Community Action Plan

PANTAI PERINGGIT MELAKA

R4C
Identify. Understand. Act.

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RESILIENT CITIES NETWORK

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Foreword

بِسْمِ اللَّهِ الرَّحْمَٰنِ الرَّحِيمِ

Assalamualaikum Warahmatullahi Wabarakatuh, greetings of peace, Salam Melakaku Maju Jaya, Rakyat Bahagia, Menggamit Dunia, Bijak Laksana Tuah, Berani Laksana Jebat and Salam Malaysia MADANI.

Praise be to Allah, all thanks and gratitude to the Almighty Allah S.W.T, for with His grace and blessings, the implementation of the Community Action Plan (CAP) under the Resilience For Communities (R4C) project has been successfully carried out in the state of Melaka.

This effort demonstrates a significant approach that places the community at the heart of strengthening urban resilience. Based on the principles of inclusivity, preparedness, and sensitivity to current realities, this initiative focuses on today's key challenges, particularly climate change and increasingly complex development pressures.

This approach proves that a city's resilience is not solely defined by physical capacity or infrastructure but also driven by community unity and collective awareness of environmental sustainability and societal well-being.

Therefore, I would like to express my deepest appreciation to all parties involved, especially the Historic Melaka City Council (MBMB), Resilient Cities Network, Z Zurich Foundation, and other strategic partners for their strong commitment and close collaboration in making this initiative a success.

In conclusion, I urge that such efforts continue to be expanded and strengthened. May the implementation of this CAP serve as a catalyst for a collective movement towards building a greener, more resilient, and inclusive Melaka, for the well-being of today's citizens and the continuity for future generations.

"MELAKAKU MAJU JAYA, RAKYAT BAHAGIA, MENGGAMIT DUNIA"
"WISE LIKE TUAH, COURAGEOUS LIKE JEBAT"

DATUK SERI UTAMA AB RAUF BIN YUSOH
CHIEF MINISTER OF MELAKA

Foreword

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Climate change is a real and pressing challenge that directly affects public well-being and the sustainability of urban development. The Resilience For Communities (R4C) initiative under the Urban Climate Resilience Program (UCRP) comes at the right time to strengthen community preparedness and resilience against risks such as flooding and heatwaves.

The Community Action Plan (CAP) developed through this initiative is the result of a collaborative process involving government agencies, local communities, and international partners. It represents an inclusive and forward-looking approach for building communities that are aware, responsive, and accountable to their surrounding environments.

I believe the implementation of this CAP will bring long-term benefits to the target communities and serve as a model of best practice for other areas across the state of Melaka. Congratulations to all parties who have contributed to the success of this meaningful initiative.

YB DATUK RAIS BIN DATUK WIRA YASIN
SENIOR EXCO FOR HOUSING, LOCAL GOVERNMENT, DRAINAGE, CLIMATE CHANGE AND DISASTER MANAGEMENT

Foreword

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The Melaka Historic City Council (MBMB), as one of the local governments, remains steadfast in its commitment to tackling climate change through a holistic and inclusive approach. The Community Action Plan (CAP), implemented under the Resilience for Communities (R4C) project, reflects MBMB's aspiration to shape Melaka into a city that is not only historic, but also smart and sustainable.

Through the active involvement of the communities in Pantai Peringgit as well as Kampung Morten, this CAP has been developed as a strategic guide that not only assesses current risks and needs but also outlines high-impact, community-driven actions ready for implementation. It also reinforces cross-sector collaboration in driving comprehensive urban resilience.

I deeply appreciate the steadfast support from all involved, and I hope that the CAP's implementation will continue to inspire the transformation of our living environment into one that is safer, greener, and more agile in the face of future challenges.

YBHG. DATUK HJ. SHADAN BIN HJ. OTHMAN
MAYOR OF MELAKA HISTORIC CITY COUNCIL

Community Acknowledgment

This Community Action Plan would not have been possible without the invaluable participation, knowledge, and commitment of the residents of Pantai Peringgit. We extend our heartfelt appreciation to every community member who shared their experiences, insights, and aspirations throughout this collaborative process under the Urban Climate Resilience Program (UCRP), as part of Resilience for Communities (R4C).

Your willingness to share local knowledge and concerns has been instrumental in shaping practical, community-led strategies to address increasing risks of heat stress and flooding. This plan is a testament to your strength, unity, and proactive spirit in building a safer, more resilient and sustainable community for present and future generations.

We also acknowledge the contributions of local leaders, volunteers and partner organizations whose support in facilitating workshops, discussions and outreach activities ensured an inclusive and impactful process.

Together, we are not just responding to climate challenges – we are leading change from within.

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Abbreviations

CAP	Community Action Plan
CRMC	Climate Resilience Measurement for Communities
CRO	Chief Resilience Officer
DID	Department of Irrigation and Drainage
DOSM	Department of Statistics Malaysia
EWS	Early Warning System
EXCO	State Executive Council
JAPERUN	Jawatankuasa Pembangunan dan Penyelarasan Dewan Undangan Negeri
JPKK	Jawatankuasa Pembangunan dan Keselamatan Kampung
JPS	Department of Drainage and Irrigation (Jabatan Pengairan dan Saliran)
Kampung	Compact urban settlement of informal origin, with occasional traditional traits
MBMB	Melaka Historic City Council (Majlis Bandaraya Melaka Bersejarah)
MERCY Malaysia	Malaysian Medical Relief Society
NBS	Nature Based Solutions
NTU	Nanyang Technological University
Perangkaan	Jabatan Perangkaan Malaysia
PLI	Poverty Line Income
R4C	Resilience for Communities
RCIFUNDs :	R4C's Resilient Community Impact Funds
R-Cities	Resilient Cities Network
UNESCO	United Nations Educational, Scientific and Cultural Organization

Community Action Plan Overview

The Resilience for Communities program aims to build sustainable and resilient communities that can withstand, recover from, and thrive in the face of climate-related disasters. Jointly implemented by Resilient Cities Network and Melaka Historic City Council with support from Z Zurich Foundation and Zurich Malaysia, the R4C program in Melaka blends place-based and community-centered approaches with Resilient Cities Network's urban resilience framework, connecting community initiatives to city systems while bridging stakeholder gaps to enhance urban resilience.

This document is the Community Action Plan for Pantai Peringgit, Melaka. It presents a cohesive vision and robust portfolio of actions to enhance community resilience, following comprehensive assessment and intensive engagements with community members and stakeholders.

VISION for Pantai Peringgit: A safe and connected community, united in facing climate challenges while building a foundation for collective well-being.

This document is structured as follows:

- **Introduction:** Provides background on the R4C program's origins, objectives and approach.
- **Our City:** Examines Melaka's urban context, governance structures and existing resilience initiatives.
- **Our Community:** Presents key findings from community assessments and engagement.
- **Our Actions:** Details the community's resilience vision and projects identified, including **catalyst projects** with high impact, that have lower barriers to implementation and that have secured or anticipated funding. These catalyst projects will be implemented first to demonstrate success and build momentum for broader climate action initiatives.

INTRODUCTION

About Resilience for Communities

In rapidly growing cities across Asia, climate change, social inequality and unplanned urbanization overlap and intensify. In coastal cities like Melaka, extreme heat, flooding and rising sea levels threaten lives, livelihoods and local heritage, putting years of development progress at risk. But the impact is not felt equally. Aging adults and lower-income neighborhoods often carry the heaviest burden.

These challenges can undo significant development gains unless addressed through equitable, community-focused resilience approaches. So, building resilience in this context means going beyond infrastructure or emergency response – it requires investing in community resilience. Long-lasting change starts by listening to communities and working alongside them to shape solutions rooted in their lived realities.

The Urban Climate Resilience Program is funded by the Z Zurich Foundation and implemented in nine countries. It aims to build sustainable and resilient communities that can withstand, recover from and thrive in the face of climate-related disasters. The program is a collaboration between the Z Zurich Foundation, Zurich Insurance National Business Units, and the following organizations: Resilient Cities Network, C40 Cities, the International Federation of Red Cross and Red Crescent Societies (IFRC), Local Governments for Sustainability (ICLEI) and Plan International.

Within the Resilient Cities Network, the Urban Climate Resilience Program is referred to as Resilience for Communities, or R4C. The R4C program includes the four R-Cities member cities: Boston, Houston, Greater Manchester, and Melaka. R4C blends place-based and community-centered approaches with R-Cities' urban resilience framework, connecting local initiatives to city systems while bridging stakeholder gaps to enhance urban resilience.

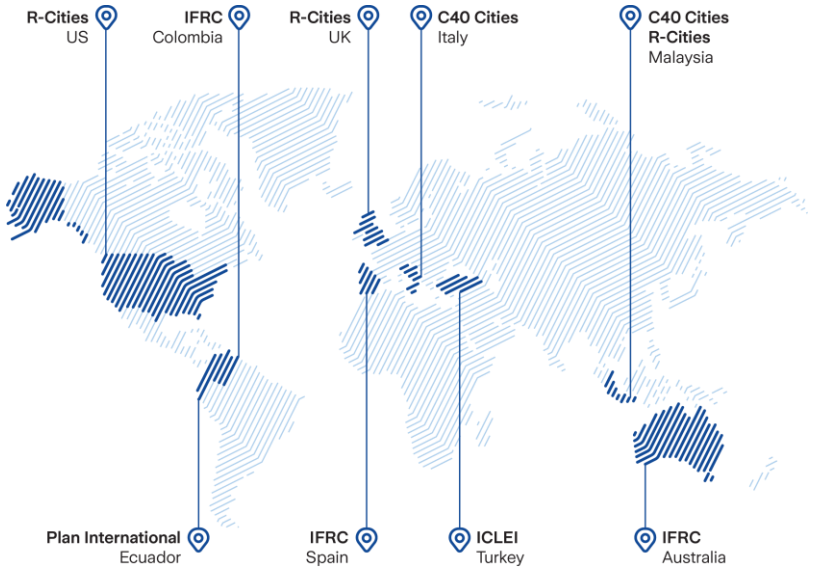

FIGURE 1: Map displaying the five implementing organizations in the Urban Climate Resilience Program and their respective program countries

FIGURE 2: Map of R4C cities

R4C in Melaka, Malaysia

Melaka faces several interconnected challenges, including frequent flooding, an aging drainage system, traffic congestion, gentrification, and inadequate infrastructure maintenance. These issues threaten the city's status as a UNESCO World Heritage Site, the well-being of residents and its cultural identity, particularly in the face of increasing climate risks.

Melaka Historic City Council's vision is to create a sustainable, smart, and thriving heritage city. Through its 2019 City Resilience Strategy, Melaka targets three main pillars:

1. Thriving and engaged communities
2. A livable and efficiently connected city
3. Collective leadership with smart governance.

These pillars recognize the interconnectedness of social, environmental and economic factors and propose integrated solutions to safeguard Melaka's future.

In Melaka, following a selection process, the R4C program engages the communities in Kampung Morten and Pantai Peringgit. These communities are exposed to flooding and heat risks, but they are committed to collaborating to address these challenges. The R4C program co-designs and implements projects to improve resilience to floods and excessive heat, aiming to accelerate climate resilience and promote sustainable development.

The city has prioritized a resilience-focused approach that supports inclusive decision-making, promotes multisector collaboration and invests in sustainable, adaptive development. This approach aims to protect Melaka's heritage, support vulnerable communities and ensure long-term economic and social prosperity amid climate change. The R4C program and its principles align well with the MBMB's ambitions and address the challenges they are facing, making it an ideal fit for the city's resilience journey.

FIGURE 3: Resilient Melaka Strategy's Three Main Pillars
Source: Resilient Melaka (Majlis Bandaraya Melaka Bersejarah, 2019)

R4C Implementation in Melaka

The R4C program in Melaka is jointly implemented by R-Cities and the Melaka Historic City Council Resilience Unit. It is supported by the Z Zurich Foundation and Zurich Malaysia. R-Cities also engages partners such as Urban Scale Studio and the Asian School of the Environment at Nanyang Technological University (Singapore) to bring in local knowledge and strengthen technical expertise.

For the R4C program, engagement with the community of Pantai Peringgit is facilitated through its existing residential committees. Each community in Melaka has a Development and Coordination Committee (JPKK) that manages state-supported community development programs.

As the program moves forward to project implementation, R4C aims to expand its partnerships and enhance stakeholder engagement, fostering a stronger enabling environment for community and climate actions.

R4C Melaka Champions

The Department of Town Planning in MBMB oversees urban planning and includes the Resilience Unit. The head of the department also serves as the Chief Resilience Officer of Melaka. The Resilience Unit's primary purpose is to integrate resilience principles into the city's planning and development, ensuring that Melaka can adapt to and thrive amid future challenges.

To implement R4C in Melaka, a task force coordinated by the Chief Resilience Officer and consisting of 21 relevant MBMB officials was formed. These R4C Champions participate in various activities, such as workshops and engagement sessions.

LIST OF RELATED DEPARTMENTS AS R4C CHAMPIONS MEMBER:

1. Department of Evaluation and Asset Management
2. Department of Engineering
3. Department of Corporate and Community Management
4. Department of Licensing and Environmental Health
5. Department of Landscape and City Beautification
6. Department of Town Planning

R4C Objectives

The Resilience for Communities program provides Melaka with comprehensive support to build climate resilience at the community level.

The objectives of R4C are to:

1. Invest in and deepen the resilience capacity of cities by providing diagnostic support, including through the CRMC tool
2. Understand barriers to achieving urban resilience through direct communication with the communities most affected
3. Co-design equitable, resilience-focused interventions by engaging and working directly with community members and city leaders
4. Kick-start initial projects through catalyst funding (Resilient Community Impact Funds) and leverage additional climate action investments
5. Create a project pipeline that serves as both an implementation roadmap and a strategic tool for partnership development and advocacy

Installation of Outdoor Heat Sensor
Source: Majlis Bandaraya Melaka Bersejarah, 2025

Phases of Implementation

The R4C program follows a three-step process in each of the identified communities.

PHASE 1

RESEARCH AND ASSESSMENT

Direct involvement of communities in identifying gaps and obstacles to address their unique challenges using tested methodology, including the CRMC tool

PHASE 2

CO-PRODUCING ACTIONS AND PLANS

Engagement with community, city and other stakeholders in the project preparation process; mapping of partnership opportunities

PHASE 3

DESIGN & IMPLEMENTATION

Identification and implementation of interventions to enhance community resilience to climate hazards; recommendation of policies to be developed for further up-scaling.

