PNBCAP
Penang Nature-based Climate Adaptation Programme

COMMUNITY FLOOD PREPAREDNESS TRAINING TOOLKIT

Supported By

ADAPTATION FUND

UN-HABITAT

Citation:
Think City. (2025). PNBCAP Community Preparedness Training Toolkit.

Acknowledgements
The Penang Nature-based Climate Adaptation Programme (PNBCAP) is a goal-oriented initiative aimed at enhancing community resilience through nature-based climate adaptation solutions. It is led by UN-Habitat and supported by a grant from the Adaptation Fund (AF), with Think City as the main implementing entity. The programme is delivered in close collaboration with the Department of Irrigation and Drainage (JPS) Penang, the Penang Island City Council (MBPP), and other state and community partners.

About Community Preparedness Training Toolkit
The Community Preparedness Training Toolkits offer step-by-step guidance and practical instructions to support community leaders, facilitators, and local organisations in enhancing local climate resilience. These toolkits are designed to build knowledge, foster local action, and promote sustainable, nature-based solutions in vulnerable communities.

Cover Image Credit: loeskieboom

Credits: The Department of Irrigation and Drainage (JPS), the Penang Island City Council (MBPP), Penang State Health Department, UN-Habitat, Adaptation Fund.

Acknowledged Contributors: Disaster Management Unit (UPB), Village Community Management Council (MPKK), Other community stakeholders.

Published by
Think City Sdn. Bhd.
Registration No: 200901026839 (869941-P)
Level 1, No 21-35, UAB Building, Gat Lebuh China, 10300 George Town, Penang www.thinkcity.com.my

Implementing Partners

thinkCITY
Making Cities Liveable, Together.

MAJLIS BANDARAYA PULAU PINANG

JABATAN PENGAIRAN DAN SALIRAN
NEGERI PULAU PINANG

PNBCAP
Penang Nature-based Climate Adaptation Programme

Penang Nature-based Climate Adaptation Programme
(PNBCAP)

Community **Flood** Preparedness Training Toolkit

List of Abbreviations

APM	The Malaysia Civil Defence Force
ATM	Malaysian Armed Forces
JKM	Department of Social Welfare
JBPM	Fire and Rescue Department of Malaysia
JPS	Department of Irrigation and Drainage
KKM	Ministry of Health Malaysia
MBPP	Penang Island City Council
MPKK	Village Community Management Council
NADMA	National Disaster Management Agency
PDRM	Royal Malaysia Police
PKOB	Pusat Kawalan Operasi Bencana
PNBCAP	Penang Nature-based Climate Adaptation Programme
PWD	Persons with Disabilities
UN-Habitat	United Nations Human Settlements Programme

Table of Contents

How to use this Toolkit

The PNBCAP Community Preparedness Toolkit is designed for all members of the community and partner institutions involved in building resilience to climate impacts such as floods and heatwaves. It provides step-by-step guidance, practical exercises, and communication materials to support action and decision-making at multiple levels.

Community Members

(*Residents, youth, community groups, local associations*)

You can use this toolkit to:

- Understand the climate risks that affect your neighbourhood and daily life.
- Learn practical steps to prepare your household and community for floods and heatwaves.
- Participate in community-based preparedness training and early warning systems.
- Share feedback and ideas to strengthen local adaptation actions.
- Encourage neighbours, schools, and local businesses to take part in collective resilience activities.

Local Authorities and Community Leaders

(*Local Authorities, MPKKs, NGOs, and civil society groups*)

You can use this toolkit to:

- Plan, coordinate, and deliver community training sessions on flood or heatwave preparedness.
- Identify vulnerable groups and design targeted interventions (e.g., safe shelters, cooling spaces).
- Integrate local knowledge and community input into climate adaptation planning.
- Monitor and record preparedness activities and share outcomes with PNBCAP partners.

First Responders and Emergency Support Agencies

(*St. John Ambulance of Malaysia, Red Crescent, APM, Bomba, Unit Pengurusan Bencana*)

These agencies can use the toolkit to:

- Support evacuation drills and community simulation exercises.
- Strengthen coordination between community volunteers and formal emergency responders.
- Promote public awareness on heat exhaustion, heat stroke, and flood-related health risks.
- Complement national disaster guidelines with community-friendly materials.

Technical Agencies and Partners

(*State Agencies*)

You can use this toolkit to:

- Strengthen technical collaboration between agencies and local communities.
- Align preparedness training with existing policies
- Identify pilot sites to demonstrate effective nature-based solutions (NbS) for urban resilience.
- Develop data and tools for scaling up community-based adaptation approaches.

Schools and Youth Groups

(*Students, teachers, youth clubs, and climate ambassadors*)

You can use this toolkit to:

- Learn about the science behind floods and heatwaves and their impact on communities.
- Carry out school preparedness activities such as emergency drills and awareness campaigns.
- Integrate the toolkit content into climate education and sustainability clubs.

