



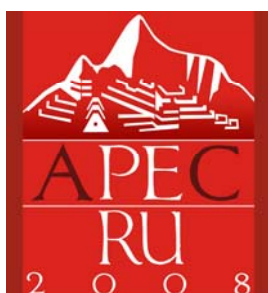
**Asia-Pacific  
Economic Cooperation**

---

**2008/SOM3/TFEP/SEM/006**

**Formulation of the Strategy for Disaster Risk  
Reduction and Emergency Preparedness and  
Response of the Asia-Pacific Region 2009-2015**

Submitted by: Thailand



**Emergency Management CEOs' Forum  
Lima, Peru  
12-14 August 2008**

# Formulation of the Strategy for Disaster Risk Reduction and Emergency Preparedness and Response of the Asia-Pacific Region 2009-2015 Lima, PERU

*Kriengkrai khovadhana*  
Deputy Director-General

THAILAND METEOROLOGICAL DEPARTMENT

## Disaster in Thailand

1. Tropical Storm
2. Earth Quake
3. Flooding
4. Thunderstorm
5. Landslide
6. Storm surge
7. Forest Fire
8. Drought
9. Tsunami



# Tropical Storm



## Supporting Systems

- Satellite
- Radar
- Weather Chart
- NWP model
- Storm track Database
- Assessment risk Area
- Expert experience

## Making Decision

- Briefing and Discussion


**Issue warning**

- Central Government
- Media
- Public
- Relate Agency etc.

# Earthquake

## Seismic Activities of TMD

Thai Seismological Bureau has cooperation with International Seismological agencies