Resilient Community Impact Funds

This CAP document includes the identification of catalyst projects to be funded during Phase 3, including under the R4C's Resilient Community Impact Funds, designed to kick-start further climate actions in Pantai Peringgit.

Community Engagement in Pantai Peringgit
Source: Urban SCALE, 2025

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OUR CITY

Melaka Overview

About Melaka City

Melaka City is the capital of Melaka State, located on the west coast of Peninsular Malaysia with a population of about half a million people. Known for its rich history and multicultural heritage, the city is a UNESCO World Heritage Site recognized for its well-preserved colonial architecture and historical landmarks. Once a vital port during the 15th century, Melaka has evolved into an urban center that balances cultural preservation with modern development. The city relies heavily on its UNESCO World Heritage Site status for economic stability, with 45 percent of its income from the services and tourism sectors. However, this dependence creates vulnerabilities, as demonstrated during the COVID-19 pandemic, which severely disrupted economic and tourism activities. The city also faces ongoing flooding challenges due to an aging drainage system, with flash floods occurring regularly during periods of heavy rainfall, particularly affecting low-lying areas and heritage zones.

Melaka Historic City Council and Melaka State

Melaka City is administered by Majlis Bandaraya Melaka Bersejarah (also known in English as Melaka Historic City Council), which handles public health, town planning, environmental protection, and urban-infrastructure maintenance. At the state level, Melaka is governed through the State Legislative Assembly comprising elected representatives known as Ahli Dewan Undangan Negeri .

The ADUNs are collectively led by the Chief Minister of Melaka, who oversees the implementation of state policies and strategic development initiatives. Each ADUN represents their constituency and plays key roles in legislation, constituency service, development planning and community engagement, acting as a bridge between government and residents. State agencies, such as the Department of Drainage and Irrigation, operate under state jurisdiction to manage water infrastructure and flood mitigation.

Together, the Chief Minister, the ADUNs and local authorities such as the MBMB work in coordination to address Melaka's development needs while managing the challenges of heritage preservation, economic resilience and climate adaptation.

Melaka State
Is a state located in the south of Peninsular Malaysia; it borders Negeri Sembilan and Johor

Melaka Historic City Council
The selected communities (Kampung Morten and Pantai Peringgit) are under the jurisdiction of Majlis Bandaraya Melaka Bersejarah

FIGURE 4: Map of states in Peninsular Malaysia

Melaka Priorities

As the local authority, the MBMB's mission is to promote a livable heritage city through efficient and responsive urban governance for the well-being of all residents, with climate resilience as a top priority. To address flooding challenges, the MBMB has planned 30 flood mitigation projects, including 16 in the Melaka City Parliamentary Areas such as Kampung Morten and Pantai Peringgit, 10 in Tangga Batu, and four in Hang Tuah Jaya. These projects include the construction and upgrading of 26 drainage systems and two reservoirs, along with two installations of flood pumps and water gates.

To reduce carbon dioxide emissions and help lower global temperatures , the MBMB is also implementing an energy-saving initiative. This involves installing and replacing 253 smart LED streetlights, as well as upgrading 294 existing high-mast, spot and pedestrian lights to LEDs within 2025. The MBMB has set out a policy to install 300 smart LED streetlights annually, which can reduce electricity consumption by 60-80 percent. Additionally, all MBMB infrastructure and building projects now use LED lighting. Solar panels are also being installed at every bus stop and on the MBMB office building.

Flood Risk in Melaka

In Melaka, there are eight major river basins, including the Sungai Melaka basin, which runs through the city center and R4C locations like Kampung Morten and Pantai Peringgit. In 2023, the Global Risk Resilience Fellowship program, a collaboration between Resilient Cities Network and Howden Insurance, conducted a desktop flood hazard analysis in Melaka, focusing on the UNESCO World Heritage Site and three kampungs, including Kampung Morten.

The analysis identified three main causes of flooding in Melaka:

1. Flash floods from heavy rainfall
2. River floods from overflowing riverbanks during heavy rain or high tides
3. (Less common) storm surges caused by strong winds pushing seawater onto the coast.

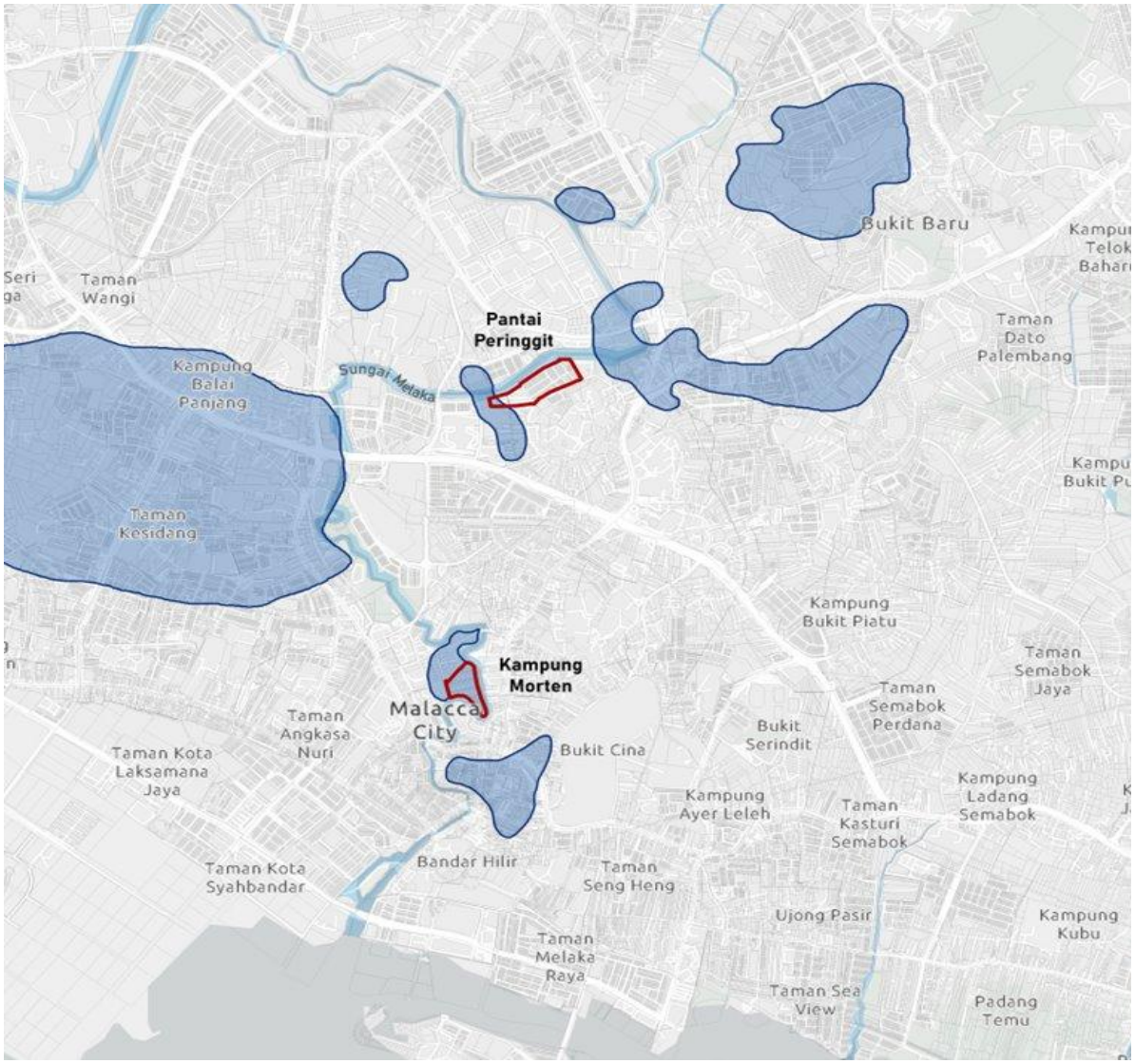
Recent Flood Events in Melaka

The *Jabatan Pengaliran dan Saliran (JPS)*, under Malaysia's Ministry of Energy Transition and Water Transformation (PETRA), categorizes floods into four types:

1. Monsoon floods
2. Flash floods
3. Coastal floods
4. Stagnant floods.

According to the JPS' 2022 Annual Flooding Report, Melaka experienced 39 flash flood events that year.

The Sungai Melaka basin is prone to floods, especially during the Northeast Monsoon from November to March. A significant flood event occurred on 6 May 2022, affecting areas in the Sungai Melaka basin such as Solok Benteng, Sungai Putat, Taman Bukit Beruang, Jalan Pulau Nibong and Pengkalan Rama Pantai. The Batu Hampar telemetry station recorded an unprecedented 174 mm of rainfall in just two hours, exceeding a 100-year return period. Flood depths ranged from 0.2 to 0.45 meters, highlighting the event's severity.



Legend

Flood Prone Area | Melaka River | Land Cover | Road

FIGURE 5: Melaka flood map
Source: Interim Report, Integrated River Basin Management Plan, Sungai Melaka, 2024

Flood-Prone Areas in Melaka

Flood-prone areas, as defined by JPS, are zones highly susceptible to flooding due to factors such as intense rainfall, river overflow and rapid urbanization.

As the country's lead agency on flood risk management, the JPS identifies vulnerable areas, develops mitigation strategies and implements early-warning systems to reduce impacts on communities.

According to the 2024 Integrated River Basin Management Plan for Sungai Melaka by the JPS, Rumah Pangsa and Rumah Awam Pantai Peringgit are not officially designated as flood-prone areas.

However, insights from community engagement reveal that Rumah Awam Pantai Peringgit experiences flooding annually, indicating recurring on-the-ground flood risks. While Rumah Pangsa itself remains unaffected, the surrounding areas are prone to inundation during heavy rainfall events.

Heat Risk in Melaka

In Malaysia, policy and public attention have primarily focused on acute heatwaves rather than chronic heat stress. The MET Malaysia classifies classifies and monitors heatwave events, issuing alerts when temperature thresholds are exceeded. In March 2024, Melaka experienced a Level 1 Heat Alert when temperatures consistently reached 35-37°C for three consecutive days.

Heatwave Categories

LEVEL	DAILY MAXIMUM AMBIENT TEMPERATURE
Level 1: Alert Level	**Level 1:** 35°C to 37°C for at least three consecutive days
Level 2: Heatwave	**Level 2:** 37°C to 40°C for at least three consecutive days
Level 3: Extreme Heatwave	**Level 3:** Exceeds 40°C for at least three consecutive days

To enhance local understanding on heat stress, Melaka City has partnered with the Asian School of the Environment at Nanyang Technological University in the framework of the R4C program to conduct citywide heat mapping. Derived using the wet-bulb temperature index – which accounts for both heat and humidity – the meteorological data show frequent exceeding of the 27°C discomfort threshold, especially during the April-May 2023 heatwave.

Wet-bulb temperature is particularly relevant in humid, tropical environments like Melaka, where high humidity reduces the body's ability to cool itself through sweat evaporation.

Urban heat island analysis also revealed that areas with very high urban heat intensity had less tree coverage (see Figure 6). This includes the heritage zone in the city center, which had less than 10 percent tree coverage (see figure 7). These insights provide a valuable basis for guiding climate-responsive urban planning and greening strategies.

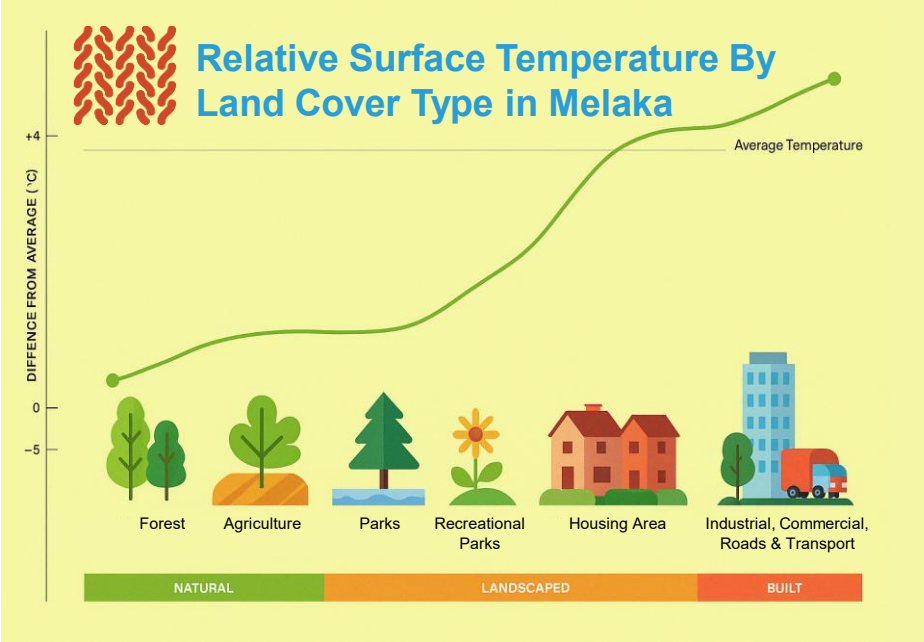


FIGURE 6: Melaka's relative surface temperature by land cover Source: Ramsay and Hamel, "Rapid Heat Assessment: Melaka, Malaysia" (Nanyang Technological University, 2025)