1

Introduction

Overview of PNBCAP

Overview of PNBCAP

The Penang Nature-based Climate Adaptation Programme for Urban Areas of Penang is Malaysia's first comprehensive adaptation initiative designed to address the growing challenges of climate change. This multi-year programme, funded by the Adaptation Fund (AF) and implemented under the guidance of the United Nations Human Settlements Programme (UN-Habitat), combines the expertise of the Penang Island City Council (MBPP), the Department of Irrigation and Drainage (JPS), and Think City as the main implementing entity.

This flood preparedness module is designed to enhance community awareness, preparedness, and resilience against flood disasters. With the increasing impact of climate change, floods are expected to occur more frequently, posing significant health, economic, and social challenges. Vulnerable groups such as the elderly, children, women, persons with disabilities (PWD), and migrant workers are at higher risk.

The focus of this module is on simple and practical solutions to reduce flood risks, enhance flood preparedness, and strengthen adaptation measures at the community level.

This module covers five (5) main topics:

- **Topic 1** — **Introduction**
- **Topic 2** — **Flood Disasters**
- **Topic 3** — **Causes and Risks of Floods**
- **Topic 4** — **Flood Resilience**
- **Topic 5** — **Trainer Guide**

2

Flood

Introduction to Flood

Flood Phenomena in Penang

Importance of Flood Management

Introduction to Floods

Flooding is a frequent natural disaster in Malaysia, primarily due to the country's tropical climate, which receives a high annual rainfall. Flooding is defined as the overflow of bodies of water, such as rivers, lakes, or drainage systems, caused by heavy rainfall, melting ice, high tides, and blockages in channels. These flood events have plagued residents living near riverbanks and have had significant impacts on property, infrastructure, water resources, agriculture, public health, and many other aspects.

According to the Department of Irrigation and Drainage (JPS), there are four main types of floods in Malaysia, namely monsoon floods, flash floods, coastal floods, and stagnant floods.

Monsoon Flood

Floods that occur due to continuous heavy rainfall lasting more than 6 hours, typically during the northeast monsoon or rainy season. This type of flood is usually muddy, with high river levels and slow receding waters.

Flash Flood

Floods that occur and recede within less than 6 hours due to localised heavy rainfall.

Coastal Flood

Floods caused by heavy rainfall and rising sea levels during high tide that exceed riverbanks.

Stagnant Flood

Floods that occur in low-lying areas where water cannot drain away and remains stagnant for an extended period.

Flood Phenomena in Penang

Penang frequently faces significant challenges due to flood phenomena, especially during the Northeast Monsoon season. The high tide phenomenon that occurred between 18th and 21st October 2024, for instance, increased the risk of flash floods in coastal areas and major rivers. Heavy rainfall coinciding with the high tide caused sea and river levels to rise rapidly, leading to water overflow and subsequent flooding.

Floods in Penang not only affect infrastructure and property but also have a significant impact on residents' lives, particularly vulnerable groups such as the elderly, children, women, PWD, and migrant workers. Therefore, effective preparedness (readiness), mitigation (risk reduction), and resilience (recovery and adaptation) measures are crucial to reducing the risks and impacts of these disasters.

One of the flood-affected areas in Bayan Lepas, 2022
(Photo by ADUN PH N38 Bayan Lepas)

Importance of Flood Management

Flood management is crucial for protecting lives and property from flood events. With the increasing impact of climate change and the expectation of more frequent floods, proactive and comprehensive flood management measures are essential to ensure community safety.

The key objectives of flood management include:

Reducing the risk of property damage

Good flood management can reduce damage to homes, buildings and public infrastructure.

Protecting lives

Preparedness and effective response measures can save lives, especially those of vulnerable groups.

Minimising economic disruption

Floods can cause significant disruption to economic activities. Good flood management can help ensure business continuity and job security.

Increasing community awareness and education

Educational and training programmes on flood management can enhance community awareness and preparedness in facing disasters.

Preserving the environment

Effective flood management also involves measures to preserve natural ecosystems and reduce negative impacts on the environment.

3

Causes and Risks of Flood

Causes of Floods

Flood Risks

Vulnerable Groups During Floods

Causes of Floods

Flood disasters are triggered by several factors, which can be categorised as natural or human-made causes.

Natural Factors

Natural factors that cause flood disasters include heavy rainfall, high tides, the size of river basins/drainage areas, low-lying terrain, and the presence of storm lines. Flood disasters can also occur when river flow exceeds normal capacity due to intense rainfall, either upstream or in specific localised areas. When the existing river system cannot accommodate the excess water, it overflows and floods the surrounding areas. Characteristics of rainfall that contribute to flooding include intensity, frequency, duration, and total volume.

Human-made Factors

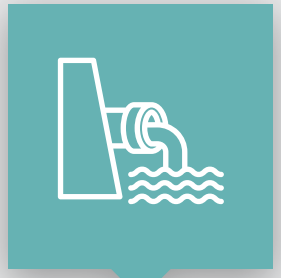
Human factors contributing to floods include the development of catchment areas or floodplains, inadequate drainage infrastructure, and lack of maintenance of drainage systems. Additionally, dam failures, uncontrolled water releases, and rapid urbanisation play significant roles. Development can disrupt ecosystems, reduce interception processes, and cause soil saturation, leading to flooding. Urban development increases built-up areas, which prevents water from infiltrating the soil through natural infiltration and percolation processes, reducing groundwater recharge. This situation is further exacerbated by inadequate drainage infrastructure and poor maintenance of drainage systems, as well as water releases or dam failures.

