Thai Government Response to the 2011 Floods

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What happened in 2011?
Consequences

- 6 months (July, 2011 – Jan, 2012)
- 66 out of 77 provinces
- 13.6 million people affected
- 815 dead
- 7 Industrial estates damaged
Urban Transportation
Distribution of sustenance kits
Pets
Car Parking
Industrial Estates Affected by the Flood
Industrial Estates Affected by the Flood
Disruptions to Automobile Supply Chain
Effects of Flooding

- People
  - Houses
  - Cars
  - Pets

- Flooding
  - Enterprises
  - Transport Infrastructure
  - Manufacturers
  - LSPs
  - Retailers
  - Road
  - Rail
Government Responses

$ 9.6 billion on flood prevention and water management
• Construction of dams, reservoirs, floodways and flood diversion channels
• Dredging canals and waterways
• Cleaning drainage systems and excavation
• Reforestation
• Establishing a data system for water management and warning systems
Canal Dredging Project
Floodway Construction Project
### Key Findings

- Lack of preparedness of people in the affected areas
- Lack of communication and information sharing
- Establish an effective information systems, especially accurate flood forecasts
- Redundant aid provisions on certain areas and vice versa
- Lack of coordination among different actors
- Set up a single command authority.
- Provide centralized information management system
- Industrial estates submerged
- Disruption in manufacturing supply chains
- Build permanent dykes up to 6.5 meters in height around several industrial estates

### Lesson learned

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Flood Monitoring System
Water Level on Roads
River and Canal Levels
Real-time Road Conditions
ระดับโอกาสภัยภัยน้ำท่วมสายทาง
ระดับเต้า
ระดับกลาง
ระดับสูง

Not to Scale
Alternative Route Information
Transportation Infrastructure

Flooding

People

Houses
Cars
Pets

Transport Infrastructure
Road
Rail

Manufacturers
LSPs
Retailers

Enterprises
Road Infrastructure
Flooding on only a segment of the road can disable the network connectivity.
Highway 340 Recovery

• Reclaim Highway 340, a main linkage to the southern part of Thailand

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<td>➢ It was expected that Rama II road, the last main linkage to the south soon to be inundated.</td>
<td>➢ There must be at least one linkage available to avoid complete disruption of transport system.</td>
<td>➢ Recover an already flooded highway as an alternative route at the lowest cost.</td>
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Road Network Vulnerability Project

• Department of Highway, Ministry of Transport
• Initiated in 2014
• Project Duration - 12 months
• Develop Vulnerability Index (VI) and then identify the vulnerable links of the road network

Vulnerability Index (VI)

• Connectivity
• Accessibility
• Economy
Scope of Study

Vulnerability Analysis

GIS

User Interface

Highway Development Policies

GIS

Road Profile

Rainfalls

Flooding Likelihood

Consequences
- Connectivity
- Economy
- Accessibility
Area of Study

- 11 provinces
- 1,323 edges
- 1,023 nodes
ลำดับกลุ่มเส้นทางที่ใช้ทดสอบ

☑️ Vulnerable_Links

ตัวเลขเส้นทางที่ใช้ในการทดสอบสถานการณ์เบื้องต้น
The Challenges remained

- Maintain the momentum of work, interest and commitment in flood management at the top level of government
- Focus too much on flood prevention, while little on flood damage mitigation and relief logistics
  - How to encourage affected people to evacuate
  - How to efficiently manage donated basics and distribute sustenance kits
  - How to provide fast and seamless multi-modal transport
That’s a wrap!