Urban Heat Islands in Melaka

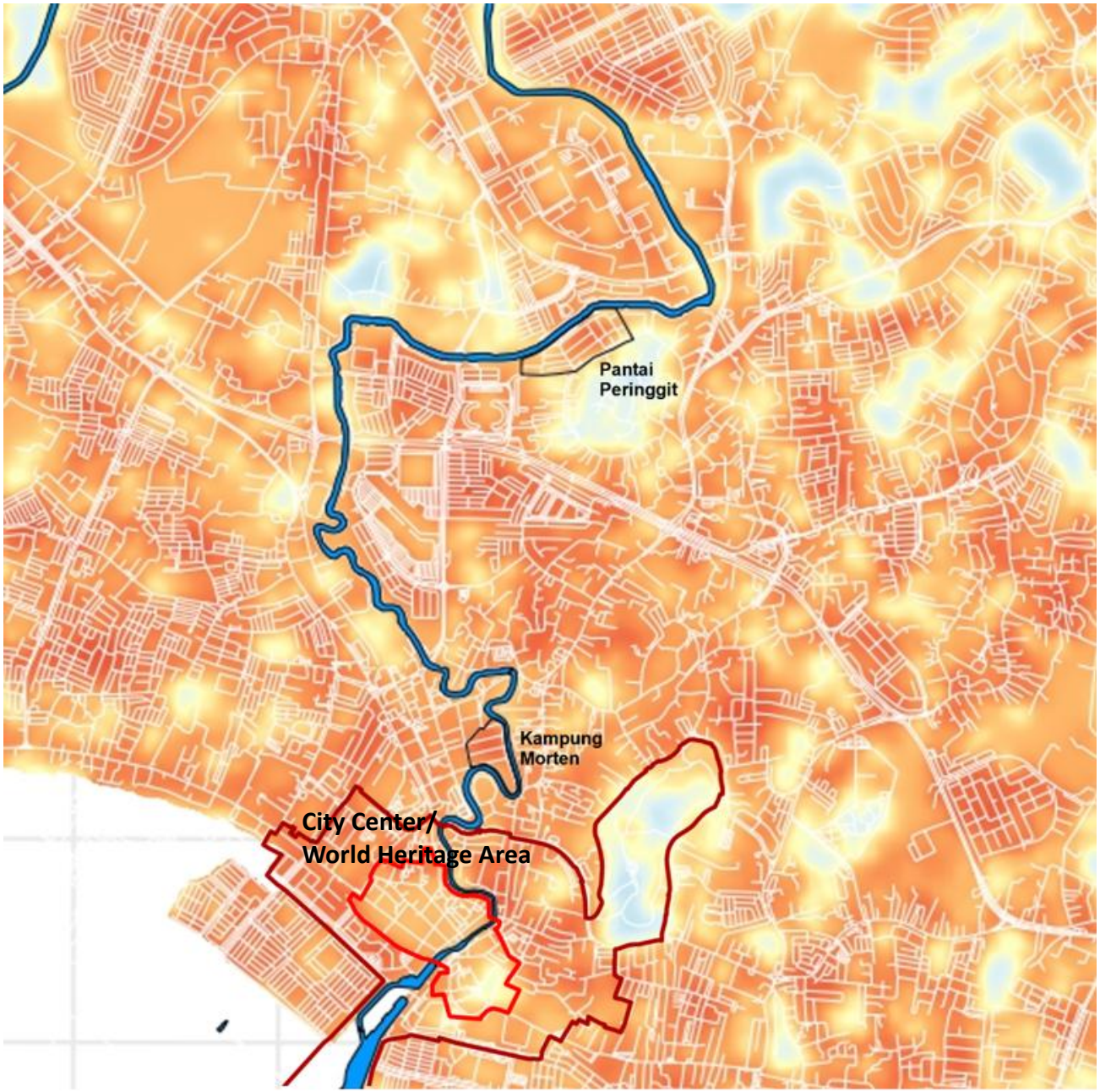


FIGURE 7: Melaka's urban heat island map –Integrated Valuation of Ecosystem Services and Trade-offs Modelling Source: Ramsay and Hamel, "Rapid Heat Assessment: Melaka, Malaysia" (Nanyang Technological University, 2024)

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Tetap sejuk untuk semua

OUR COMMUNITY

Pantai Peringgit

About the community

Pantai Peringgit is located on the outskirts of the city center, alongside the Melaka river and next to the Melaka Sentral Bus Terminal. It comprises two sub-communities: Rumah Pangsa Pantai Peringgit (living in apartments) and Rumah Awam Pantai Peringgit (landed housing). Rumah Awam Pantai Peringgit refers to the landed government housing scheme developed in the 1970s, initially designated for civil servants. Rumah Pangsa Pantai Peringgit on the other hand, refers to high-rise, low-cost apartments developed in phases starting in 1993, catering to low income residents of Negeri Melaka. These communities are striving to rejuvenate an area that was previously notorious for high crime rates. Rumah Awam Peringgit, with its 1,000 residents, frequently faces flooding, but residents are proactive in protecting their homes and surroundings. However, flood-prone areas often become breeding grounds for dengue mosquitoes, and floodwaters damage recreation facilities along the river, limiting community access. In the apartments of Pantai Peringgit, which house 2,160 residents, reduced airflow leads to higher indoor temperatures, and most low-income households lack air conditioning.

The Climate Resilience Measurement for Communities assessment was conducted separately for each of the two sub-communities to better capture their distinct challenges and needs. The findings are presented individually.

In Rumah Awam Pantai Peringgit, residents continue to face frequent flooding. Repeated engagements by different organizations have led to “assessment fatigue”, resulting in low participation during this process. The community also shows signs of low social cohesion, which may further affect collective resilience. Given the persistence and severity of flooding, this will be the primary focus for action planning in the area – while also considering approaches that rebuild trust and avoid overburdening the community.

In Rumah Pangsa Pantai Peringgit the lowest-income community compared to neighboring Rumah Awam Pangsa Peringgit as well as Kampung Morten heat emerged as a major concern. Many residents cannot afford cooling solutions such as fans or air conditioning, leaving them especially exposed during extreme heat events. Action planning for this community will focus on heat mitigation and ways to improve thermal comfort.

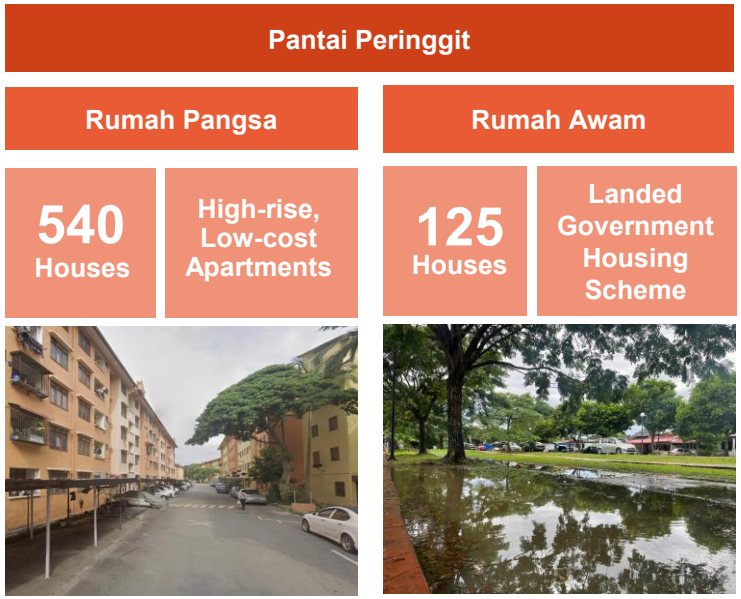


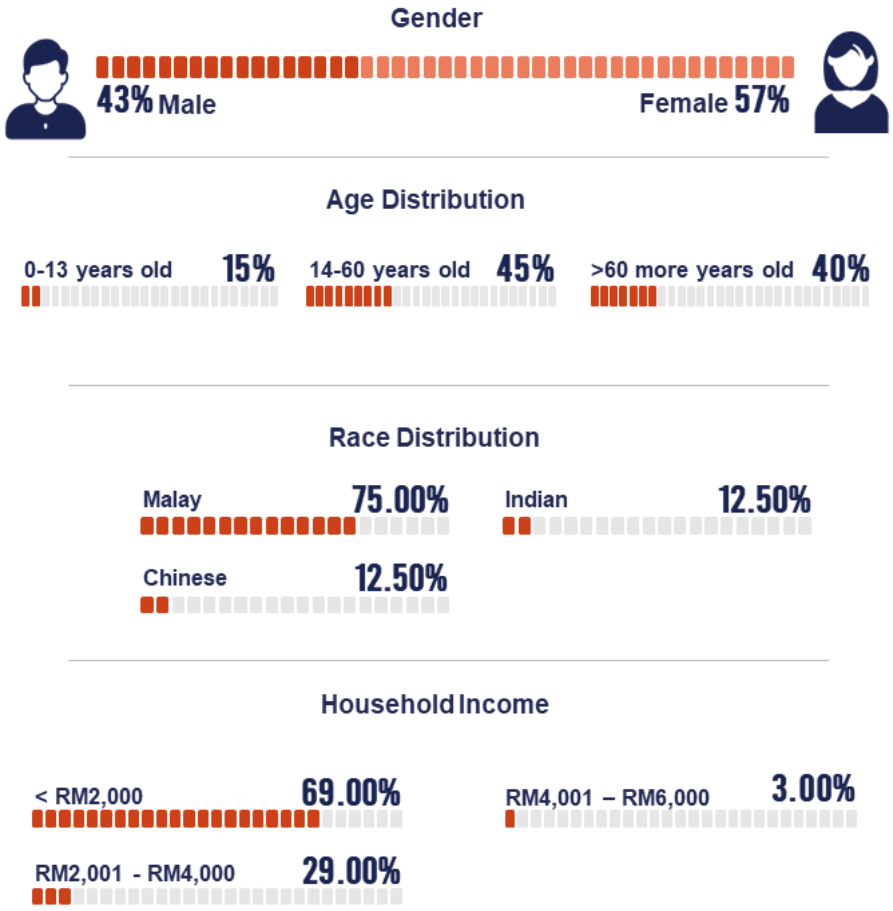
FIGURE 8: Rumah Pangsa Pantai Peringgit
Source: Urban Scale, 2024

FIGURE 9: Rumah Awam Pantai Peringgit
Source: Urban Scale, 2024

Demographic Profile

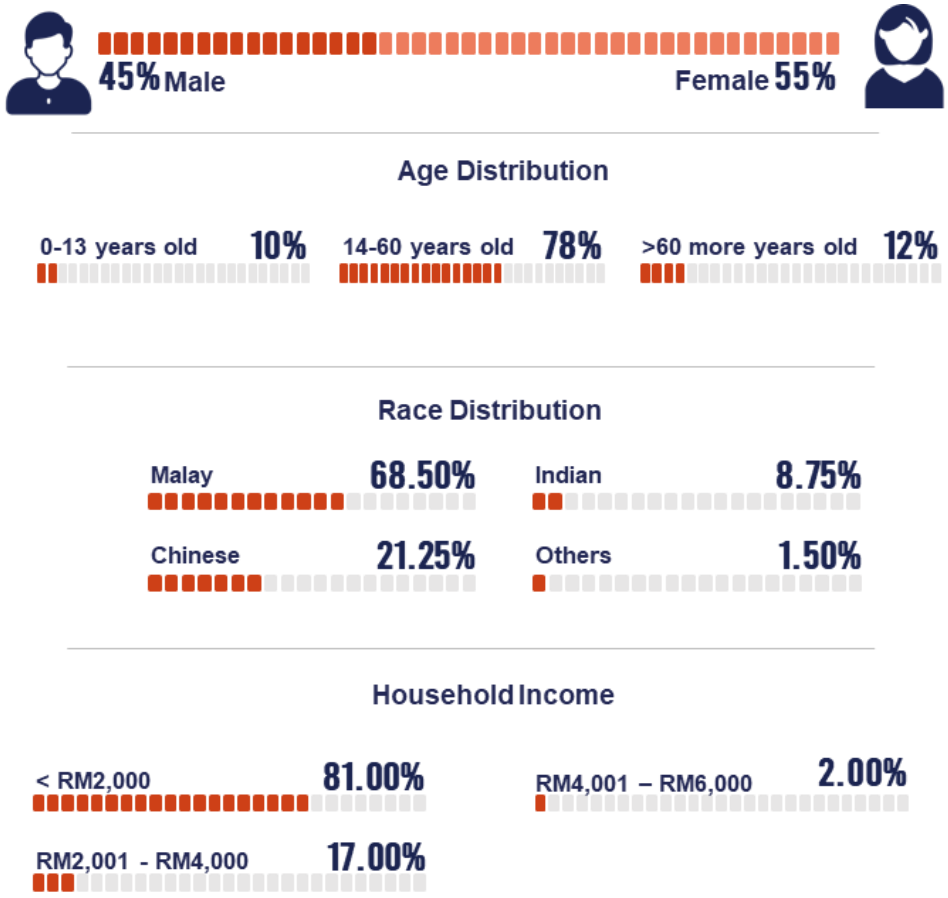
Demographic Profile in Rumah Awam Pantai Peringgit

A summary of this profile in Rumah Awam Pantai Peringgit is presented in the figure below, while a more detailed demographic and socioeconomic analysis. The total population of Rumah Awam Pantai Peringgit Pantai Peringgit are 1,000 people with average household size approximately is 6 to 8 people.



Demographic Profile in Rumah Awam Pantai Peringgit

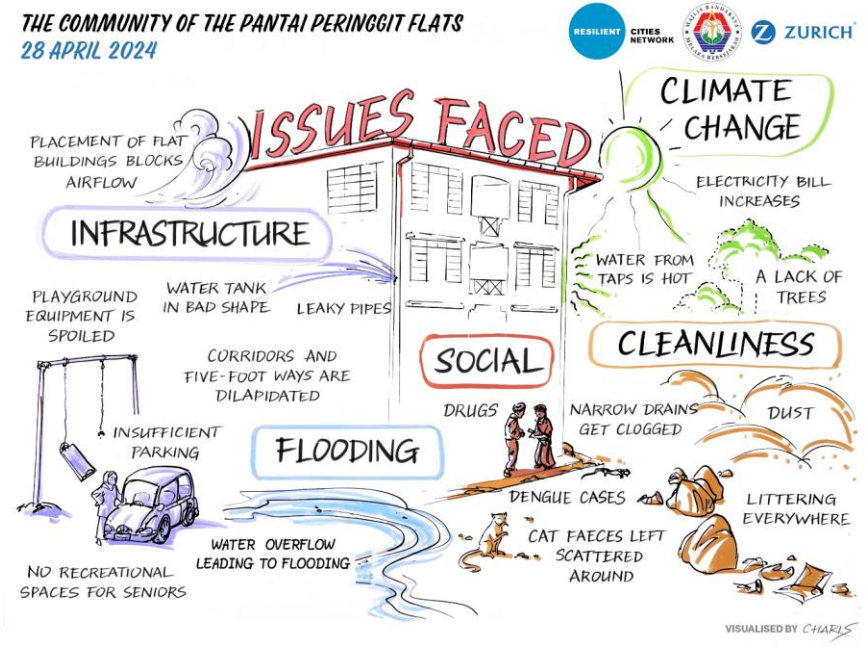
A summary of this profile in Rumah Pangsa Pantai Peringgit is presented in the figure below, while a more detailed demographic and socioeconomic analysis. The total population of Rumah Awam Pantai Peringgit Pantai Peringgit are 2,160 people with average household size approximately is 4 people.



*In 2022, the average Poverty Line Income (PLI) in Melaka was RM2,670 per month, while the average food PLI stood at RM1,244 per month - Department of Statistics Malaysia (DOSM)

Shocks and Stresses

Both Rumah Pangsa Pantai Peringgit and Rumah Awam Pantai Peringgit faces multiple shocks and stresses, including flooding and heat, compounded by their financial constraints and the pressures associated with their safety images.