**Pakistan**



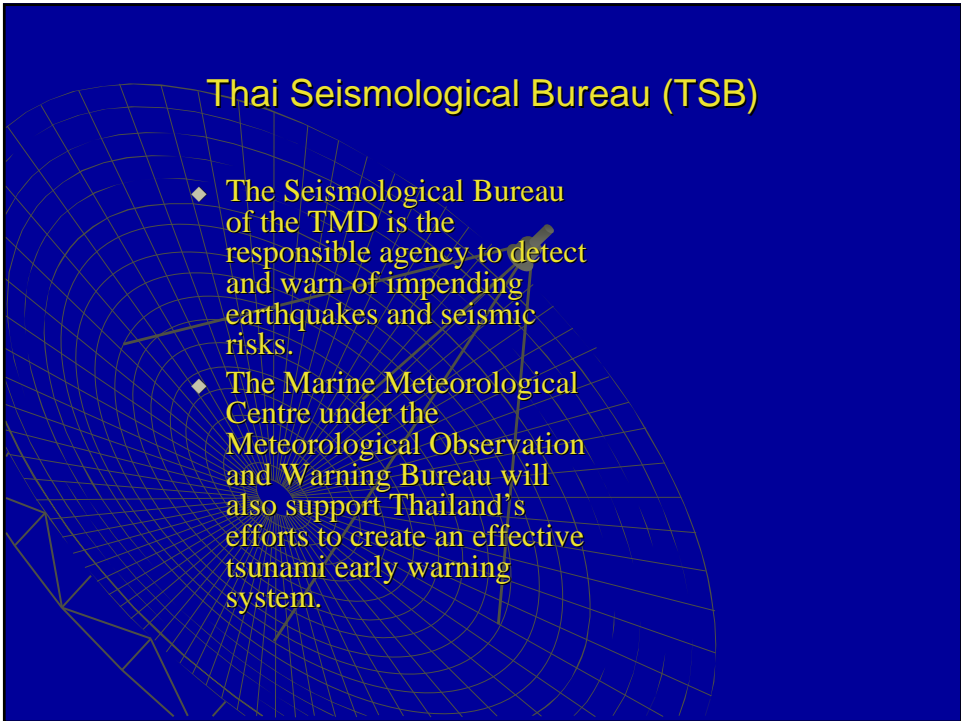
**Chi Chi Earthquake Taiwan**

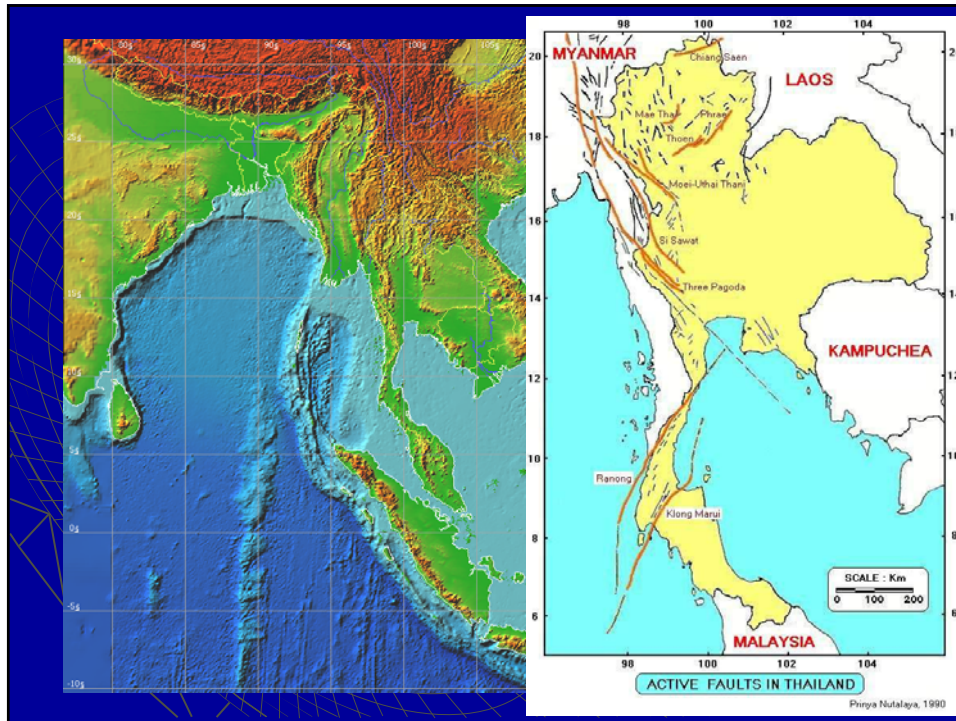


**Kobe Japan**

- 
- ◆ Seismic monitoring with analogue and digital systems.
  - ◆ Center of earthquake information and basic knowledge.
  - ◆ International cooperation with countries such as the United States, Japan and China.
  - ◆ International data exchange through ASNET-RESED, GARNET and USGS.
  - ◆ Policy and planning for installation of the national seismic monitoring network.
  - ◆ Acts as the secretariat for the National Earthquake Committee of Thailand.
  - ◆ Seismological research.

### Thai Seismological Bureau (TSB)

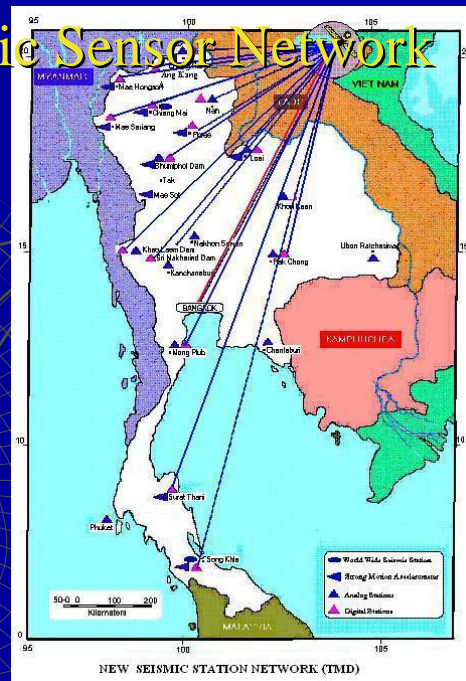
- 
- ◆ The Seismological Bureau of the TMD is the responsible agency to detect and warn of impending earthquakes and seismic risks.
  - ◆ The Marine Meteorological Centre under the Meteorological Observation and Warning Bureau will also support Thailand's efforts to create an effective tsunami early warning system.