Natural Factors

High Tides

Terrain Conditions

Heavy Rainfall

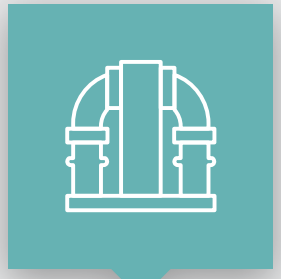


Size of River Basins/
Drainage Areas

Storm
Lines

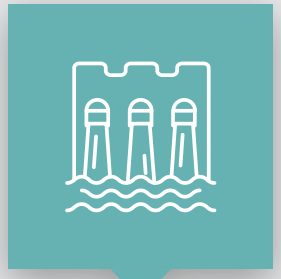
Human-made Factors

Area
Development



Inadequate Drainage
Infrastructure

Lack of Maintenance
of Drainage Systems



Water Releases/
Dam Failures

Increase in Urban
Built-Up Areas

Flood Risks

Flood disasters have diverse impacts on humans, infrastructure, and the environment.

Safety Risks

Drowning

Floods can create dangerous swift currents, increasing the risk of drowning, especially for those who cannot swim or are trapped in deep water.

Injuries and Infections

Floodwater often carries debris and sharp objects that can cause cuts and injuries. Open wounds exposed to floodwater are at high risk of infection.

Hypothermia

Prolonged exposure to cold floodwater without adequate protection can lead to hypothermia, where the body temperature drops to dangerous levels.

Electric Shock

Submerged electrical equipment and cables can cause fatal electric shocks.

Waterborne Diseases

If waterborne diseases are not addressed promptly, they can pose serious safety risks, including severe health complications such as dehydration and malnutrition, poor hygiene, and increased risk of food contamination.

Economic Risks

Property and Infrastructure Damage

Floods can cause extensive damage to homes, buildings, roads, bridges, and other infrastructure, leading to substantial financial losses.

Agriculture and Business Losses

Floods devastate crops and farmland, resulting in significant losses for farmers. Businesses can also suffer due to damage to premises and interruptions in operations, leading to economic hardship and potential job losses.

Economy Risks

Energy Supply Disruption

Floods can damage power stations and electrical lines, leading to widespread power outages that disrupt daily life.

Food Supply Shortages

Flood damage to crops and farmland can lead to food shortages and price increases, affecting economic stability.

Health Risks

Waterborne Diseases

Diseases such as leptospirosis, cholera, and hepatitis A can spread through contaminated floodwater, leading to serious outbreaks.

Sanitation Issues

Overflowing sewage systems due to flooding can cause sanitation problems, increasing the risk of waterborne diseases.

Psychological Effects

Flood victims may experience psychological stress, anxiety, and trauma due to loss of property, displacement, and uncertainty about the future.

Social Risks

Mass Displacement of Residents

Flooding forces residents to relocate from their homes, causing social and logistical difficulties.

Educational Disruption Due to School Closures

School closures due to flooding can disrupt students' learning processes and negatively impact their education.

Social and Psychological Hardships

Displacement and loss of property can lead to social and psychological difficulties for flood victims, including stress and depression.

Ecosystem Risks

Damage to Natural Habitats

Flooding can damage natural habitats, disrupt flora and fauna, and lead to a loss of biodiversity.

Changes to Ecosystems

Flooding can disturb vegetation and animal life, causing significant changes to ecosystems.

Transportation Risks

Disruption of Transportation and Logistics Systems

Flooding can submerge roads, disrupting transportation and logistics systems, and making movement and delivery of goods difficult.

Vulnerable Groups During Floods

Vulnerable groups, also known as high-risk groups, consist of individuals or communities that are less capable of protecting themselves from various forms of risks and challenges. This includes children, the elderly, women, persons with disabilities (PWD), and migrant workers.

Children

Children often lack awareness of flood-related risks and may face physical limitations that hinder independent evacuation. Residents in flood-prone areas with inadequate safety measures put them at higher risk of injury or even drowning.

Women

Women often bear additional responsibilities, such as caring for children and family members, which may limit their ability to acquire disaster preparedness skills and knowledge.

Elderly

Declining physical strength, health issues, and the possibility of living alone can hinder the elderly's ability to receive timely assistance. They also often live in houses that are not adapted to their mobility needs, such as houses without ramps or accessible exits. This makes evacuation difficult and increases the likelihood of injury during floods.

Persons with Disabilities (PWD)

Persons with disabilities may face mobility challenges due to sensory limitations and communication challenges, making them reliant on external assistance during evacuation and for ensuring safety. They also face challenges as many houses lack essential features such as wheelchair access or accessible evacuation routes. Floodwaters can also damage assistive devices, further compromising their ability to evacuate safely.

Migrant Workers

Migrant workers may face language barriers that limit their understanding of emergency warnings and instructions. Additionally, they often live or work in disaster-prone areas, increasing their vulnerability.

