



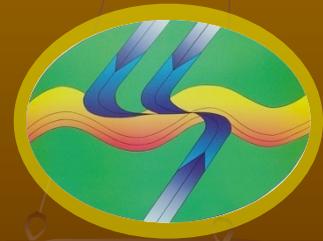
# ADRC

**A**si**a**n **D**isaster **R**eduction **C**enter  
(ADRC)

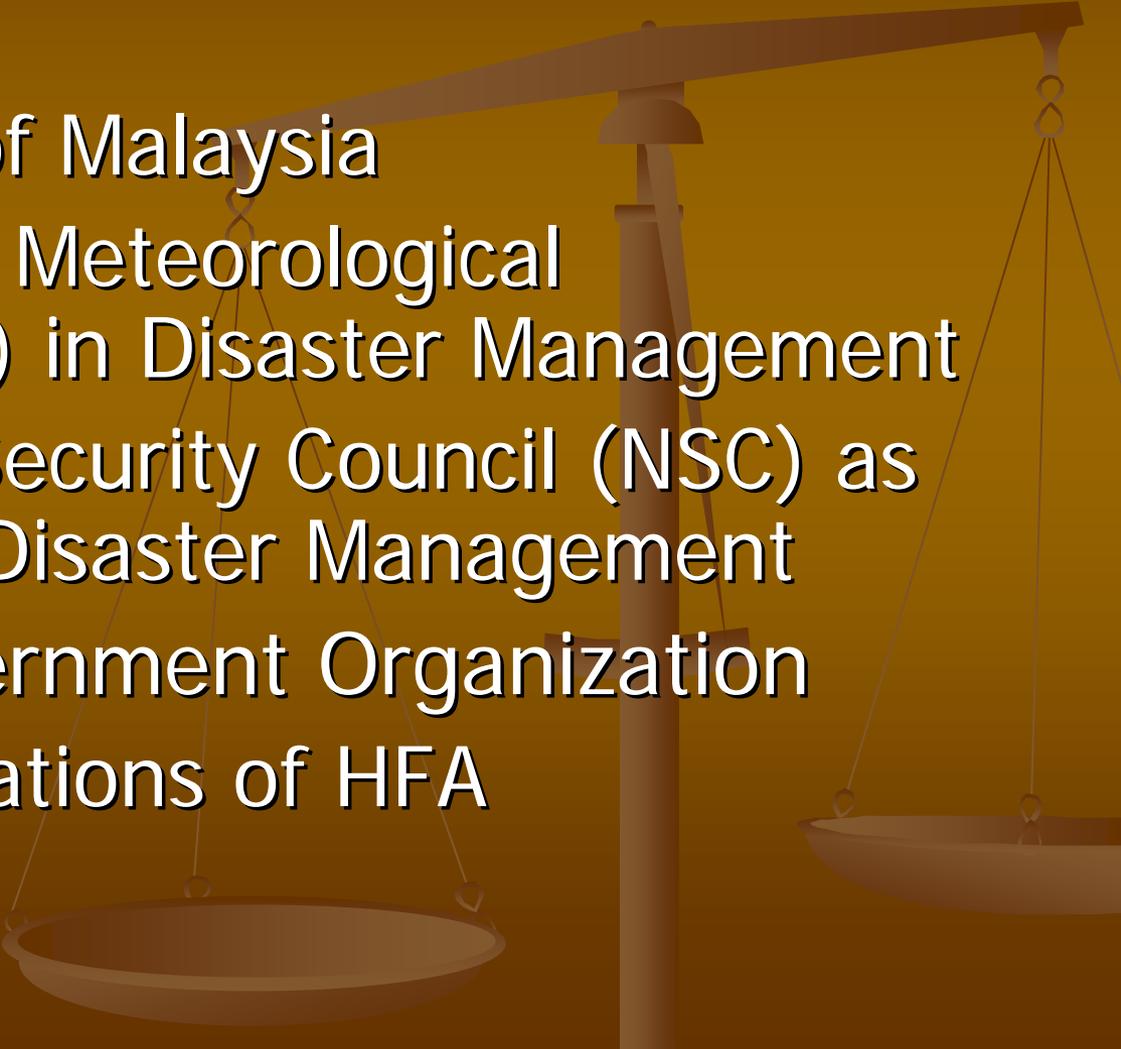
## MALAYSIA COUNTRY REPORT



MUHAMMAD KHALIL BIN AB AZIZ  
MALAYSIAN METEOROLOGICAL DEPARTMENT



# Outline of Presentation

- Introduction
  - Natural Disaster of Malaysia
  - Role of Malaysian Meteorological Department (MMD) in Disaster Management
  - Role of National Security Council (NSC) as leading agency in Disaster Management
  - Role of Non Government Organization
  - Progress and situations of HFA
  - Conclusion
- 