## Upgraded Seismic Sensor Network

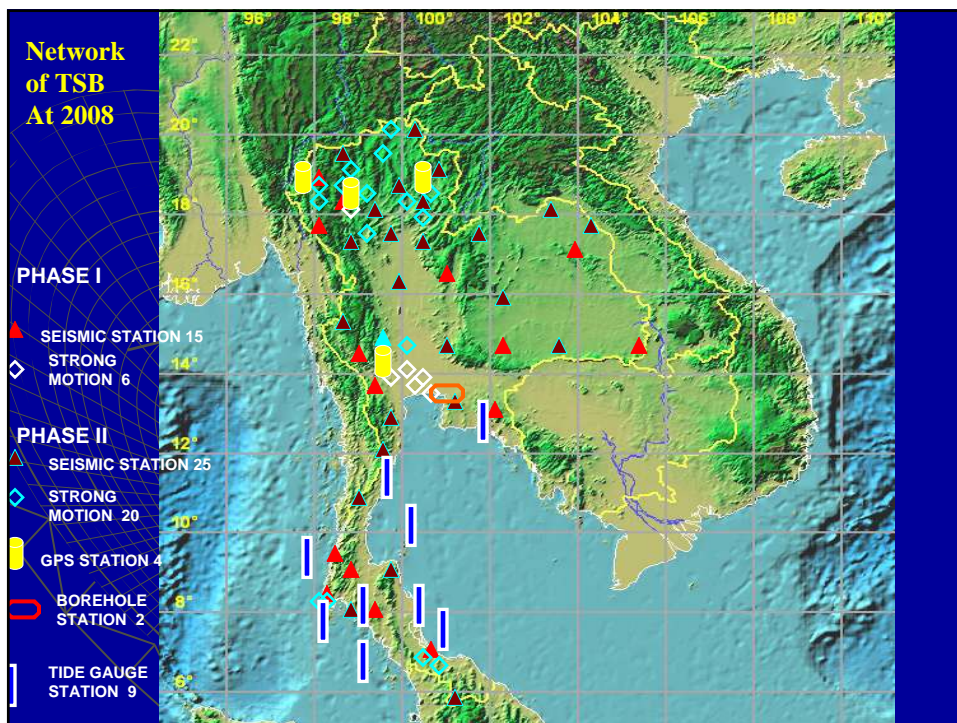
### Phase 1 (2005-2006)

- ◆ Upgrade, re-install and expand network with 4 new stations.
- ◆ 15 Digital Stations in Mae Hong Son (2 stations), Chiang Mai (2 stations), Chiang Rai, Nan, Phrae, Tak, Loie, Nakhon Ratchasima, Khao Leam Dam, Srinakarin Dam, Prachuabkirikhan, Suratthani and Songkhla.
- ◆ Near real time link via VSAT.



## Phase 2 (2006-2008)

- ◆ 25 new digital stations in all part of the country.
- ◆ Near real time link via VSAT.
- ◆ Seismic Database by 2007, which will include data of earthquake events detected by seismometers, active faults, and a seismic risks map.





## Flooding



**Supporting System**

- Tele metering
- Automatic Rain gauge
- River Basin Database
- API  
(Antecedent Precipitation Index)

