ICHARM 20th Anniversary Symposium
Reducing water-related disaster risk to build a sustainable society

17th June 2026

GRIPS, Tokyo, Japan

From **Catastrophic Flood** to **Future Resilience**

Lessons Learned from the 2025 Hat Yai Flood

and Thailand–JICA Collaboration

Kittisak Pitakwong

Director of River Basin Management Sub-Division 4

River Basin Management Division

Office of the National Water Resources, Thailand

12

2011 FLOOD
A Turning Point

The devastating **2011 flood** caused tremendous loss of life, wide-ranging damage, and severe impacts on the economy and society.
It became the **catalyst** for Thailand's water governance reform.

THAILAND'S WATER GOVERNANCE FRAMEWORK

Principle of the National Water Resources Management

This reform resulted in three key pillars:

Pillar 01

THE WATER RESOURCES ACT

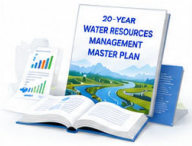
Provides the legal foundation for integrated development, management, and conservation of water resources.

Pillar 02

THE ESTABLISHMENT OF THE WATER RESOURCES MANAGEMENT ORGANIZATION

An integrated agency responsible for national water resources management and coordination across all sectors.

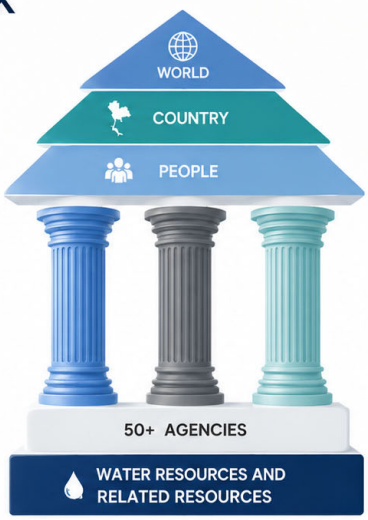
Pillar 03



THE 20-YEAR WATER RESOURCES MANAGEMENT MASTER PLAN

A long-term strategic plan to ensure water security, sustainability, and resilience for the future.

- The National Water Resources Committee
- The River Basin Committee
- The Water User Organization



Page 13

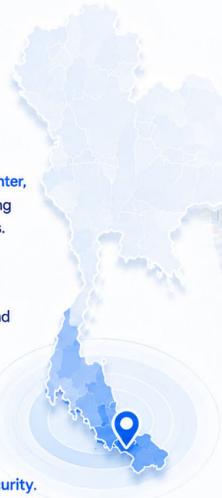
WHY HAT YAI MATTERS

Hat Yai is the largest economic center in Southern Thailand.

It serves as a transportation hub, tourism destination, educational center, and commercial gateway connecting Thailand with neighboring countries.

Therefore, when severe flooding occurs in Hat Yai, the impacts extend far beyond the city itself and affect the entire southern region.

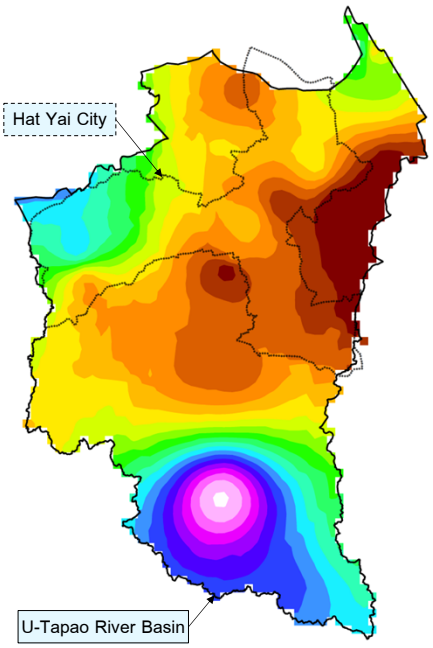
Protecting Hat Yai is therefore not only a local issue but also a matter of national economic security.