4

Flood Resilience

Adapting with Floods

Technology for Disaster Forecasting and Early Warning

Flood Preparedness

Roles and Responsibilities of Agencies and Community Leaders in Flood Situations

Flood Emergency Contact Numbers

Emergency Evacuation Routes

Nature-based Solutions for Flood Adaptation

Adapting with Floods

Advanced disaster forecasting and early warning technologies, including weather monitoring systems and hydrological sensors, are critical in the detection of floods and the timely issuance of alerts to affected communities. Effective flood preparedness involves the development of comprehensive emergency response plans, and the implementation of community training programmes help to mitigate risks and enhance resilience.

Furthermore, nature-based solutions, such as floodplain conservation, provide sustainable flood mitigation strategies, reducing flood risks while concurrently preserving vital ecosystems.

Technology for Disaster Forecasting and Early Warning

Technology plays a crucial role in enhancing community preparedness for floods. In Malaysia, applications such as **MyPublic InfoBanjir** and **myCuaca** have been developed to provide real-time updates on weather conditions and flood situations. Additionally, the State Government of Penang has developed an online disaster warning system, Penang Alert, to enhance public awareness and preparedness for disaster risks.

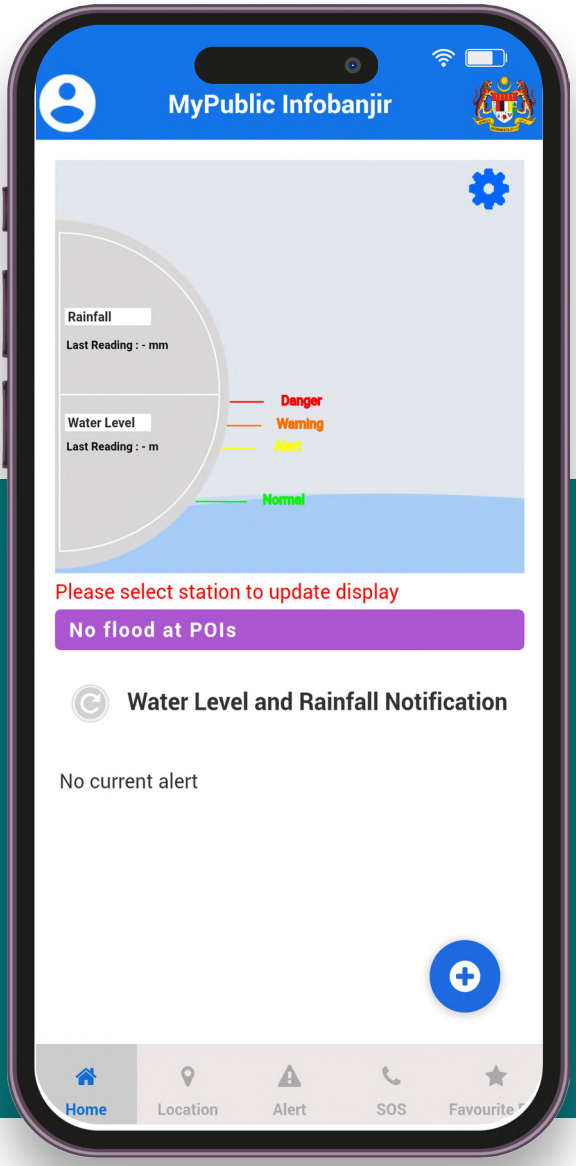
1 MyPublic InfoBanjir

This application is developed by the Department of Irrigation and Drainage Malaysia (JPS) to assist the public in preparing for floods and taking precautionary measures. Additionally, it also supports authorities in managing flood situations effectively.

Scan to download the application:

Apple App Store

Google Play Store



The key features of MyPublic InfoBanjir include:

Real-time River Water Levels	Users can monitor water levels in various locations, categorised as danger, warning, alert or normal.
Interactive Map	Displays as an interactive map that shows water levels at 337 locations nationwide.
Instant Notifications	Users are able to access weather warnings, and official announcements related to flood information.
Live Data Access	Users can obtain up-to-date information on rainfall and river water levels location.