**Making Decision**

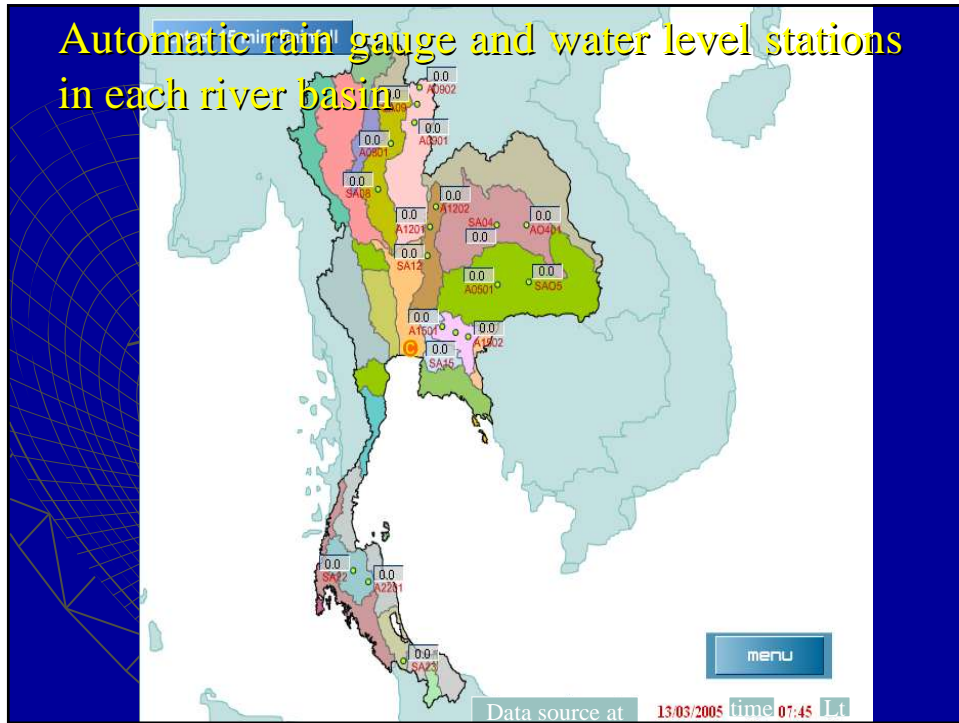
- Weather forecast
- Scenario
- Briefing and Discussion
- Flood forecast