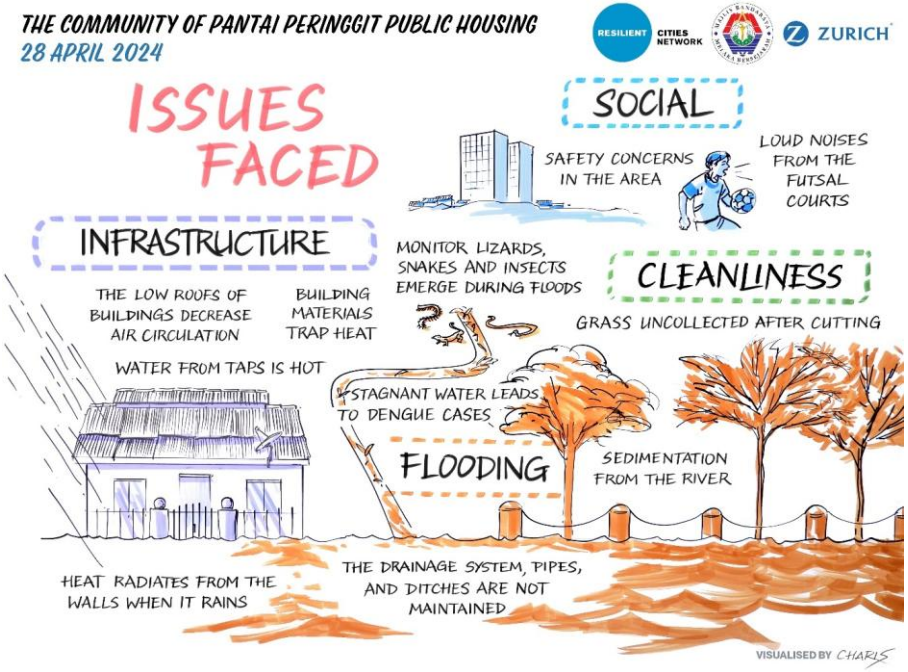


FIGURE 10: Pantai Peringgit Issues Mapping from Engagement Sessions, 2024

Flooding

Early engagement with community leaders and focus group discussions led to the development of a community flood map in collaboration with R-Cities, the Urban Scale Studio and the MBMB (Figure 11). This map shows that flooding incidents are primarily caused by river overflows and clogged drainage systems.

Rumah Pangsa residents experience minimal flood impacts despite being close to the river. Historical data from 2019 to 2023 and focus group discussions confirm that flooding is not a major concern. Although the flooding has not directly impacted Rumah Pangsa, it has had a minor effect on the block adjacent to the river, where water from toilet drainage overflows during flood events. Residents are more concerned with social challenges and cleanliness.

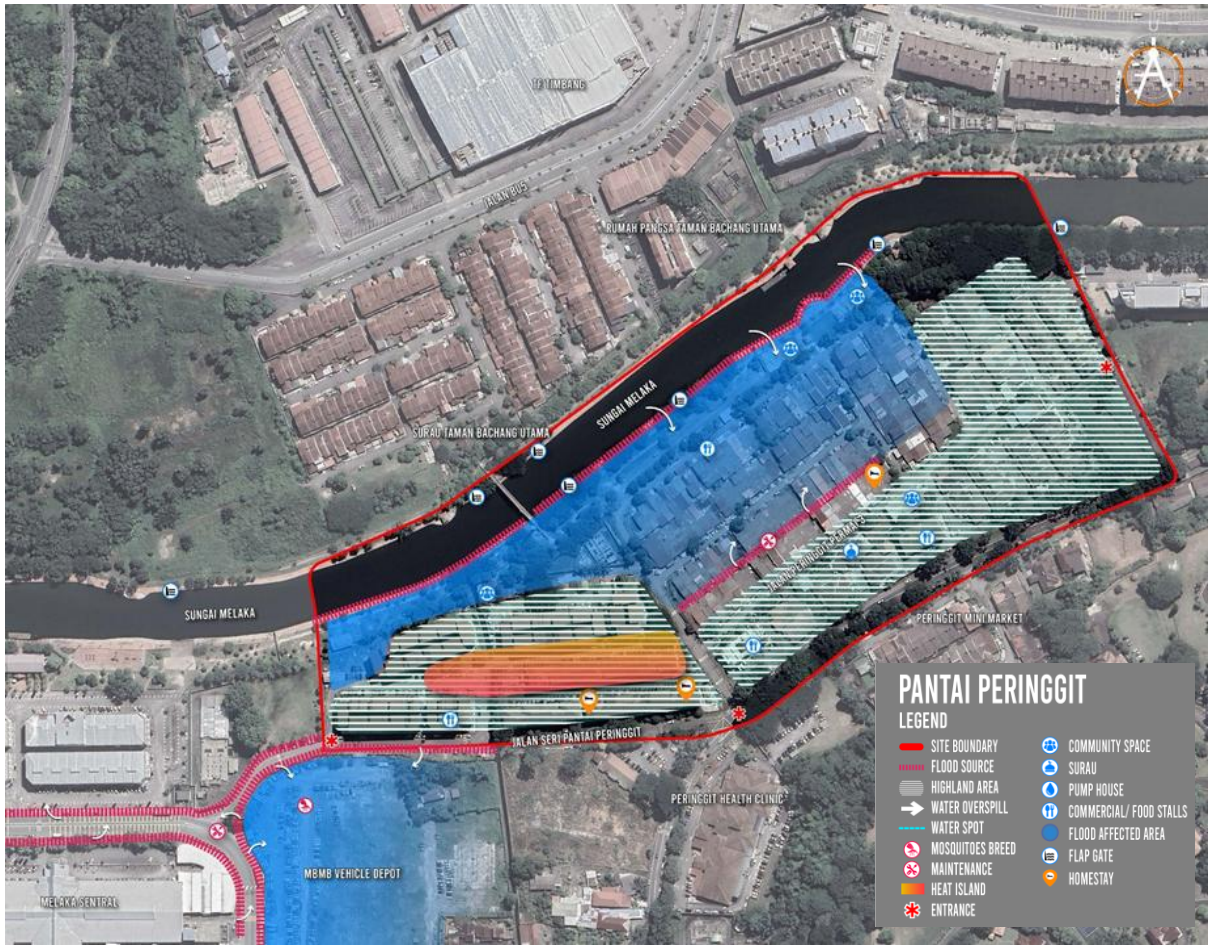


FIGURE 11: Pantai Peringgit Community Mapping, 2024

Flooding is a more significant issue for Rumah Awam, particularly for those living closest to the river. While there is green space providing distance to the river, it is sloped, and the houses are lower than the water level of the river, so there is no drainage. Flood events have required evacuations as recently as January 2022, and residents have had to replace damaged belongings.

Annual monsoon floods often lead to property damage, and severe events such as in January 2022 have required evacuations. The community identified clogged drains and river overflows as primary causes of flooding. Collaborative flood mapping efforts have highlighted the urgent need for improved drainage and protective measures for the most vulnerable areas.

FIGURE 12: Flooding from January 2022
Source: Kosmo Online, 2022

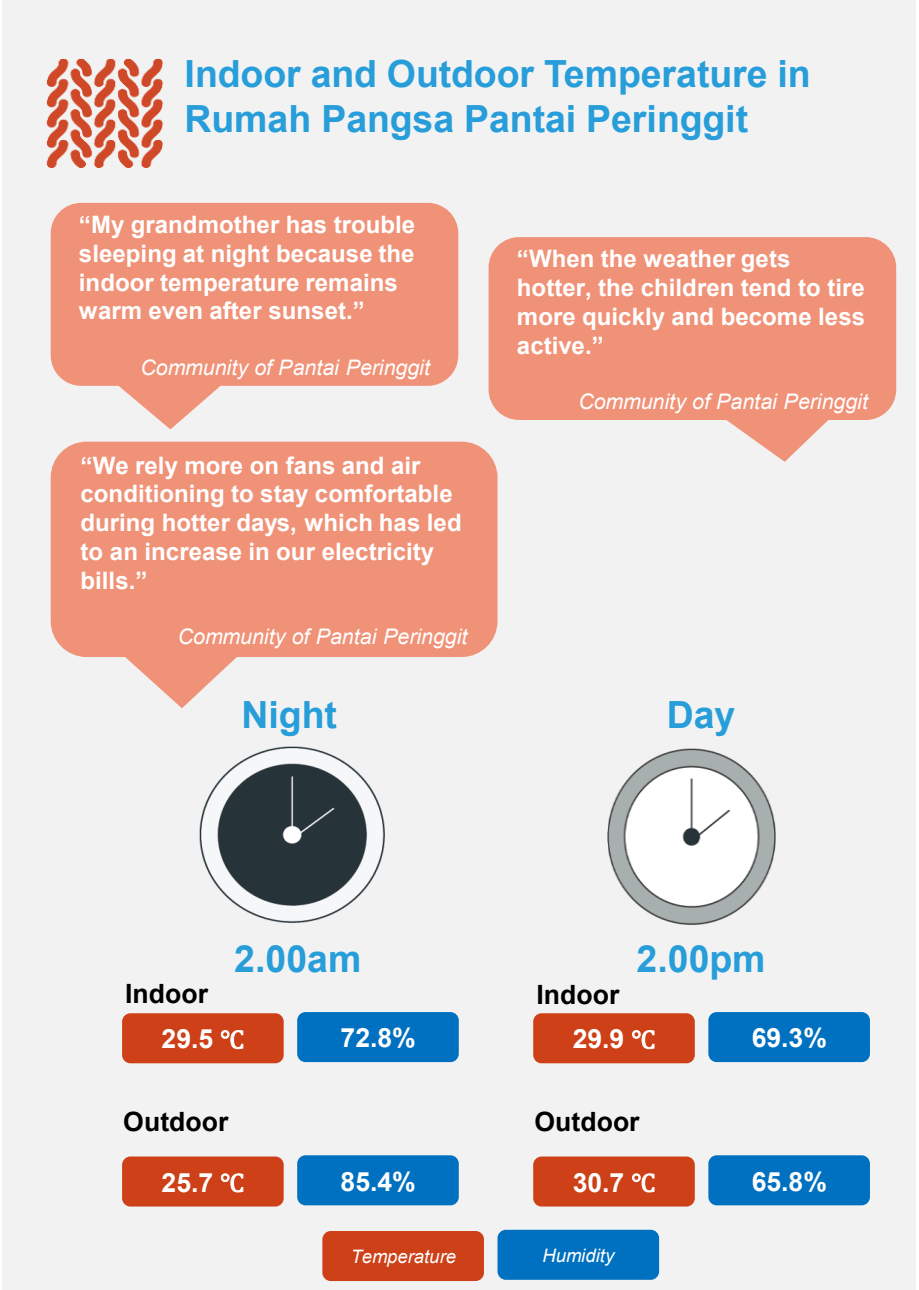
FIGURE 13: More recent flooding events from 2024 and March 2025
Source: Community of Rumah Awam Pantai Peringgit, 2024 and 2025

Heat

Heat has become an increasingly important issue in Pantai Peringgit. A city-wide urban heat assessment by Nanyang Technological University identified the area as having slightly lower temperatures than city center, thanks likely to its relatively high vegetation cover. However, the follow-up community heat assessment also showed that microclimate variations exist within the area. Indoor sensors were installed in October 2024 in 17 homes within Rumah. The objective is to better understand local indoor-climate conditions and support evidence-based planning.

Preliminary data collected up to February 2025 for Rumah Pangsa Pantai Peringgit show that indoor temperatures remain relatively constant between 2:00 p.m. and 2:00 a.m., averaging between 29.5°C and 29.9°C and with humidity levels ranging from 69.3 percent to 72.8 percent. This indicates persistent indoor warmth, which may lead to thermal discomfort for residents, especially during the night. In comparison, outdoor temperatures fluctuate more significantly, peaking at 30.7°C in the afternoon and dropping to 25.7°C late at night.

These findings reinforce the importance of using local climate data to inform planning, design and retrofitting strategies, particularly for improving thermal comfort in residential areas. Pantai Peringgit's involvement in this initiative reflects a strong commitment to community-driven resilience, ensuring that future solutions are locally grounded and responsive to real urban heat challenges.



Climate Resilience Measurement for Communities

In Melaka, the assessment stage is built on the Climate Resilience Measurement for Communities tool from the Z Zurich Foundation. The CRMC model looks at factors contributing to a community's resilience through a holistic lens using the five-capitals model of assets that make up a community: human, social, physical, natural and financial (figure 14).

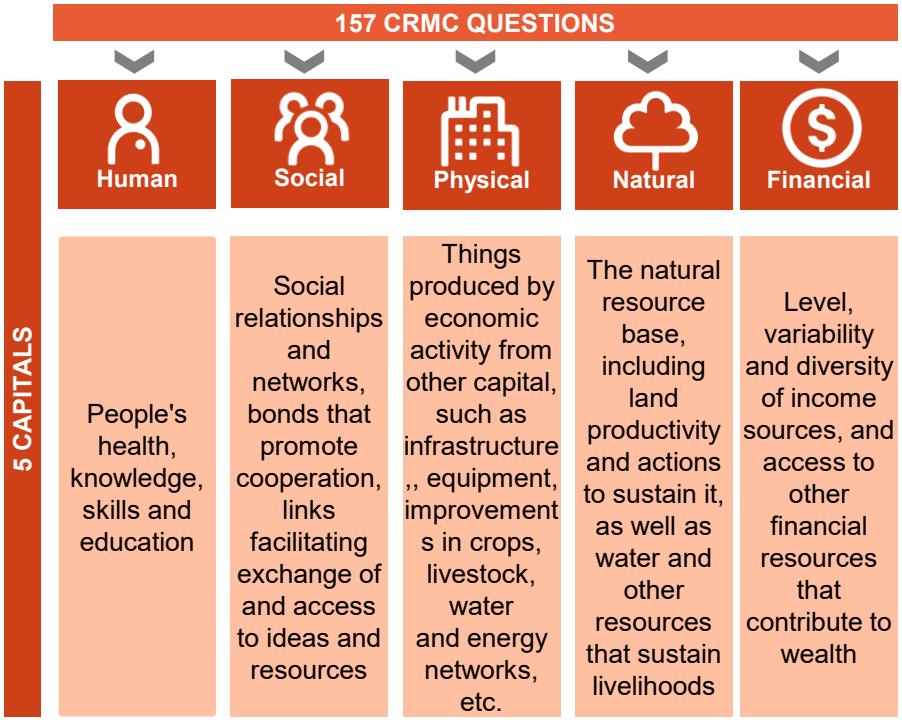


FIGURE 14: CRMC Five Capitals

The CRMC also looks at hazards, in the case of Melaka, both flooding and heat. For hazards, sources of resilience are also grouped into three categories: general, hazard-specific, and hazard-unique.