Technology for Disaster Forecasting and Early Warning

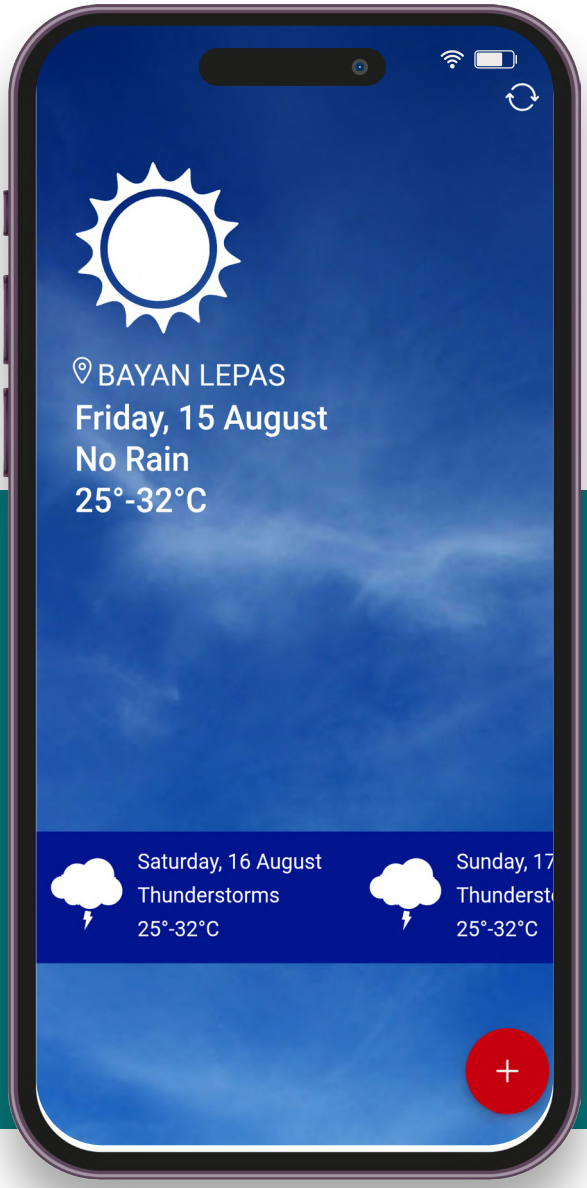
2 myCuaca

This application is developed by the Malaysian Meteorological Department (MET Malaysia) and aims to provide the latest weather forecasts, including warnings of heavy rain that could potentially cause flooding.

Scan to download the application:

Apple App Store

Google Play Store



The key features of myCuaca include:

Daily and Weekly Weather Forecasts	Users can access daily and weekly weather predictions for specific locations.
Early Warnings	This application provides alerts on severe weather conditions such as thunderstorms, heavy rain, and strong winds.
Real-Time Weather Conditions	Users can obtain current weather conditions including temperature, humidity, and wind speed.
Interactive Weather Map	This application provides interactive map that shows the overview of weather conditions nationwide.

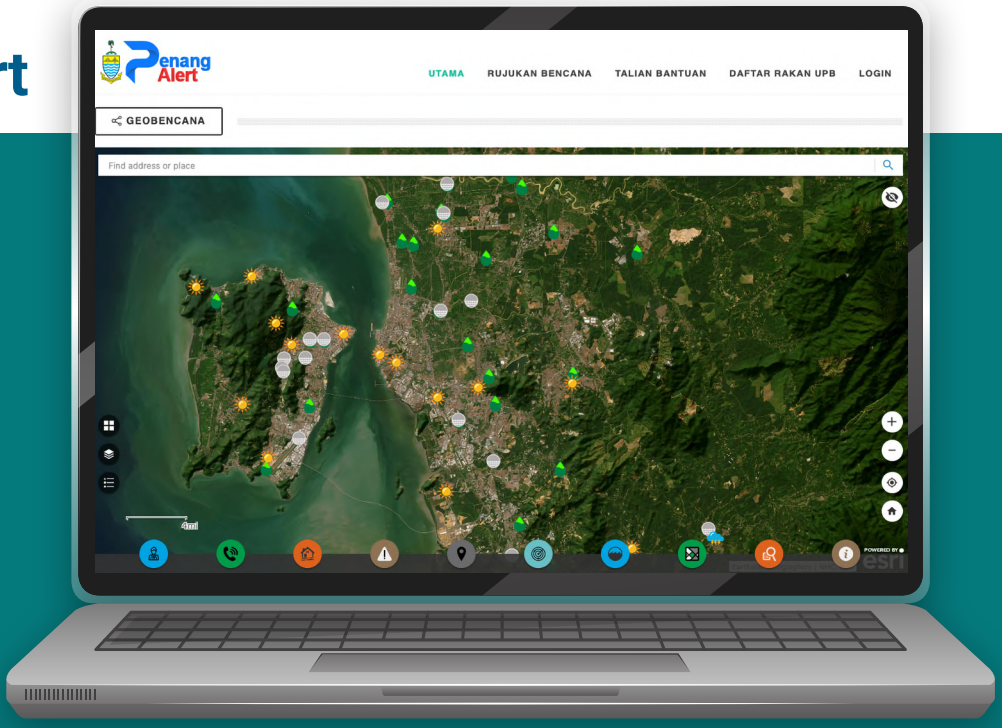
Technology for Disaster Forecasting and Early Warning

Click to access the link:

https://alert.penang.gov.my

3 Penang Alert

This online disaster warning system was developed by the State Government of Penang to provide early warnings and information about disasters and major incidents, such as floods, landslides, and road closures.



The key features of Penang Alert include:

Interactive Map	Provides an interactive map showing the weather conditions across Penang.
Disaster Reference	Provides reference information on the locations of temporary evacuation centre and details of government agencies responsible for disaster management.
Hotline	Lists the hotline numbers for rescue agencies and emergency services in Penang.
Latest Notification	Provides information about extreme weather warnings, disaster forecasts, and disaster-related announcements.