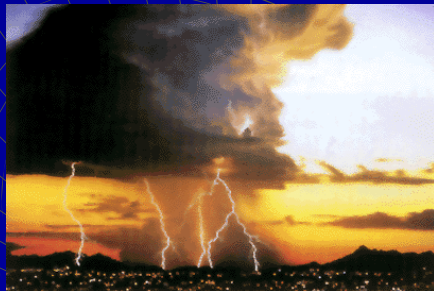
WARNING



## Automatic rain gauge and water level stations in each river basin



## Thunderstorm



### Summer Season

- Cold surge
- Gusty
- Hails

### Rainy Season

- Heavy Rainfalls
- Thunders
- Lightening
- Gusty
- Flash flood

### Supporting System

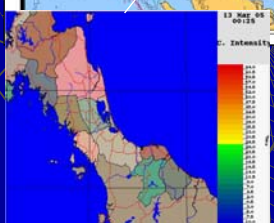
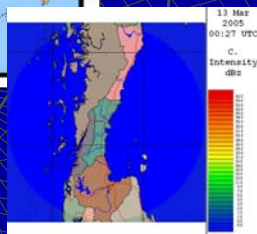
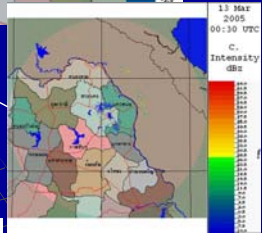
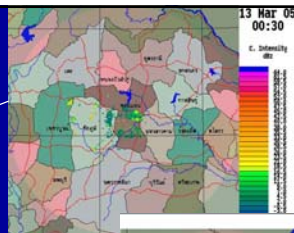
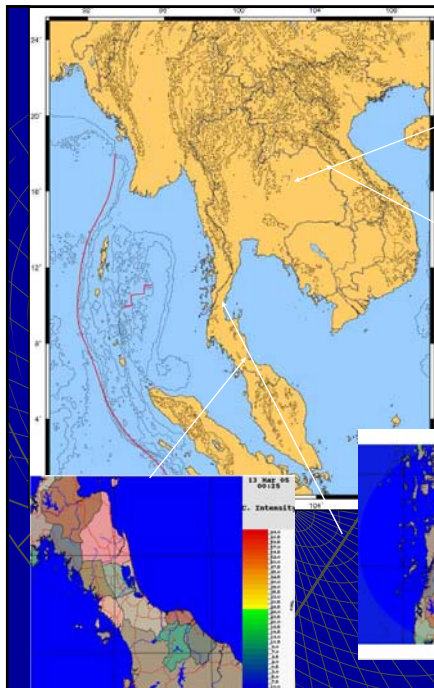
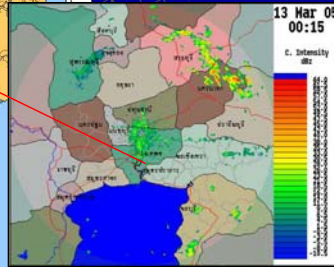
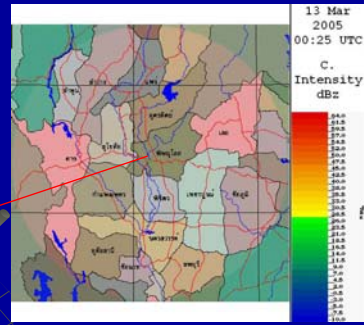
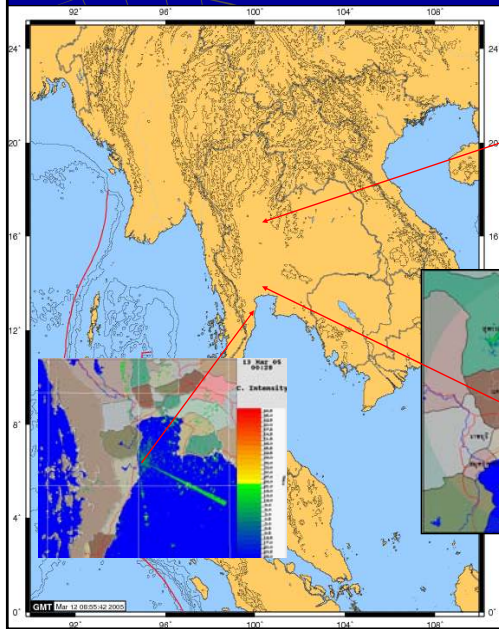
- Weather Map
- NWP model
- Radar
- Satellite

Briefing & Discussion

**WARNING**



# RADAR Network in Thailand



## Landslide



### Supporting system

- Scenario model
- Topography 3D model
- Soil Database
- Land use Database
- Weather prediction
- Soil Moisture Fluxes
- Risk Area
- Expert Experience
- GIS



Briefing &  
Discussion

**WARNING**

## Storm Surge



Mostly happen during  
tropical storm

### Supporting System

- Storm track model
- Weather Map
- Satellite Data
- Radar
- Assessment risk Area
- Expert experience

Briefing &  
Discussion

**WARNING**

# Drought



Monsoon's period in THAILAND

Av. Mid JULY to early August



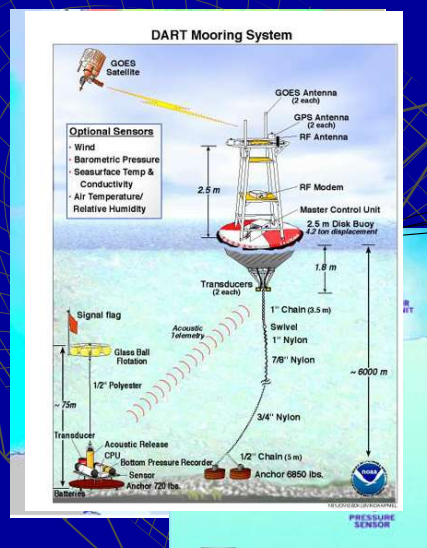
# Effects of the Tsunami in Thailand on 26 Dec 2004