To that end, CRMC has identified 76 sources of resilience through 157 questions associated with the hazards and the five capitals. The questions are also grouped into seven different themes, shown in figure 15. Information on basic demographics is also collected to obtain a better understanding of the community.

FIGURE 15: CRMC Seven Themes

The CRMC uses software that feeds the data collected in the field through a mobile application on a smartphone/tablet to an online web platform for setup and analysis. The data collection process itself is structured around four key modes: **secondary research, key-informant interviews, focus groups and household surveys.**

Series of Community Engagement

Phases 1 and 2 of the Resilience for Communities initiative involved extensive community engagement through surveys, focus group discussions and interviews carried out in accordance to the Climate Resilience Measurement for Communities tool. These participatory processes were critical in shaping this Community Action Plan, ensuring it reflects real challenges on the ground while amplifying local voices in decision making.

By adopting a co-design approach, the initiative fostered collaboration between communities and agencies, enabling solutions to be developed together rather than imposed. This helped address implementation barriers, align agency efforts with community needs and build mutual trust. Beyond data collection, the process laid a strong foundation for shared ownership and long-term resilience, ensuring no-one is left behind as Melaka adapts to future urban and climate challenges.

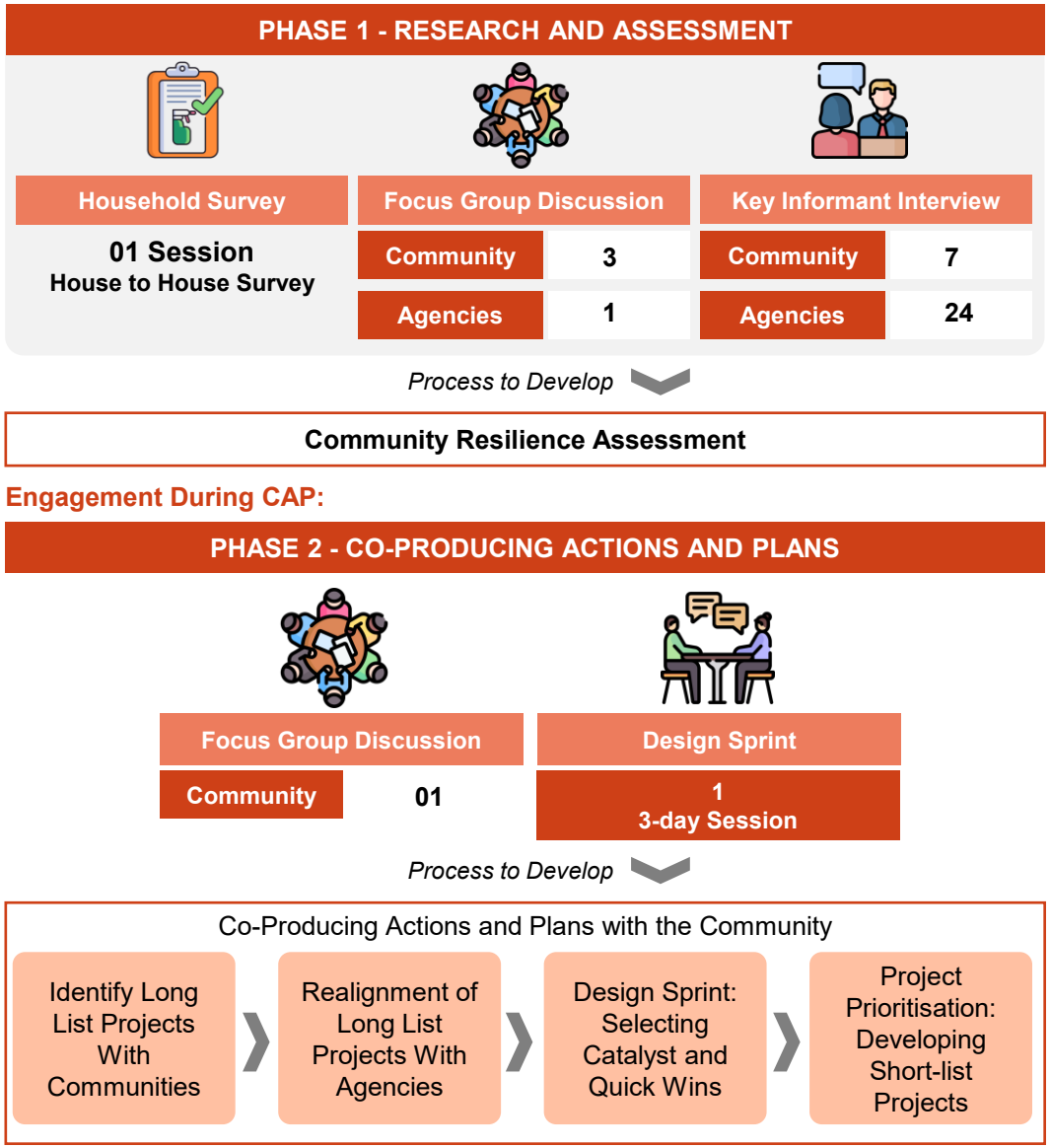


Figure 16: Engagement During Assessment Process

Summary Findings for Flood and Heat Assessment in Rumah Pangsa Pantai Peringgit

Although situated near the river, Rumah Pangsa Pantai Peringgit sees minimal flooding. Official data and community discussions confirm that flooding seldom impacts residents, except for occasional toilet overflows in one block during flooding season. Instead, people here grapple more with social and cleanliness issues. Concerns include safety, drug-related activity and littering, while limited airflow in the high-rise setting contributes to high indoor temperatures. Heat is a growing challenge, as confirmed by city-wide assessments showing elevated annual average daily maximum temperatures, second only to Kampung Morten.

Human

+ Strengths

Better awareness on protecting from heat

– Weaknesses

Food insecurity

Limited awareness on climate change

Social

+ Strengths

Good healthcare accessibility and trust in local leadership

– Weaknesses

Lack of community-level risk mapping, risk reduction and risk response, particularly for heat

Physical

+ Strengths

Infrastructure and measures in place for flooding

– Weaknesses

Less readiness for heat, such as availability of water during dry season

Natural

+ Strengths

Green surrounding areas and many trees

– Weaknesses

Within the complex itself, very limited tree cover and extensive non-permeable surfaces

Financial

+ Strengths

Being public housing, some access to public infrastructure maintenance budget

– Weaknesses

Huge financial constraints, including for example with energy affordability

Summary Findings for Flood and Heat Assessment in Rumah Awam Pantai Peringgit

Frequent flooding – January 2022 being a notable example – requires evacuations and imposes long recovery times. Although the area's abundant trees offer potential for nature-based solutions, challenges such as inadequate drainage, low-lying terrain and sedimentation in waterways continue to expose residents to flood hazards. In addition, while community awareness of flood-prone areas is relatively strong, planning for both flood and heat risks is underdeveloped, and limited financial resources (including a lack of insurance coverage) heighten vulnerability. In terms of community safety, the neighborhoods contend with a negative reputation linked to drugs and security concerns. Important to note that in Rumah Awam Pantai Peringgit, the response rate during the survey and engagement was lower than the required target, which means these findings should be interpreted cautiously.

Human

+ Strengths

High awareness of flood risk and first aid knowledge

– Weaknesses

Food insecurity and limited worker protection for heatwaves

Social

+ Strengths

Good healthcare accessibility

– Weaknesses

Limited inclusivity of

Disaster Risk Management DRM

Lack of community-level risk mapping, risk reduction and risk response

Physical

+ Strengths

Good communication and continuity of healthcare during disaster

Confidence in household adaptability

– Weaknesses

Limited early-warning system

Natural

+ Strengths

Extensive green areas and many tress

– Weaknesses

Limited and non-extensive non-permeable surfaces

Financial

+ Strengths

While heat is also a concern, energy affordability is not an issue (more houses with air conditioning)

– Weaknesses

Limited community savings

Why We Need To Take Action

What has the community experienced?

Community engagement with residents of Rumah Pangsa and Rumah Awam Pantai Peringgit revealed that both communities are affected by heatwaves. Despite the severity of this issue, many residents have limited knowledge of effective strategies to mitigate heat impacts in their homes and daily lives. Additionally, while Rumah Awam faces recurring flooding at least once per year particularly during the monsoon season from October to December – Rumah Pangsa is not affected by flooding.

"We shower more frequently during a hot day. We are not able to afford to install air conditioning."

Community of Rumah Pangsa Pantai Peringgit

"The flood worried us as a community."

Community of Rumah Awam Pantai Peringgit

"We need to use fans carefully, as electricity bills can become expensive."

Community of Rumah Pangsa Pantai Peringgit

Community Engagement with Community Rumah Pangsa Pantai Peringgit
Source: Majlis Bandaraya Melaka Bersejarah, 2025

Summary of Community Aspirations for Rumah Pangsa Pantai Peringgit

During engagement sessions, community members of Rumah Pangsa Pantai Peringgit cited their aspirations for a cleaner, safer and greener living environment. Residents envisioned well-maintained infrastructure, a vibrant community garden and more greenery to enhance the microclimate and aesthetics of the area. Recreational spaces for seniors, an enjoyable playground and a beautiful prayer area or mosque are seen as vital for fostering community interaction and cultural identity. Safety is a priority, with aspirations for a crime-free environment supported such as by the installation of security cameras.

FIGURE 17: Community Aspiration from Engagement Sessions for Rumah Pangsa Pantai Peringgit , 2024

Summary of Community Aspirations for Rumah Awam Pantai Peringgit

The community members of Rumah Awam aspire to a safe, resilient and engaging environment. Residents wish to see the roads repaired, roof ventilators installed to address indoor heat, and community programs put in place to enhance social cohesion. Priorities include developing areas free from flooding and transforming the river into an asset associated with pristine beauty. Recreational opportunities such as playing fields for football and improved public safety measures, including security cameras along riverbanks, are also key aspects of the vision. These aspirations reflect the community's desire for a harmonious balance between infrastructure upgrades, environmental preservation and social well-being.

FIGURE 18: Community Aspiration from Engagement Sessions for Rumah Awam Pantai Peringgit , 2024


URBAN SCALE
ZURICH
ZURICH Foundation
Reebok
$JDT
FAN TOKEN


تاڤق واريسن دنيا ملاك
THE WORLD HERITAGE SITE OF MELAKA
GAYA ECLECTICS SELAT AWAL (1890 – 1920)
EARLY STRAITS ECLECTICS STYLE (1890 – 1920)
Gaya Eklektik Selat Awal dicirikan dengan penggunaan perhiasan yang agak terkawal pada fasad hadapannya. Pintu dan tingkap kebanyakannya berbingkai kayu dan ditutup kemudiannya telah menjadi kebiasaan. Transom adalah plat melengkung atau separuh bulatan yang dipenuhi kaca. Lubang angin digunakan bagi tujuan ekonomi (penguduraan), komposisi rekabentuk dalam bentuk segi empat sama atau 'diamond' di antara tingkap.
Dinding batu tingkat bawah mempunyai pintu berkembar simetri, sepasang lubang tingkap dan bentuk keliwar dibina di atas
IDEA (RUMAH AWAM – PANTAI PERINGGIT)
QUICK WIN
LONG TERM
ISU LAIN-LAIN
Warning Siren
Risiko Tinggi Banjir

OUR ACTIONS

Resilient Pantai Peringgit

R4C's co-design process with Pantai Peringgit residents and stakeholders transformed local challenges into opportunities.

These community engagements and consultations culminated in a shared vision: **"A safe and connected community, united in facing climate challenges while building a foundation for collective well-being."** Several key projects emerged to address flooding and heat stress and to improve social cohesion and community well-being.

To achieve this vision, projects identified in this CAP aim to:

- Enhance climate resilience planning and services at city level while informing the community under actions within **Our Plan**
- Transform spaces for safer and cooler urban environment under actions within **Our Place**
- Directly empower residents with knowledge, tools, and networks to better adapt and protect themselves from climate change shocks and stresses under actions within **Our People**.

Our Plan	Our Place	Our People
Setting the foundation for informed, resilient actions, from city to community	**Transforming spaces for safer, sustainable living**	**Empowering communities to lead resilient change**

Regarding scope or location, some initiatives will be at the city level and help contribute to Kampung Morten and Pantai Peringgit. Some initiatives would also be twin initiatives, each deployed in both communities, although with local-context considerations.

From Catalyst Project to Longer-Term Impact

This CAP for Pantai Peringgit has also identified **catalyst projects** for immediate implementation using available R4C's Resilient Community Impact Funds and existing resources to be mobilized within the period of June 2025 to June 2026. These projects will demonstrate early success and build momentum for the community's broader resilience journey, while other priority and supporting initiatives will seek new partnerships and funding for scaled-up implementation

Catalyst Projects	Priority Projects	Supporting Projects
Catalyst projects are impactful and with low barriers to implementation, allowing for immediate action. They generate momentum, build confidence among stakeholders and demonstrate tangible improvements in a short timeframe. Certain phases within broader priority projects can also be catalyst projects.	**Priority projects** are impactful for longer-term resilience. They may require more detailed planning, higher investment, or coordination among multiple stakeholders before implementation given their complexities such as regulatory requirements, infrastructure needs or resource allocation.	**Supporting projects** are long-term initiatives that complement and reinforce the broader resilience goals. While they may not be directly tied to the core themes of the plan, they play a crucial role in enhancing community well-being and sustainability.

Across all projects identified within the CAP, they are anticipated to impact:

Systems Strengthening	Space Transformation	Capacity Building
Enhance climate resilience planning and services at the city level, benefiting approximately **70,000 residents** across Melaka.	Revitalize community spaces featuring nature-based solutions and climate-adaptive design, demonstrating safer and cooler urban environments that will impact **930 residents**.	Directly empower **1,380 residents** with knowledge, tools and networks to better adapt to and protect themselves from climate change shocks and stresses.