Flood Preparedness

Preventive measures and flood preparedness are crucial in minimising risks and mitigating potential adverse impacts. The following are key actions that communities can take to enhance their readiness for floods:

Pre-Flood Event + **During Flood Event** + **Post-Flood Event**

Members of the APM (Malaysian Civil Defence Force) in Penang are preparing for the monsoon transition.

Flood Preparedness

Pre-Flood Event

1. 

Monitor news updates, weather conditions, and official warnings, especially if you live in a high-risk flood area.

2. 

Prepare emergency supplies.

3. 

Identify the nearest flood warning siren and stay alert to the warning sounds being emitted.

4. 

Ensure all family members understand the necessary actions to take during an emergency.

5. 

Know the location of the nearest Temporary Evacuation Centre (PPS) and plan a safe evacuation route.

6. 

Park vehicles in elevated areas to prevent flood damage.

7. 

Pack an emergency bag containing important documents, medications, a flashlight, and other essential items.

8. 

Store an adequate supply of clean water and nonperishable food for emergency use.

9. 

Turn off electrical switches, main water valves, and gas lines before evacuating to prevent hazards.

Flood Preparedness

During Flood Event

1. 

Do not return home without official clearance.

2. 

Avoid contact with electrical appliances.

3. 

Stay updated on flood conditions.

4. 

Supervise children and avoid floodwater contact.

5. 

Consume only safe drinking water.

6. 

Evacuate immediately if necessary.

Post-Flood Event

1. 

Stay away from exposed or fallen power lines.

2. 

Do not consume contaminated food.

3. 

Avoid direct contact with floodwater.

4. 

Inspect septic tanks for damage to prevent biological hazards.

5. 

Return home only when declared safe.

Roles and Responsibilities of Agencies and Community Leaders During Flood

The National Disaster Management Agency (NADMA) serves as the lead agency in national disaster management. It is responsible for coordinating disaster response efforts, formulating policies and mechanisms, and ensuring compliance with disaster management regulations at all levels. *Arahan NADMA No.1* clearly defines the roles and responsibilities of agencies and community leaders during floods to ensure the safety and well-being of affected communities.

Search and Rescue (SAR) Services

Roles

- Searching and rescuing victims

Agency

- Malaysian Special Search and Rescue Team (SMART)
- Fire and Rescue Department of Malaysia (JBPM)
- Royal Malaysia Police (PDRM)
- Malaysian Armed Forces (ATM)
- Malaysian Civil Defence Force (APM)
- Malaysian Maritime Enforcement Agency (APMM)
- Other Authorised Agencies

Media

Roles

- Press coverage
- Electronic media coverage
- Media control

Agency

- Information Department
- Broadcasting Department

Welfare

Roles

- Transferring victims
- Providing food for victims/staff
- Preparing/managing evacuation centre
- Providing first aid and counselling services

Agency

- Social Welfare Department (JKM)
- Ministry of Health Malaysia (KKM)
- Malaysian Civil Defence Force (APM)
- Malaysian Red Crescent Society (MRCS)
- Malaysian Volunteer Department (RELA)
- Ministry of Tourism, Arts, and Culture Malaysia (MOTAC)
- Other Authorised Agencies

Health and Medical Services

Roles

- Managing emergency treatment
- Managing forensic services
- Managing public health

Agency

- Ministry of Health Malaysia (KKM)
- Malaysian Armed Forces (ATM)
- Malaysian Red Crescent Society (MRCS)
- Malaysian Civil Defence Force (APM)
- Other Authorised Agencies

Support

Roles

- Assisting in terms of logistics, communication, and other support to facilitate the operations of controlling and addressing the disaster

Agency

- District/Municipal Council
- Tenaga Nasional Berhad (TNB)
- Telekom Malaysia Berhad (TM)
- Malaysian Armed Forces (ATM)
- Royal Malaysian Police (PDRM)
- Public Works Department (JKR)
- Ministry of Domestic Trade and Consumer Affairs (KPDNHEP)
- Department of Veterinary Services (DVS)
- Other Authorised Agencies

Security Control

Roles

- Establishing control at the scene
- Conducting investigations
- Facilitating communication

Agency

- Royal Malaysia Police (PDRM)
- Malaysian Volunteer Department (RELA)

Flood Emergency Contact Numbers

Fire and Rescue Department of Malaysia (JBPM) Pulau Pinang	04-5047222
Penang Royal Malaysia Police (PDRM)	04-2221522
Hospital Pulau Pinang	04-2225333
Malaysian Civil Defence Force (APM) Pulau Pinang	04-2297804
Social Welfare Department (JKM) Pulau Pinang	04-6505259
Disaster Operations Control Centre (PKOB) Pulau Pinang	04-2621819 / 04-2621207
Northeast District and Land Office	04-6505382 / 04-8664695
Southwest District and Land Office	04-866 4695

Emergency Evacuation Routes

Important guidelines for developing an effective evacuation plan include:

ASSEMBLY POINTS	Establish several safe assembly points in areas on higher ground such as schools or community halls.
EVACUATION ROUTES	Identify safe evacuation routes that are not affected by floods, such as elevated main roads or bridges.
COMMUNICATION CENTRE	Set up a communication centre at the temporary shelter to disseminate the latest information and instructions from authorities.
EVACUATION DRILLS	Conduct regular evacuation drills to ensure all residents know what to do during a flood.