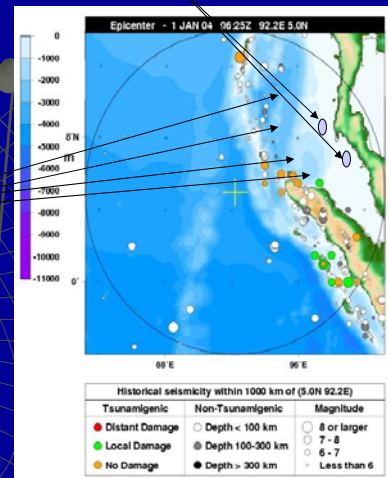
## General information for consideration

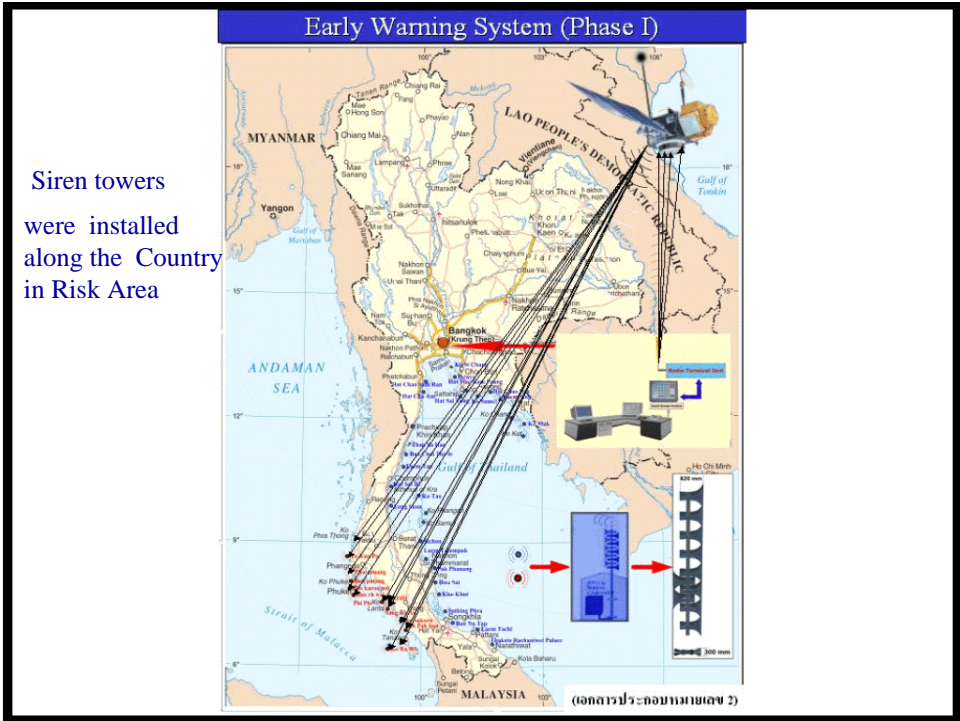
- No historical records of tsunami that effect to Thailand
- No tsunameter and a few old type tidal gauges were installed in the southern region of Thailand
- Never prepare any warning system and evacuation plan for unexpected tsunami phenomenon
- People did not know and realize about basic knowledge of tsunami