OUR VISION

"A safe and connected community, united in facing climate challenges while building a foundation for collective well-being"

OUR MISION

Strengthen Flood Resilience	Enhance Heat Adaptation	Improve Food Security	Promote Safety and Community Image	Improve Financial Resilience

OUR ISSUES

Flood **Heat**

OUR KEY CHALLENGES

Aging Population and Economic Vulnerability	Safety Image	Environmental and Structural Challenges	Gaps in Heat Resilience Planning	Recovery Takes Longer After Flood

OUR ACTIONS *(Different project might be in different location)*

Our Plan	Our Place	Our People
CATALYST		
A1 - Strengthening Melaka Command Center's Flood and Heat Response	B1 - Cool Paint B2 - Community Mural (Climate Awareness)	C1 - Community Heat Monitoring C2 - Community Heat Awareness and Outreach C3 - Flood Awareness Workshops
PRIORITY		
A2 - Heat and Health Capacity Building	B3 - Drainage Study and Bioswales (Nature Based Solutions) B4 - Community Greening Intervention	C4 - Flood Early-Warning System
SUPPORTING		
A3- Building Cooling Intervention & Guideline	B5 - Riverbed Restoration B6 - Increasing Water Access	C5 – Increase Adoption of Flood Insurance

ALIGNMENT TO THE FIVE CAPITALS

Human | Social | Physical | Natural | Financial

OUR PLAN

Setting the foundation for informed, resilient actions, from city to community

OUR PLAN – A1 CATALYST

STRENGTHENING MELAKA COMMAND CENTER'S FLOOD AND HEAT RESPONSE

A PROJECT DESCRIPTION

The MBMB is currently in the process of developing an integrated command center that will address the growing challenges, including those posed by urban heat and flooding. This initiative marks an important step toward climate-responsive urban governance. However, there is currently a noticeable gap in the coordination and integration of various data entries, affecting the city's ability to respond to emergencies. Specifically, the connections between data systems, real-time response protocols and community engagement strategies remain underdeveloped.

This presents a timely opportunity to enhance the MBMB's command center framework by incorporating knowledge and best practices from the R4C program. The R4C initiative has produced valuable insights regarding the use of data and an understanding of what communities need on the ground for better response and preparedness.

In addition, the MBMB can benefit from study exchanges and peer learning sessions with other local councils that have implemented similar climate resilience initiatives. These exchanges can offer practical knowledge on successful implementation models, technology integration and cross-sector collaboration, enabling the MBMB to design a more robust, responsive and inclusive command center.

FIGURE 19: The Rio de Janeiro Operations Center integrates data from multiple sources to keep citizens informed about emergency situations.
Source: *Against the Smart City* (Adam Greenfield, 2013)

STRENGTHENING MELAKA COMMAND CENTER'S FLOOD AND HEAT RESPONSE (cont.)

B IMPLEMENTATION BARRIER

Coordination among the various agencies can be complex, especially when trying to integrate legacy systems or standardize data sharing protocols. Existing data sources are often managed by different departments or organizations with limited interoperability, making integration technically and institutionally challenging. Addressing these implementation barriers requires strong leadership, cross-agency collaboration and clear communication to build trust and foster a shared vision for a more resilient and connected Melaka

C PROJECT DETAILS

Location/scale	City-wide
Shocks/stresses	Flash flooding, extreme heat,, limited governance capacity/services
Implementor	Majlis Bandaraya Melaka Bersejarah
Partners	Government agencies: ○ Health Department, Negeri Melaka ○ Department of Drainage and Irrigation, Negeri Melaka ○ Meteorological Department, Negeri Melaka
Phases	Phase 1: Development of input from R4C to the MBMB's command center (Q2-Q4 2025) Phase 2: Integration of R4C input into the MBMB's command center (2026)
Resilience capitals	Physical, social

FIGURE 10: An example of Urban Observatory (UO) deployments of a Visible Near-Infrared (VNIR) Hyperspectral camera in United State
Source: The Urban Observatory: A Multi-Modal Imaging Platform for the Study of Dynamics in Complex Urban Systems, 2021

OUR PLAN – A2 PRIORITY

HEAT AND HEALTH CAPACITY BUILDING

A PROJECT DESCRIPTION

Heat is an increasing concern in Melaka. Unfortunately, local understanding of heat is limited, as identified in the CRMC survey. Heat particularly affects children and the elderly. Living in high temperatures can lead to various heat-related illnesses such as heat stroke, high fever, dehydration and more. Extreme heat can make people very sick, especially the elderly, children and those who work directly in the sun. In Melaka, there are volunteer community paramedics, however heat considerations are not yet thoroughly included in their training, so there is an opportunity to better align this service with people's needs.

At the city level, local authorities, in collaboration with the medical community, could prepare and disseminate clear and simple health information regarding heat. This could include encouraging simple actions such as drinking plenty of water and staying in the shade. Local governments also need to implement heat action plans and early-warning systems. It is important to ensure that this knowledge is effectively communicated within the community. Activities such as trainer training for local leaders, paramedic communities or volunteers could help facilitate increased awareness at the community level, starting with areas like Pantai Peringgit before expanding throughout the city.

It is expected that this initiative will initially increase the knowledge of heat and health among health workers and volunteers, which, in turn, will help reduce heat risks and enhance preparedness for the broader community. With better understanding, preparation and community support, communities can mitigate the harmful effects of extreme heat.

B PROJECT DETAILS

Location	City level
Shocks/stresses	Extreme heat, heat knowledge gap, limited health services
Implementor	Majlis Bandaraya Melaka Bersejarah
Partners	○ Ministry of Health, Malaysia ○ Health Department, Negeri Melaka ○ Monash University, Malaysia ○ Paramedic Community (ParaCom) ○ St. John Ambulance
Phases	Phase 1 – Preparation of heat advisory (Q3-Q4 2025) Phase 2 – Training for trainers (2026)
Resilience capitals	Human, social

FIGURE 21: Cycling paramedic in Melaka
Source: *Melaka Introduces Cycling Paramedics that Provide First Aid Before Ambulances Arrive* (World of Buzz, 2024)

Our PLAN – A3 SUPPORTING

BUILDING COOLING INTERVENTION AND GUIDELINE

A PROJECT DESCRIPTION

Extreme heat poses significant health risks, especially for vulnerable populations such as the elderly and children. Heat monitoring has revealed high indoor temperatures and humidity in Kampung Morten and Pantai Peringgit, where community members often remain indoors. It is essential for local authorities to encourage effective and affordable at-home cooling solutions based on insights from R4C interventions and case studies.

Developing and sharing cooling guidelines will help create comfortable indoor environments during extreme heat, safeguarding communities from heat-related illnesses. These guidelines will offer practical tips for community members, helping families to reduce their electricity bills by minimizing reliance on air conditioning. Using simple, low-cost cooling techniques with locally sourced materials and traditional designs, the guidelines can also be translated to inform future building permits, encouraging builders and developers to adopt heat-adaptive designs.

B PROJECT DETAILS

Location	Pantai Peringgit, City-wide, Kampung Morten
Shocks/stresses	Extreme heat, aging population, economic inequality
Implementor	Majlis Bandaraya Melaka Bersejarah
Partners	○ Department of Town Planning Department of Engineering Melaka Housing Agency ○ Researchers
Resilience capitals	Human, physical, natural

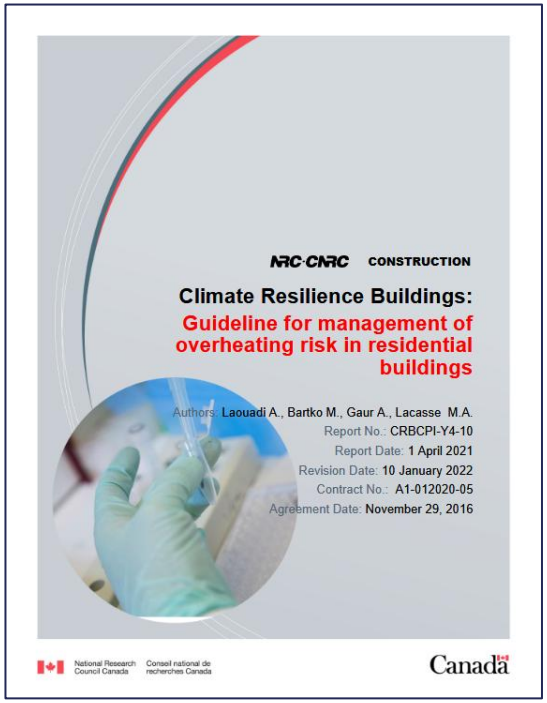


FIGURE 22: An example of guidelines: Climate Resilience Buildings: Guideline for Management of Overheating Risk in Residential Buildings.

Source: NRC Construction Research Centre, 2021.

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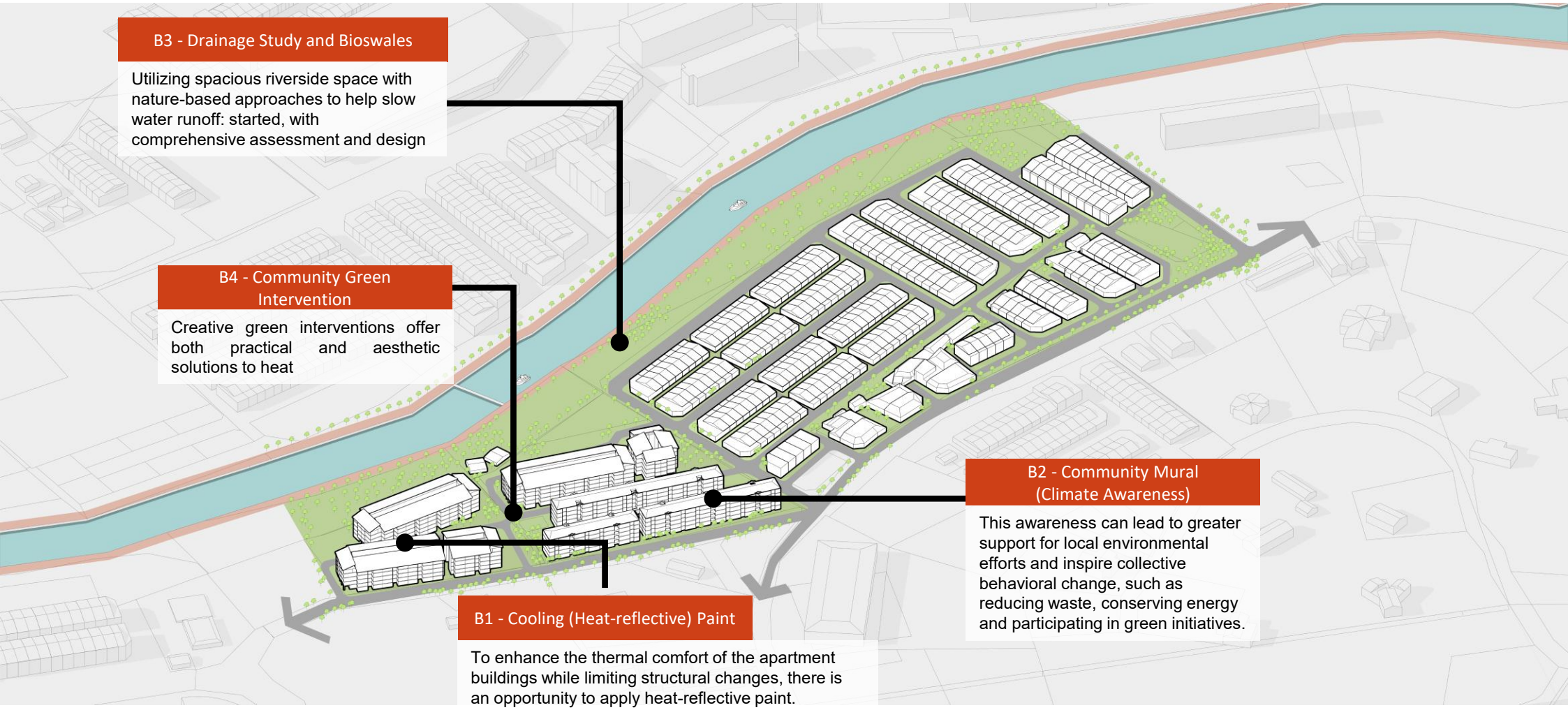
OUR PLACE

Transforming spaces for safer, sustainable living

Overview of Proposed Projects – Pantai Peringgit



B3 - Drainage Study and Bioswales

Utilizing spacious riverside space with nature-based approaches to help slow water runoff: started, with comprehensive assessment and design

B4 - Community Green Intervention

Creative green interventions offer both practical and aesthetic solutions to heat

B2 - Community Mural (Climate Awareness)

This awareness can lead to greater support for local environmental efforts and inspire collective behavioral change, such as reducing waste, conserving energy and participating in green initiatives.

B1 - Cooling (Heat-reflective) Paint

To enhance the thermal comfort of the apartment buildings while limiting structural changes, there is an opportunity to apply heat-reflective paint.

*Indication of the potential locations for projects related to physical transformation of Pantai Peringgit

OUR PLACE-B1 CATALYST

COOL PAINT

A PROJECT DESCRIPTION

The Rumah Pangsa Pantai Peringgit complex consists of seven low-income apartments housing over 2,000 residents. Heat monitoring has revealed relatively high indoor temperatures, which make living conditions uncomfortable, particularly during hotter months. This issue is exacerbated by Malaysia's equatorial climate, which exposes the buildings to direct sunlight for extended periods, leading to elevated surface temperatures. In addition, financial constraints faced by the community underscore the need for passive cooling interventions, which are less costly than air conditioning.

To enhance the thermal comfort of the apartment buildings while limiting structural changes, there is an opportunity to apply heat-reflective paint. This type of paint reflects sunlight and reduces heat absorption, resulting in cooler indoor temperatures. Additionally, continuous monitoring with heat sensors will be implemented. The project will be executed in collaboration with the Melaka State Housing Board, the private sector, and research partners. This initiative will be paired with another project: an art mural to raise climate awareness among the community.

Overall, the initiative aims to improve residents' quality of life, promote energy savings and contribute to a more sustainable and heat-resilient community. Together with the community art mural, it will also contribute to revitalizing the image of the community. Insights gained from this initiative may also help inform future building guidelines by local governments for further replication.

Figure 23: The complex of Rumah Pangsa Pantai Peringgit
Source: Urban SCALE, 2025

OUR PEOPLE – B1 CATALYST

COOL PAINT (cont.)