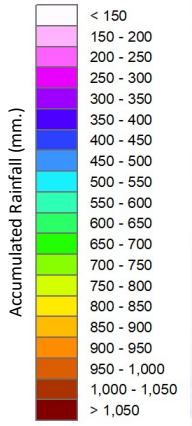


THE 2025 HAT YAI FLOOD EVENT

Accumulated Rainfall

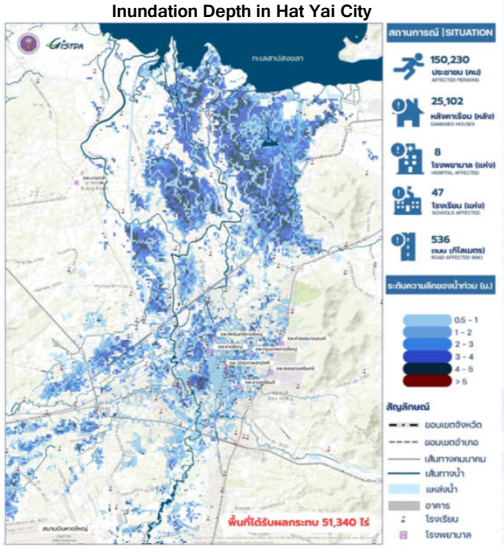
20 – 28 Nov 2025





THE 2025 HAT YAI FLOOD EVENT

Satellite Model from Sentinel-1A on 24 November 2025
Inundation Depth in Hat Yai City



Inundation areas : 82.14 SQ.KM

JICA Support and Technical Cooperation

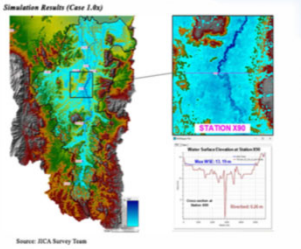
Site visit & Seminar

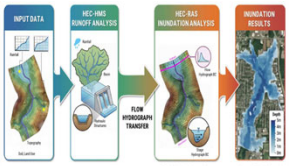
A field survey across 14 locations in the U-Tapao River Basin was conducted to assess the area and propose comprehensive water management recommendations. Following this, a knowledge-sharing seminar was held to present lessons learned from the Hat Yai floods and to formulate long-term policy guidelines for effective flood mitigation in Thailand.

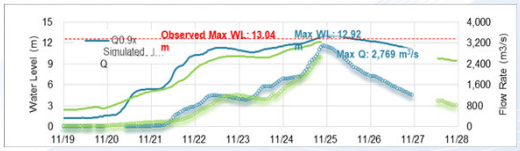
Advanced modeling tools

Category	Item	Description (Source)
Simulation	Period	11/17 00:00 – 11/28 00:00 (11 days)
Input Data	Rainfall	10 Rainfall Stations (TMD & RID)
	Topography	5m x 5m DEM (LDD 2002)
Model Settings	Loss Method	SCS CN, Global 250m CN (Jaafar et. al)
	Transform Method	Clark Unit Hydrograph
	Routing	Muskingum
Calibration	Method	Peak Discharge and Hydrograph

Category	Item	Description/Source
Simulation	Period	11/19 – 11/27 00:00, 8 days
Input Data	Rainfall	10 Rainfall Stations (TMD & RID)
	Landcover	Land Cover 2020, 10m (Copernicus)
	Topography	5m x 5m DEM (LDD, 2002)
	Curve Number (CN)	GCN250m: Global Hydrologic Curve Number (Jaafar et. Al)
Model Settings	Mesh Size	100m x 100m (30m refinement along river)
	Boundary Condition	Downstream: stage hydrograph (ONE837) Upstream: flow hydrograph (HEC-HMS results)
	Manning's Coefficient	n = 0.035 (channel); others vary by land cover
Calibration	Flood	November 2025 Flood
	Method	Peak water level, Peak discharge and Inundation area/depth