Emergency evacuation routes during floods are crucial to ensure the safety of all local communities in affected areas. These routes must be carefully designed and maintained for quick and safe use during a flood.

Nature-based Solutions for Flood Adaptation

Nature has the ability to help reduce flood risks when its elements are well-protected and conserved. Nature-based Solutions (NbS) in urban areas involve using natural elements to manage water effectively and reduce flood risks.

Image Courtesy:
Jabatan Pengairan dan Saliran Negeri Pulau Pinang

In cities, NbS involves measures such as constructing green roofs, rain gardens, and permeable turf, which allow rainwater to infiltrate the ground. Green spaces, such as public parks and tree planting, also help reduce surface runoff into drainage systems. NbS helps prevent water stagnation, minimise flash flood impacts, and enhance urban quality of life by providing green spaces that support biodiversity.

***Image Courtesy*:**
Jabatan Pengairan dan Saliran Negeri Pulau Pinang

5

Trainer Guide

Module 1: Identify Vulnerable Groups

Module 2: Early Warning Technology for Disasters

Module 3: Flood Preparedness Actions

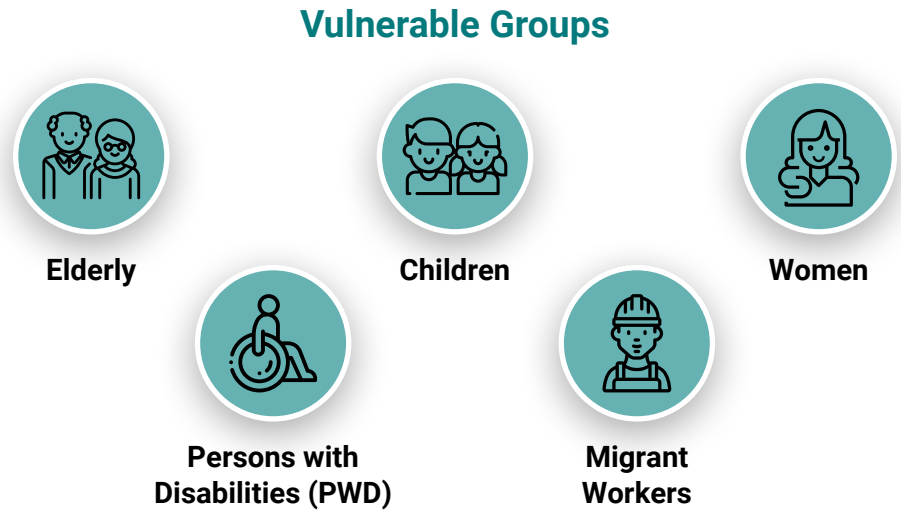
Module 4: Flood Evacuation Routes

Flood Preparedness Trainer Guide

Module 1

Identify Vulnerable Groups

- Explain the definition of floods, types of floods, and factors contributing to flood occurrences.
- Identify high-risk groups during floods.



Activity	• Prepare a table for participants to identify vulnerable groups in their households or neighbourhoods. The groups to be identified are the elderly, children, women, persons with disabilities (PWD), and migrant workers.
Practical	• Request participants to complete the Vulnerable Groups Table by identifying individuals in their households or neighbourhoods. • Participants should then discuss the necessary measures to support these vulnerable groups during a flood.

Module 1

Identify Vulnerable Groups

High-risk Groups During Floods	Who?
Elderly Age-related physiological changes, such as reduced mobility and physical strength, make it challenging for individuals to move quickly or access help.	
Children Children, especially infants, are highly vulnerable during floods as they lack an understanding of the dangers and have physical limitations that make it difficult for them to escape or seek help on their own.	
Women Women often bear additional responsibilities, such as caring for children and other family members. This means they are less involved in skills and knowledge related to disaster preparedness, which makes them more vulnerable during floods.	
Persons with Disabilities (PWD) Individuals with disabilities face additional challenges during floods due to their physical or mental limitations. They may require extra assistance to move to a safe location and access the help they need.	
Migrant Workers Migrant workers face language barriers that make it difficult for them to understand warnings or emergency instructions. Additionally, their living or working locations are often situated in areas that are vulnerable to disasters, which increases their risk during floods.	

Module 2

Early Warning Technology for Disasters

This module introduces modern technologies for weather monitoring, river water level tracking, and early flood warning systems. This technology includes applications such as MyPublic InfoBanjir and myCuaca, which assist in flood risk management.

Activity	• Prepare a Vulnerable Groups Table for each participant. The groups to be identified are the elderly, children, women, persons with disabilities (PWD), and migrant workers.
Practical	• Conduct a demonstration to download the apps for this activity. • Require the participants to download the apps for this activity.

1 Access real-time information

MyPublic InfoBanjir

myCuaca

2 Application usage training

- Open the application and register an account if required.
- Navigate through the main menu to familiarise the available features.
- Use the interactive map to identify your area and view river water levels or weather forecasts.
- Set up alert notifications to receive real-time updates on floods or extreme weather conditions.