B IMPLEMENTATION BARRIER

Challenges to the implementation of cooling paint at Rumah Pangsa Pantai Peringgit include limited funding, restricting full coverage across blocks. While support from Melaka State Housing Agency and resident associations has been secured, coordination between the paint vendor and stakeholders remains essential. Weather conditions must be anticipated for scheduling. Monitoring will document temperature changes and the performance of the intervention. Consideration should be given to combining façade painting with roof treatments and vegetation for optimized cooling, though these require additional coordination. A long-term maintenance plan is essential, as the heat-reflective properties of the paint diminish over time, and periodic reapplication is required to sustain the benefits.

C PROJECT DETAILS

Location	Rumah Pangsa Pantai Peringgit
Shocks/stresses	High indoor heat, economic inequality, energy affordability
Implementors	Resilient Cities Network, Majlis Bandaraya Melaka Bersejarah
Partners	Melaka State Housing Agency AkzoNobel (Dulux) Nanyang Technological University
Phases	Phase 1: Site assessment and mobilization (Q2 2025) Phase 2: Heat-reflective painting (Q2-Q4 2025) Phase 3: Monitoring and lessons learnt (Q3 2025 – Q2 2026)
Resilience capitals	Physical

FIGURE 24: Learning from Singapore's heat-reflective painting in more than 100 Housing Development Boards
Source : *Shaping a Heat Resilient City ,* (Urban Redevelopment Authority 2025)

COMMUNITY MURAL (CLIMATE AWARENESS)

A PROJECT DESCRIPTION

Climate change is an urgent global issue that has far-reaching consequences for ecosystems, economies and communities worldwide. Its impacts, however, are not just abstract or distant. In communities like Rumah Pangsa Pantai Peringgit, these challenges already manifest as higher energy costs, increased vulnerability to heatwaves and deteriorating infrastructure. By creating a mural in a prominent location within the community, this project serves as a highly visible platform for raising awareness about these environmental challenges.

Creating the mural will involve local artists and the community to foster a sense of ownership and empowerment. This participatory approach encourages community members to take pride in the message and collaborate towards a common goal of promoting environmental consciousness. It also offers an opportunity for the community to actively contribute to a project that benefits their neighborhood. It can encourage conversations among community members and visitors, helping them understand that climate change is not an abstract issue but a real, present threat impacting their homes and livelihoods. This expected increased awareness can lead to greater support for local environmental efforts and inspire collective behavioral change, such as reducing waste, conserving energy and participating in green initiatives.

FIGURE 25: Illustration of a community mural on climate change in Rumah Pangsa Pantai Peringgit
Source: Urban SCALE, 2025

OUR PLACE – B2 CATALYST

COMMUNITY MURAL (CLIMATE AWARENESS) (cont.)

B IMPLEMENTATION BARRIER

While community involvement is essential, gaining this cooperation will require clear communication about the mural's purpose. Although the housing agency has given its approval in principle, reaching an agreement on the final design will also require attention from early on in the project, as residents may express perspectives that authorities might find challenging, in turn requiring diplomatic mediation. Weather conditions may delay painting or affect durability, while finding a suitable location balancing visibility with official approval presents logistical considerations. Thoughtful facilitation between stakeholders can effectively address these challenges.

C PROJECT DETAILS

Location/Scale	Rumah Pangsa Pantai Peringgit
Shocks/stresses	Heat, lack of climate awareness, aging building
Implementor	Resilient Cities Network, Majlis Bandaraya Melaka Bersejarah
Partners	Melaka State Housing Agency AkzoNobel (Dulux) Mural artist
Phases	Phase 1: Participatory design development (Q2-Q3 2025) Phase 2: Mural painting (Q3-Q4 2025)
Resilience Capitals	Physical

FIGURE 25: Art interactive session with children to get input for the climate art mural
Source: Urban SCALE, 2025

OUR PLACE – B3 PRIORITY

DRAINAGE STUDY AND BIOSWALES (NATURE-BASED SOLUTIONS)

A PROJECT DESCRIPTION

Pantai Peringgit is highly susceptible to flash floods and water stagnation, particularly during heavy rainfall and monsoon seasons. Urbanization and increased paved surfaces have significantly reduced natural water infiltration, intensifying runoff issues. Along the river, there is space available for intervention. However, the water tends to remain in place for extended periods, notably impacting the houses closest to the river, which must sometimes be evacuated.

This project proposes a comprehensive approach, beginning with a wider-area drainage study to identify critical water flow patterns, infiltration potential, and strategic intervention points. The study will incorporate nature-based solutions throughout the watershed, considering how bioswales and other green infrastructure can work together as a system. Based on findings and available resources, implementation would proceed in stages, with priority areas receiving bioswales first to demonstrate the principle.

The first construction would utilize current resources to construct bioswales in one strategic location, filtering out pollutants like oil and sediments before water reaches the river, while providing shade and cooling effects. This pilot intervention would be monitored for effectiveness and serve as a model for subsequent phases. The anticipated outcomes include improved stormwater management, reduced flooding, decreased erosion and enhanced aesthetics. This phased approach allows for learning and adaptation before scaling up to address the broader drainage challenges identified in the study.

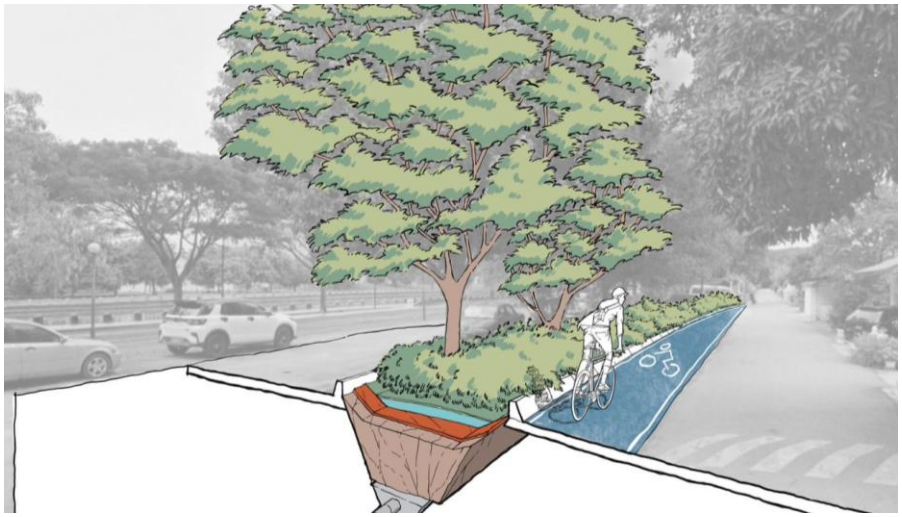


FIGURE 26: Illustration of bioswales (a nature-based solution) concept at Rumah Awam Pantai Peringgit
Source: Urban SCALE, 2025

B PROJECT DETAILS

Location	Rumah Awam Pantai Peringgit
Shocks/stresses	Flooding, inadequate infrastructure
Implementor	Majlis Bandaraya Melaka Bersejarah
Partners	○ Department of Drainage and Irrigation, Negeri Melaka ○ Technical expert
Phases	Phase 1: Assessment and design (Q3-Q4 2025) Phase 2: Implementation stage 1 (Q1 2026) Phase 3: Further implementation
Resilience capitals	Social, physical, natural

OUR PLACE – B4 Priority

COMMUNITY GREENING INTERVENTION

A PROJECT DESCRIPTION

Rising temperatures pose significant challenges at Rumah Pangsa Pantai Peringgit, discouraging outdoor activities in shared spaces. With expanses of concrete between buildings, limited trees and almost no vegetation, this low-income apartment complex experiences severe heat island effects that are uncomfortable for residents. This project proposes strategic interventions including green pavements, shade trees and community gardens, all of which would serve multiple purposes.

Implementing this project will require close coordination with the Melaka State Housing Agency, which oversees the property. These green elements will complement and optimize the cooling effects of the upcoming cooling-paint project, creating a comprehensive heat reduction strategy. Green pavement can replace portions of concrete areas (figure 27), while trees will provide shade. Community gardens offer both cooling effects and food security benefits for economically challenged residents. A participatory approach will enable residents to help design and maintain these features.

Beyond mitigating heat, these efforts transform sterile spaces into community assets while addressing food insecurity. Heat sensors will track temperature reductions, quantifying how greening amplifies the benefits of reflective-paint interventions. Engaging residents encourages skills development and collective responsibility while creating dignified outdoor spaces. The lessons learnt could serve as a model for other public-housing developments facing similar environmental challenges.

Figure 27: Illustration of green parking pavement
Source: Urban SCALE, 2025

B PROJECT DETAILS

Location	Rumah Pangsa Pantai Peringgit
Shocks/stresses	Heat, lack of green, lack of public space, food insecurity
Implementor	Majlis Bandaraya Melaka Bersejarah
Partners	○ State government ○ Residents' association ○ Local communities ○ Corporations
Phases	Phase 1: Identify potential collaborators Phase 2: Assessment and co-design Phase 3: Implementation (permanent installation)
Resilience capitals	Social, physical, natural

OUR PLACE – B5 SUPPORTING

RIVERBED RESTORATION

A PROJECT DESCRIPTION

Pantai Peringgit faces flash floods due to severe sedimentation that has reduced the river's capacity. This sedimentation creates odors and health risks for residents. The riverbank, which is more spacious than areas in the city center, creates opportunities for installing bioswales that complement riverbed restoration using nature-based solutions to slow water movement. The MBMB and state agencies are responsible for addressing these river capacity issues.

Restoring the riverbed is crucial for enhancing the river's water-retaining capacity and reducing flood risks. Authorities should employ gentle sediment removal techniques, clear flow-hindering materials and incorporate green features that purify water and reduce runoff velocity. The riverside area allows for watershed management that integrates bioswales to capture and gradually release stormwater, creating a system that increases capacity and moderates flow during intense rainfall.

B PROJECT DETAILS

Location	Pantai Peringgit
Shocks/stresses	Flood, inadequate infrastructure
Partners	○ State Government ○ Department of Drainage and Irrigation, Negeri Melaka (JPS)
Resilience capitals	Physical, natural

OUR PLACE – B6 SUPPORTING

INCREASE WATER ACCESS

A PROJECT DESCRIPTION

Residents of Rumah Pangsa Pantai Peringgit face water supply challenges. In upper-floor units that experience frequent outages, residents must carry water up multiple flights of stairs, which is especially burdensome for the elderly. These disruptions stem from deteriorating infrastructure and malfunctioning pumps. Reliable water access is critical given the complex's high indoor temperatures, as residents need consistent water for cooling.

This initiative would repair critical components through collaboration with water utility. The program includes fixing tank leaks, upgrading pumps for consistent pressure and implementing joint maintenance protocols. Repairs would target failing pipes while establishing monitoring systems to prevent outages. Once reliable water access has been restored, the community, including its more vulnerable members, will regain water security to better cope with extreme heat events.

B PROJECT DETAILS

Location	Rumah Pangsa Pantai Peringgit
Shocks/stresses	Heat, limited water supply, inadequate infrastructure
Partners	○ Lembaga Perumahan Negeri Melaka ○ Majlis Bandaraya Melaka Bersejarah
Resilience capitals	Human, natural

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OUR PEOPLE

Empowering communities to lead resilient change

OUR PEOPLE – C1 CATALYST

COMMUNITY HEAT MONITORING

A PROJECT DESCRIPTION

There remains a lack of comprehensive data to understand environmental conditions in Pantai Peringgit. The 2024 CRMC survey identified certain concerns, including limited community knowledge of heat risks. This is to be addressed by engaging community members through educational sessions and gathering volunteers for a citizen science approach. With committed household participation, heat sensors were installed with support from Nanyang Technological University to accurately record indoor and outdoor temperature data in the community.

The monitoring project, which has been running since October 2024, involves community leaders, MBMB officials, and households working with researchers. Privacy remains critical, with sensors collecting only environmental data, which is synthesized into understandable visual reports shared with the community.

Early findings showing high indoor temperatures, especially during the night in Rumah Pangsa Pantai Peringgit, have highlighted the need to protect households and improve thermal comfort. This data-driven approach has catalyzed strategies like cooling-paint applications, while empowering stakeholders to address heat challenges.

Looking forward, the aim is to expand monitoring to evaluate heat-related project implementations and build analytical capacity within local authorities. Transferring knowledge and practices to city officials will ensure the project's sustainability and enable future replication across other communities, strengthening the initiative's long-term impact through combining resident experiences with scientific data for informed planning.

FIGURE 28: Outdoor Heat Sensor Installation by Majlis Bandaraya Melaka Bersejarah and Nanyang Technology University
Source: Jabatan Perancangan Bandar, Majlis Bandaraya Melaka Bersejarah, 2025

COMMUNITY HEAT MONITORING (cont.)

B IMPLEMENTATION BARRIER

Gaining community trust is crucial for heat monitoring success. Despite educational efforts, some residents may hesitate to participate because of privacy concerns or uncertainty about benefits, requiring continuous engagement and demonstration of tangible value.

Long-term sustainability depends on effectively transferring technical knowledge to local stakeholders. Without building this capacity through training and mentorship, the initiative risks becoming a one-time effort rather than an enduring practice that continues informing community decisions and policy development after initial researcher involvement ends.

C PROJECT DETAILS

Location/Scale	Rumah Awam and Rumah Pangsa Pantai Peringgit
Shocks/stresses	Heat, lack of heat knowledge
Implementor	Majlis Bandaraya Melaka Bersejarah
Partner	○ Nanyang Technology University
Phases	Phase 1: Identification of potential collaborators among communities in Pantai Peringgit (Q2-Q3 2024) Phase 2: Installation of heat sensors indoors and outdoors (Q3 2024) Phase 3: Data collection and analysis; monitoring
Resilience capitals	Human, social, financial

FIGURE 29: Installation of a heat sensor
Source: Urban SCALE, 2025

FIGURE 30: Heat sensor device
Source: Urban SCALE, 2025

OUR PEOPLE – C2 CATALYST

COMMUNITY HEAT AWARENESS AND OUTREACH

A PROJECT DESCRIPTION

In Rumah Pangsa Pantai Peringgit, a multistorey apartment complex with no elevators and many young families, heat awareness efforts must be approached with care. Heat monitoring data show indoor temperatures consistently hovering around 30°C, including at night when families sleep. Working with the residents' association, which has strong networks throughout the buildings, will ensure communication reaches all floors and demographic groups.

This initiative will translate heat data into relatable formats: visual posters in stairwells, workshops with health experts, and engaging activities for children like drawing competitions or heat-themed games. Health professionals will emphasize the connection between night-time heat exposure and health impacts relevant to apartment dwellers. These approaches will help families understand how persistent high temperatures affect sleep quality and health, particularly in upper-floor units.

