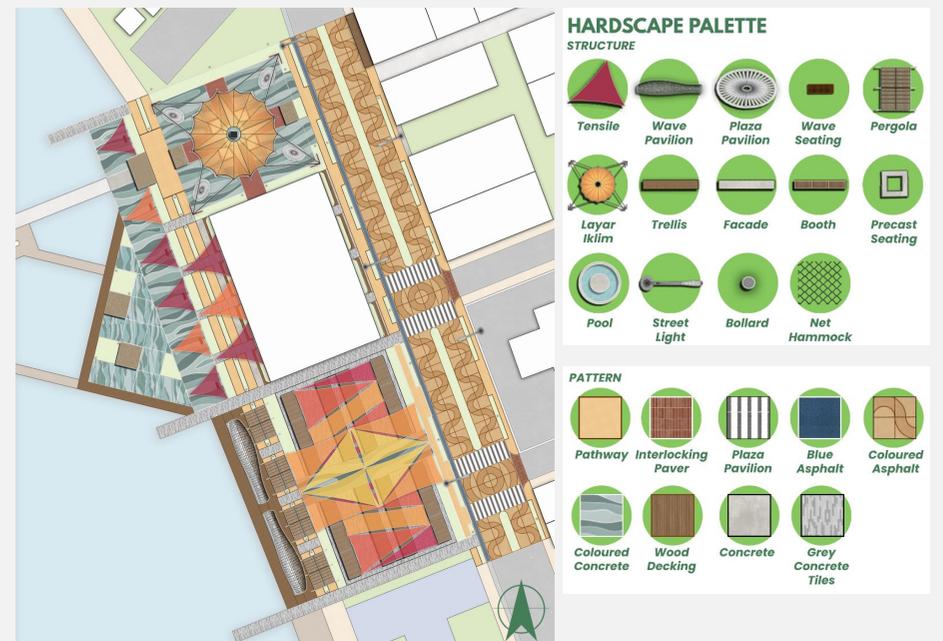


Figure 38: Hardscape plan and palette



Figure 39: View at another area of Dataran Warisan provided with canopy and customised seating on a coloured concrete that reflecting the Teluk Sengat's identity.

## Innovative design elements

**LAYAR IKLIM** is an innovative design element that has been proposed for the ecotourism development at Teluk Sengat. Layar Iklim is a multifunctional canopy structure that serves as both a weather-responsive installation and a cultural landmark. This element is inspired by the traditional *layar* (sails) of Malay fishing boats, symbolising the maritime heritage of the local community while addressing environmental and climatic challenges of the coastal site.



Figure 40: The view of Layar Iklim at the site's area

The canopy comprises a series of layered, sail-like fabric panels stretched across red structural frames. These panels are arranged in an uneven, dynamic configuration to simulate the visual effect of sails billowing in the wind. The form not only evokes a sense of motion but also enhances the spatial experience beneath the structure.

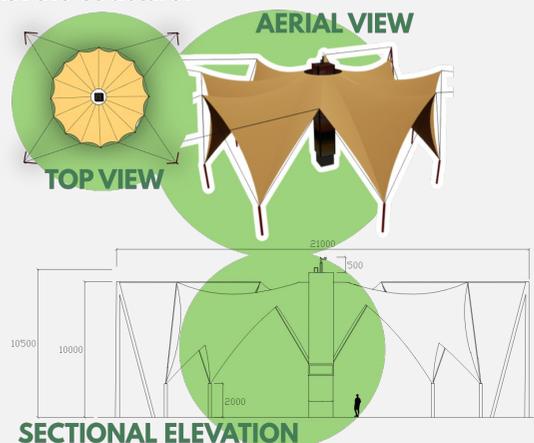


Figure 41: The layout illustration for Layar Iklim

**Pancang Iklim (Weather Indicator):** This vertical element functions as a modern totem pole, symbolising climate data and serving as a visual reference for environmental conditions. It reinforces the theme of climate awareness and acts as a cultural landmark within the site.

**Lembar Layar (Canopy):** Designed to mitigate strong coastal winds through its semi-perforated, wavy structure. The layering allows for controlled light penetration while maintaining an open and breathable environment underneath. This design enhances user comfort and supports passive climate control strategies.



Figure 42: Pancang Iklim and Lembar Layar

## CONCLUSION

In conclusion, this project highlights the urgent need to protect and revitalise the coastal heritage of Teluk Sengat through sustainable landscape design. By analysing the site's historical, environmental, and cultural values, the study identified a series of integrated strategies—ranging from mangrove restoration and eco-tourism planning to community-focused spaces and climate-responsive design. The final proposal aims to preserve local identity while supporting environmental resilience and economic growth. This design approach does not only strengthens Teluk Sengat's role as a heritage-rich coastal town but also offers a model for future coastal developments in Malaysia and beyond.

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