3 Flood simulation

Scenario 1	Scenario 2
Participants will be asked to retrieve information about river water levels in their area using the MyPublic InfoBanjir application.	They will use the myCuaca application to check weather forecasts and set up notifications for extreme weather alerts.

Module 3

Flood Preparedness Actions

This module helps communities prepare for floods by providing essential tools and guidelines for immediate action during flood emergencies.

Contents of Grab Bag

Important Documents

Personal Items

Medical Supplies

Food and Water Supply

Torchlight & Extra Batteries

Communication Equipment

Activity	• Prepare a checklist for the Grab Bag and distribute it to each participant.
Practical	• Request participants to indicate the items they typically carry during a flood. • Facilitate a discussion on the importance of each of these items.

Module 3

Flood Preparedness Actions

Tick ✓ if you bring the essentials below:

	Cash Money	**Personal Items**
	Toiletries	
	Clothes	
	Essential Item for Infants and Women (e.g., baby supplies, sanitary products)	
	Car Keys	
	House Keys	
	Mobile Phone and Powerbank	**Communication Equipment**
	Whistle	
	Canned Food and Mineral Water	**Food and Water Supply**
	Personal Medications	**Medical Supplies**
	Identification Card	**Important Documents**
	Land Grant	
	Car Grant	
	Education Certificates	
	Torchlight	**Torchlight & Extra Batteries**

Module 4

Flood Evacuation Routes

This module is designed to ensure the safety of all residents in flood-affected areas. Well-planned and carefully maintained evacuation routes can be accessed quickly and safely during emergencies, reducing the risk of injury and loss of life during a flood disaster. Effective management of evacuation routes is crucial to ensure that communities are better prepared and resilient in facing the challenges posed by climate change and flood disasters.

Practical

- Steps in Designing Flood Evacuation Routes

1 Flood Risk Mapping

- Identify high-risk flood areas based on historical data and topographical analysis.
- Use flood risk maps to determine areas that need to be evacuated.

2 Evacuation Route Determination

- Design the safest and quickest evacuation routes from high-risk areas to safe shelters on the flood evacuation plan.
- Ensure these routes are obstacle-free and accessible to everyone, including persons with disabilities (PWD).

3 Shelter Preparation

- Set up safe shelters equipped with basic necessities such as food, clean water, and medical supplies.
- Ensure these shelters are easily accessible via the designated evacuation routes.

4 Training and Drill

- Conduct regular evacuation drills and simulations to ensure all residents know what actions to take during a flood.
- Involve all community sectors, including local leaders, volunteers, and vulnerable groups, in these exercises to enhance awareness and preparedness.

Module 4

Flood Evacuation Routes

DATE	TIME	LOCATION	WEATHER

Flood Evacuation Plan

Insert map of site area here

N

Legend

- Evacuation Route
- Safe Zone/Relocation Centre
- First Aid Station
- Flood Hazard Area
- Emergency Contact Point

NOTE:

6

References

References

Agensi Pengurusan Bencana Negara. (2024). Arahan NADMA No. 1: Dasar dan mekanisme pengurusan bencana negara.

Amir Zal, W. A. (2018). Ketahanan komuniti mangsa bencana banjir di pantai timur semenanjung Malaysia dalam konteks modal komuniti [Community resilience among flood victims in the east coast of peninsular Malaysia in the context of community capitals]. Journal of Nusantara Studies, 3(2), 41–53. https://doi.org/10.24200/jonus.vol3iss2pp41-53

Majlis Keselamatan Negara (MKN). (2022, 12 Mac). Akibat banjir: Ini kesan yang perlu anda tahu. Laman web MKN. https://www.mkn.gov.my/web/ms/2022/03/12/31179/

National Disaster Management Agency (NADMA). (n.d.). Senarai nombor pejabat daerah. Retrieved February 20, 2025, from https://portalbencana.nadma.gov.my/images/ndcc/documents/PKOB/SENARAI_NOMBOR_PEJABAT_DAERAH.pdf

Paimin, Sukresno, & Irfan Budi Pramono. (2009). Teknik mitigasi banjir dan tanah longsor. Tropenbos International Indonesia Programme.

Penang Alert. (n.d.). Bantuan. Retrieved February 20, 2025, from https://alert.penang.gov.my/bantuan.php

Selangor Water Department. (n.d.). Pengurusan Banjir. Retrieved October 8, 2024, from https://water.selangor.gov.my/info/fungsi/pengurusan-banjir

Temrin, S. N., & Awang, A. (2017). Bencana banjir dan tahap pengetahuan penduduk terhadap pengurusan banjir di Serian, Sarawak. Malaysian Journal of Society and Space, 13(4), 22–36. https://journalarticle.ukm.my/12570/

PNBCAP

Penang Nature-based Climate Adaptation Programme

Toolkit Development Partners

thinkCITY

Making Cities Liveable, Together.

JABATAN KESIHATAN NEGERI PULAU PINANG

aurecon