## Sensor Buoys

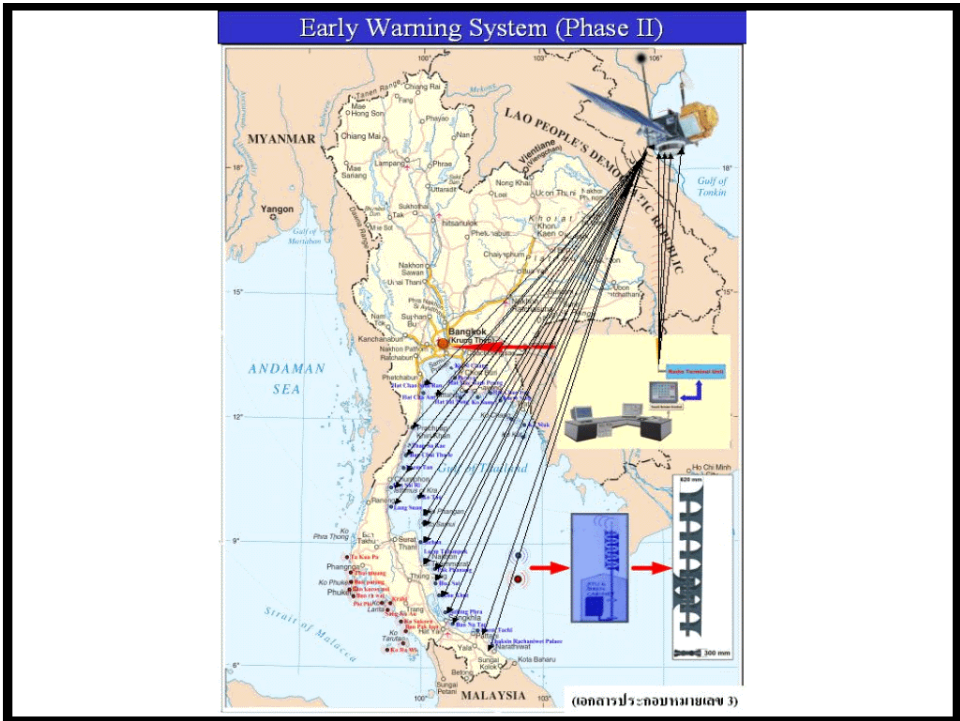


## Tidal Gauges





Siren towers  
were installed  
along the Country  
in Risk Area





## Regional Tsunami Early Warning Centre for the Indian Ocean

- ◆ Enhancing national capacities for tsunami and multi-hazard early warning must be a priority for all governments.
- ◆ However, coordination at the regional and international levels is vital to create a truly effective global system.
- ◆ The Indian Ocean needs a regional focal point to coordinate national efforts and ensure compatibility of systems, in a similar way to existing regional centre such as the PTWC and NWPTIC.
- ◆ Any regional system will need to be linked to a wider global network of local and regional warning systems, which should be coordinated by the IOC of UNESCO and UN-ISDR.
- ◆ Thailand supports the goal of the Asian Disaster Preparedness Centre (ADPC) to be the regional focal point for tsunami early warning in the Indian Ocean. ADPC has already completed a draft system design document, which will be presented at this meeting.

## Hydrological Component

- ◆ **Improvement of Facilities**
  - **Telemetry System Project since late September 1999.**
  - **To collect activities related to flood monitoring, flood forecasting and warning**
  - **During the year, 109 new telemetric stations were installed.**
  - **On 27 Jan 2006, the project has been carried out 70% of the whole work.**

## Hydrological Component

- ◆ **Flood Forecasting and Warning (basin in operation)**
  - API, and MIKE11 modeling system have been used for flood forecasting and warning systems in the designed three basins namely: Nan, Pasak and Prachin River Basin.
- ◆ **Comprehensive Flood Loss Prevention and Management**

Serous flood events occurred in the several places of the country. Flood forecasting and flood warning were concentrated together with flood risk mapping.

## conclusion

1. **Develop Disaster Management Strategies**
  - a. Mitigation, Preparedness, Response and Recovery
  - b. Roles and Responsibilities for Central Government and Local Government
  - c. Develop IT Strategies and Reference for Best-Practices
2. **Develop Long Term Plan based on Priorities**
  - a. Investment Plan
  - b. IT implementation Plan
  - c. Develop coordination Plan, national and international level
3. **Make Consensus and Cooperate with Relate Agencies**



## Recommendations

- ◆ Unpredictable natural disasters like earthquakes should gain more attention from concerned parties before undesirable phenomena occur, particularly in developing countries like Thailand where losses caused by severe earthquakes have not been experienced before.
- ◆ The lack of knowledge and technology in the field of seismology and earthquake engineering, together with insufficient preparedness for natural disasters of this kind, may lead to massive damage to the area in which they take place.