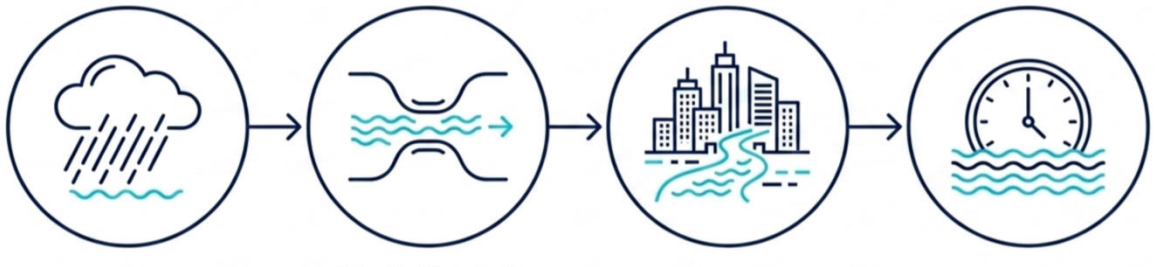






Main Factors Leading to the Crisis

The study identified several key factors contributing to the disaster.



Extreme Rainfall
Heavy rain exceeding normal levels caused massive runoff

Limitations of Waterways
Rivers and drainage systems have limited capacity to accommodate water

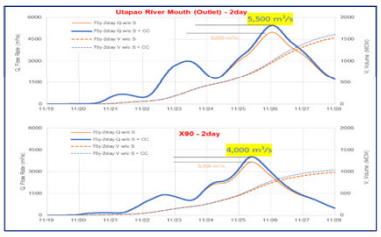
Urban Bottlenecks
Urban expansion obstructs water flow; insufficient flood retention areas

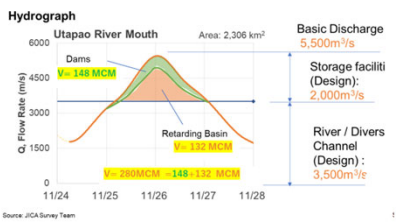
Delayed Drainage
Prolonged urban flooding due to inability to drain water in time

Structural Measures

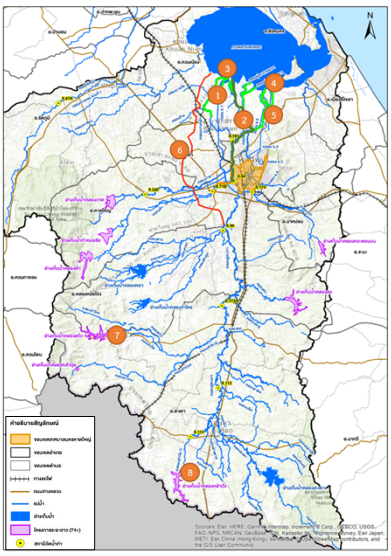
Based on the study, several structural measures have been proposed.

- River Channel Improvement
- Floodways
- Development of Retention Areas and Reservoirs