Combining monitoring data with community knowledge will create effective strategies for managing night-time heat. Involving the residents' association will ensure sustainable awareness programs continue beyond the initial outreach phase. This collaborative approach could lead to stronger policies that protect all residents, especially children, who are vulnerable to heat- related sleep disruption.

FIGURE 31: Community engagement on heat awareness
Source: Urban SCALE, 2025

COMMUNITY HEAT AWARENESS AND OUTREACH (cont.)

B IMPLEMENTATION BARRIER

Implementing heat awareness in Rumah Pangsa Pantai Peringgit faces unique challenges. Many residents underestimate night-time heat risks, viewing sustained 30°C temperatures as uncomfortable rather than harmful to sleep quality and child development. The five-storey walk-up structure without elevators creates barriers for reaching households, especially on the upper floors, which are the most strongly affected by heat. Financial constraints limit cooling strategies, as residents with low incomes cannot afford fans nor higher electricity costs. Cultural barriers exist around night-time routines, including cooking habits that can add heat, and windows being kept closed for security. To overcome these challenges, awareness efforts must be contextualized to apartment realities, emphasizing low-cost strategies specifically for night-time cooling in upper-floor units. Working with the residents' association networks will ensure sustainable engagement, while connecting with additional visual initiatives like community art projects can create complementary reminders about heat management throughout the complex. Expansion of the program to the neighboring Rumah Awam Pantai Peringgit should also be considered.

C PROJECT DETAILS

Location/scale	Rumah Awam and Rumah Pangsa Pantai Peringgit
Shocks/stresses	Heat, lack of heat knowledge, aging community
Implementor	Majlis Bandaraya Melaka Bersejarah
Partners	○ Health Department, Negeri Melaka ○ Monash University, Malaysia ○ Nanyang Technology University
Phases	Phase 1: Identification of potential partners for the program Phase 2: Development of awareness and outreach module and activities Phase 3: Programme execution
Resilience capitals	Human, social, financial

FIGURE 31: Community engagement on heat awareness
Source: Urban SCALE, 2025

OUR PEOPLE – C3 CATALYST

FLOOD AWARENESS WORKSHOP

A PROJECT DESCRIPTION

As climate change drives increasingly severe weather events, flooding in Rumah Awam Pantai Peringgit has already demonstrated devastating impacts, with the 2022 floods forcing evacuations and damaging household goods. These experiences highlight that flooding here is a genuine emergency threatening residents' safety and economic security. Flood awareness and emergency preparation kits have become essential components of a strategy to enhance community resilience in this vulnerable area.

Flood awareness must focus on evacuation protocols, teaching residents to recognize when staying in place becomes dangerous. This includes identifying safe evacuation routes from buildings, understanding what documents to protect and knowing community gathering points where emergency services coordinate assistance. Emergency flood kits need to be designed for quick evacuation scenarios, containing waterproof document holders, emergency contacts, medication lists, flashlights and essential supplies that residents can quickly grab when leaving.

Combining targeted awareness with properly equipped kits will enhance this community's ability to respond effectively during critical situations. once this has been implemented, Pantai Peringgit residents will be empowered to make informed decisions during floods, potentially preventing the loss of valuable items that occurred previously. These preparations are crucial for residents whose household goods represent significant investments that would previously be lost to flooding, making the community more resilient against increasingly unpredictable flood events.

FIGURE 24: Flooding in 2022
Source: Community of Rumah Awam Pantai Peringgit, 2022

FLOOD AWARENESS WORKSHOP

B IMPLEMENTATION BARRIER

Despite the clear benefits of flood awareness programs and the distribution of flood kits, several barriers can hinder their successful implementation in communities like Rumah Awam Pantai Peringgit. One major challenge is limited funding and resources, which can affect the ability to conduct outreach programs or supply kits to all households. Additionally, there may be low community engagement due to a lack of trust in authorities, limited awareness of flood risks or competing daily priorities. Logistical challenges, such as distributing kits to every household – especially in more remote or densely populated areas – can also complicate implementation. Furthermore, without continuous education and follow-up, initial efforts may become less effective over time, as awareness fades and supplies within kits expire or get misplaced. Overcoming these barriers requires coordinated efforts among local government, non-governmental organizations and community leaders to ensure sustainable, inclusive and well-maintained flood preparedness strategies.

C PROJECT DETAILS

Location/scale	Rumah Awam Pantai Peringgit
Shocks/stresses	Flooding, limited capacity on disaster response
Implementor	Majlis Bandaraya Melaka Bersejarah
Partners	○ State Government ○ Department of Drainage and Irrigation, Negeri Melaka (JPS)
Phases	Phase 1: Scoping, needs assessment and feasibility study Phase 2: Procurement and installation Phase 3: Testing, training and simulation Phase 4: Launch and monitoring
Resilience capitals	Physical, social

FIGURE 25: Flood survival kit
Source: *IMAM Response & Relief Team – IMARET, 2019*

OUR PEOPLE – C4 PRIORITY

FLOODING EARLY-WARNING SYSTEM

A PROJECT DESCRIPTION

As a flood-prone area that experiences severe inundations requiring evacuations, Rumah Awam Pantai Peringgit faces challenges in preparing its residents for rising waters. Community engagement has waned as residents grow fatigued by repeated events. Strengthening the early-warning system by connecting it to the MBMB Command Center would provide timely alerts while reinvigorating response mechanisms through the existing Development and Coordination Committee structure.

This project begins by assessing current warning systems while acknowledging evacuation fatigue. Working with the leaders of the Development and Coordination Committee to rebuild readiness will address residents' concerns about the area being susceptible to crime when evacuations occur. Though crime rates have improved, this lingering image makes some reluctant to leave their homes unattended during floods. Improvements include establishing clear alert thresholds, creating secure evacuation protocols and providing training that addresses both safety concerns and the necessity of evacuation.

The anticipated outcome is a system that overcomes evacuation reluctance by addressing security fears through community-led monitoring during evacuations. Integrating Development and Coordination Committee members into the formal response framework creates ownership while ensuring authorities understand the complex social factors affecting evacuation decisions. This approach balances the community's improved safety reality with their flood protection needs, creating protocols that respect both property security and personal safety during increasingly severe floods.

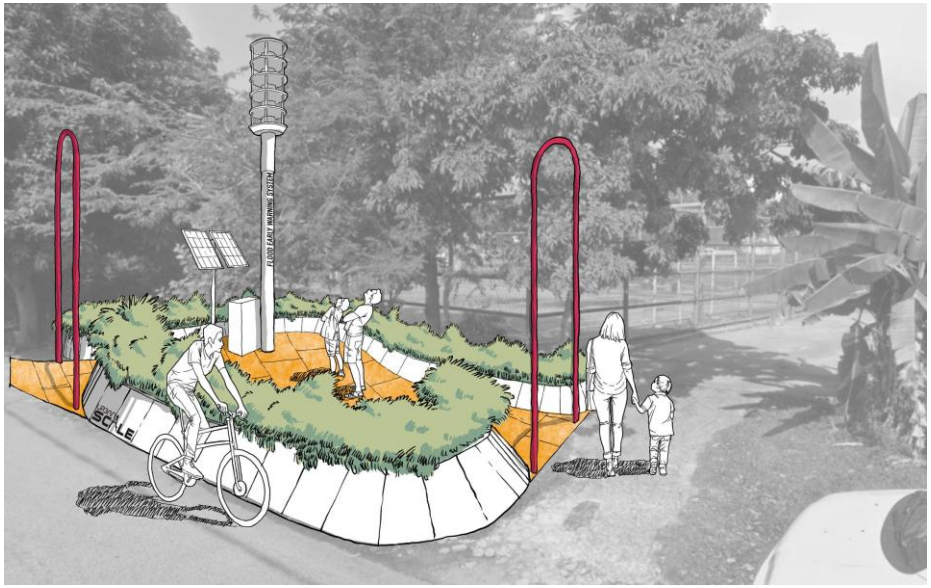

FIGURE 27: Illustration of flooding early-warning system signage
Source: Urban SCALE, 2025

B PROJECT DETAILS

Location	Pantai Peringgit
Shocks/stresses	Flood, limited capacity on disaster response
Implementor	Majlis Bandaraya Melaka Bersejarah
Partners	○ State government ○ Department of Drainage and Irrigation, Negeri Melaka
Phases	Phase 1: Scoping, needs assessment and Feasibility study Phase 2: Procurement and installation Phase 3: Testing, training and simulation Phase 4: Launch and monitoring
Resilience capitals	Physical, social

OUR PEOPLE – C5 SUPPORTING

INCREASE ADOPTION OF FLOOD INSURANCE

A PROJECT DESCRIPTION

he CRMC survey showed that many residents in Rumah Awam Pantai Peringgit do not have flood insurance, despite the evacuations that were needed during the 2022 flood. Few households have invested in elevated entrances, having nonetheless lost goods and suffered damage to their vehicles. With their incomes being slightly higher than in other areas, residents here may have better capacity for insurance coverage, though affordability remains a key issue.

Before suggesting insurance solutions, a deeper assessment of residents' capacity for, constraints to and interest in insurance products is necessary. This study would identify affordable options that align with specific needs, particularly coverage for household contents and vehicles that have previously been most strongly affected. While structural damage may be the government's responsibility in public housing, personal property protection falls to residents.

The next steps should include community consultations to gauge awareness and financial capacity, followed by discussions with insurance providers about appropriate products. With proper flood insurance, residents can recover more quickly from future floods without depleting their savings. Insurance could become critical to this community's resilience strategy, particularly for households with the financial capacity to invest in this protection.

B PROJECT DETAILS

Location	Rumah Awam Pantai Peringgit
Shocks/stresses	Flood, limited financial literacy
Partners	○ State government ○ Private sector
Resilience capitals	Human, financial

FROM ACTION PLANNING TO IMPLEMENTATION

The approach in this CAP integrates city-level interventions with community-focused projects in Pantai Peringgit.

Within the next year (June 2025 to June 2026), we will see the launch of catalyst projects and the initial phases of priority projects utilizing Resilient Community Impact Funds and existing resources, demonstrating immediate progress and building momentum, as can be seen in the below projects' timeline.

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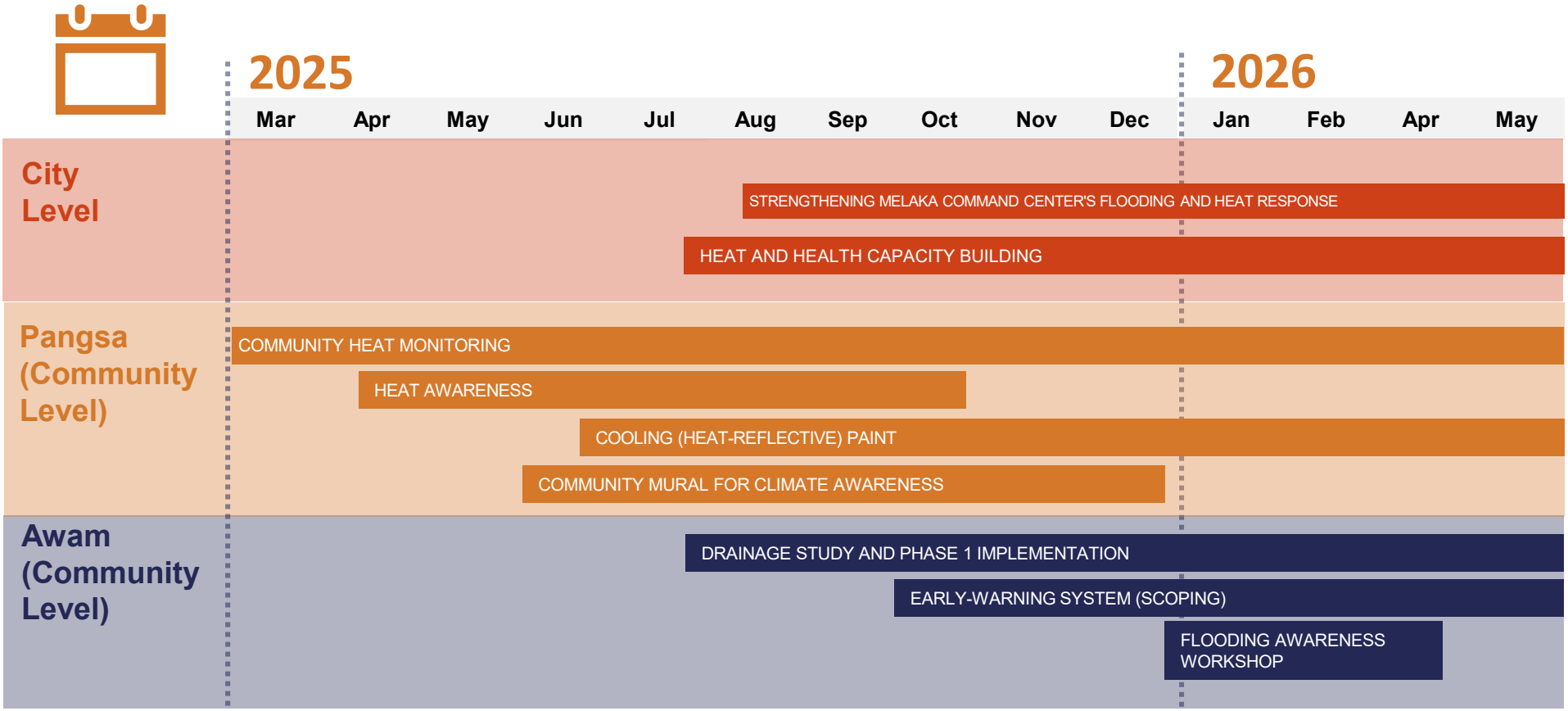

** The timeline features projects with secured or anticipated funding*

GOING FORWARD AND CALL TO ACTIONS

In Pantai Peringgit, R4C program has unpacked the interconnected challenges and mapped opportunities in the communities. Through this CAP, the program aimed to promote the Pantai Peringgit vision of “A safe and connected community, united in facing climate challenges while building a foundation for collective well-being.”

Beyond initial efforts already identified within catalyst projects, further collaborative partnerships are needed. For sustainable impact, we need diverse stakeholders to contribute expertise, additional funding opportunities for planned projects awaiting resources, and continued community engagement to ensure solutions effectively address local needs.

We invite stakeholders to join in to transforming Pantai Peringgit into a model of urban resilience, where residents feel secure during floods, connected to city services, and protected from heat stress. The integrated solutions presented above demonstrate how a community can become safer, better connected and more climate-resilient, serving as examples for other communities facing similar urban challenges.

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