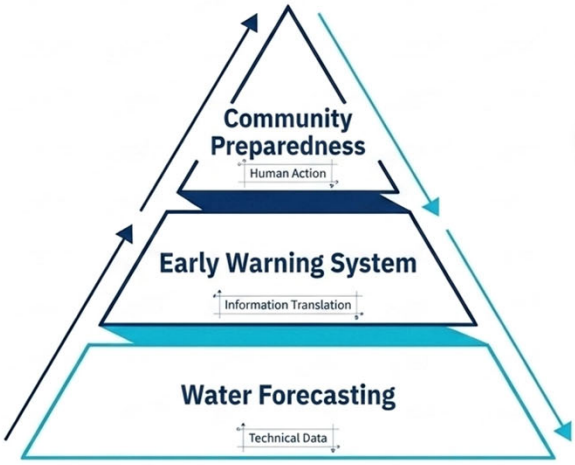




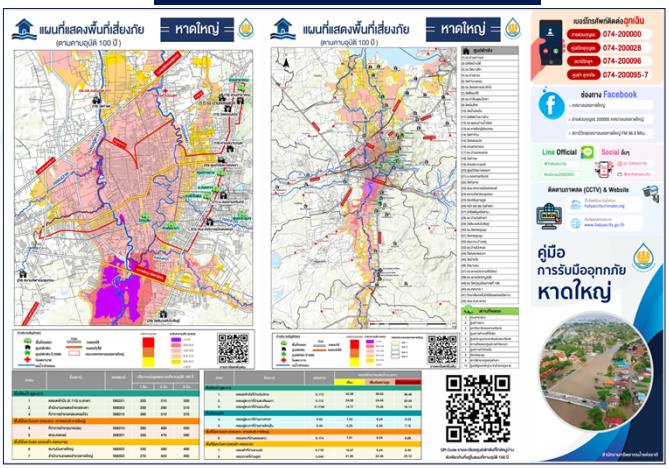
Project plan



Non-Structural Measures

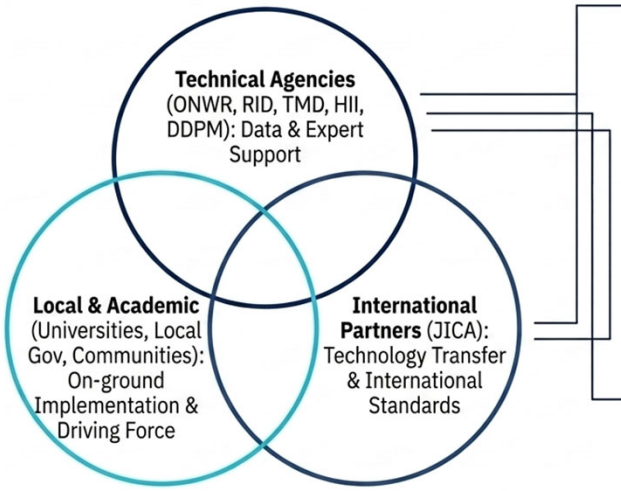


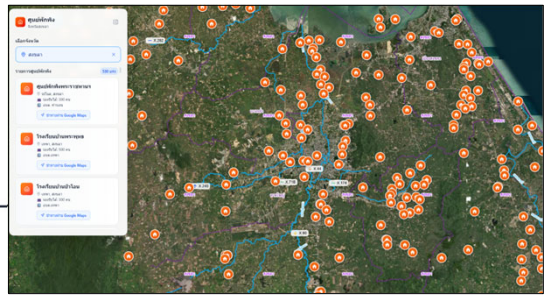
Hat Yai Flood Manual



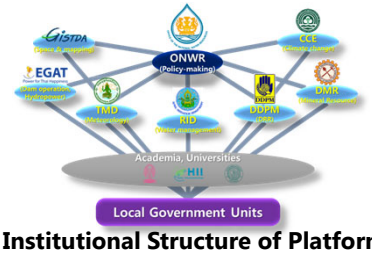
Collaboration Platform

One of the most important lessons from Hat Yai is that no single organization can solve large-scale flood problems alone.





Platform on Water Resilience and Disasters in Thailand



Institutional Structure of Platform

Participating Agencies

- Office of National Water Resources (ONWR)
- Royal Irrigation Department (RID)
- Thai Meteorological Department (TMD)
- Thailand Department of Disaster Prevention & Mitigation (DDPM)
- Department of Mineral Resources (DMR)
- Electricity Generating Authority of Thailand (EGAT)
- Department of Climate Change and the Environment (CCE)
- Geo-Informatics and Space Technology Development Agency (GISTDA)
- Public Relations Department (PRD)
- Hydro-Informatics Institute (HII)
- Chulalongkorn University
- Kasetsart University
- ESCAP
- JICA Thai
- ICHARM

1st Plenary Meeting
March 25, 2024

2nd Plenary Meeting
March 6, 2025

3rd Plenary Meeting
March 24, 2026