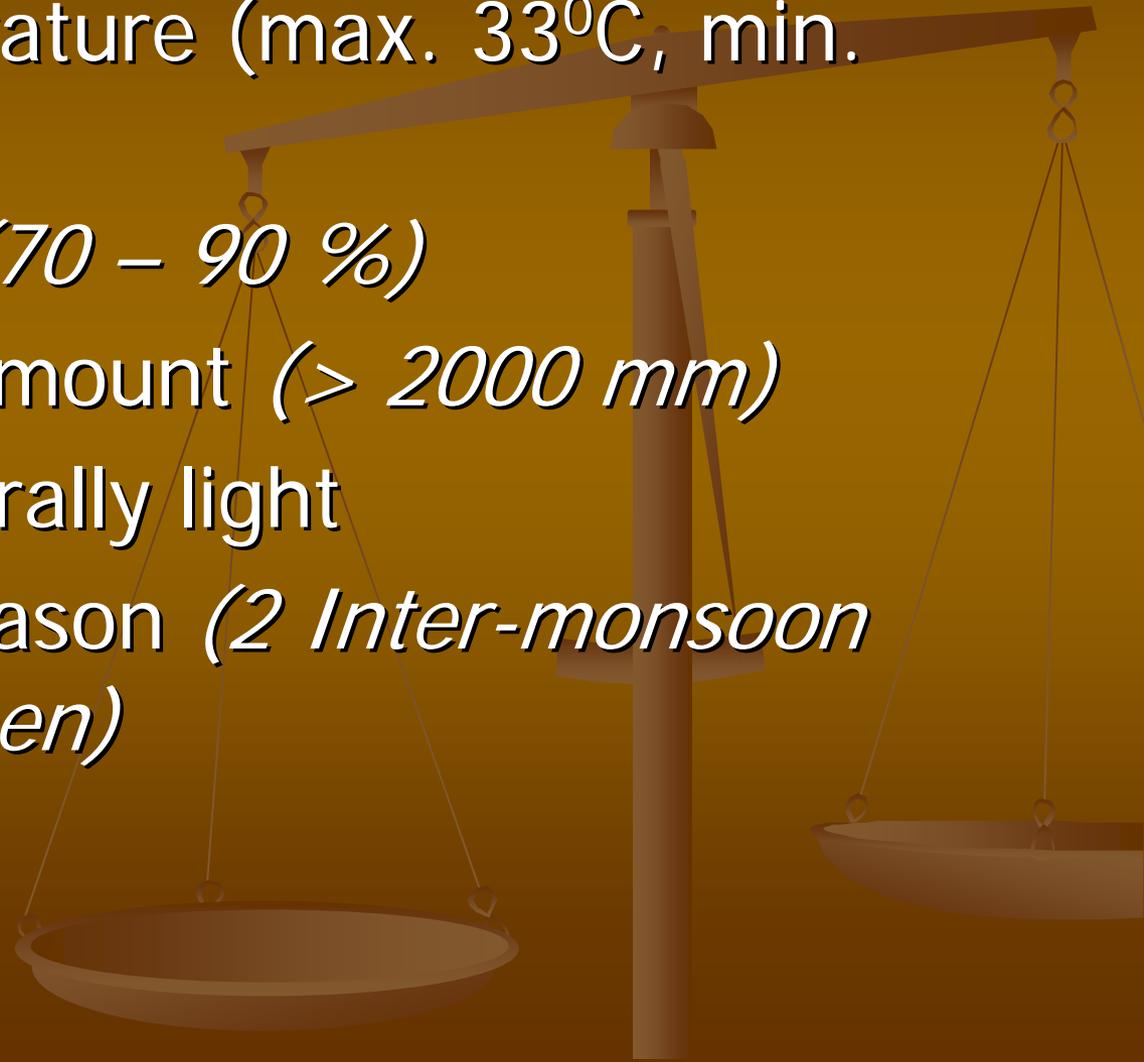
# Introduction to Malaysia



Estimate Population = 27 m  
Land Area = 328,550 sq km  
Malaysia Coast Line = 4,675 km  
State: 13 State + 3 Federal Territories  
District: 114 Districts

# CLIMATE OF MALAYSIA

- Uniform temperature (max. 33°C, min. 23°C)
- High humidity (70 – 90 %)
- Heavy rainfall amount (> 2000 mm)
- Winds are generally light
- 2 monsoon's season (2 *Inter-monsoon period in between*)



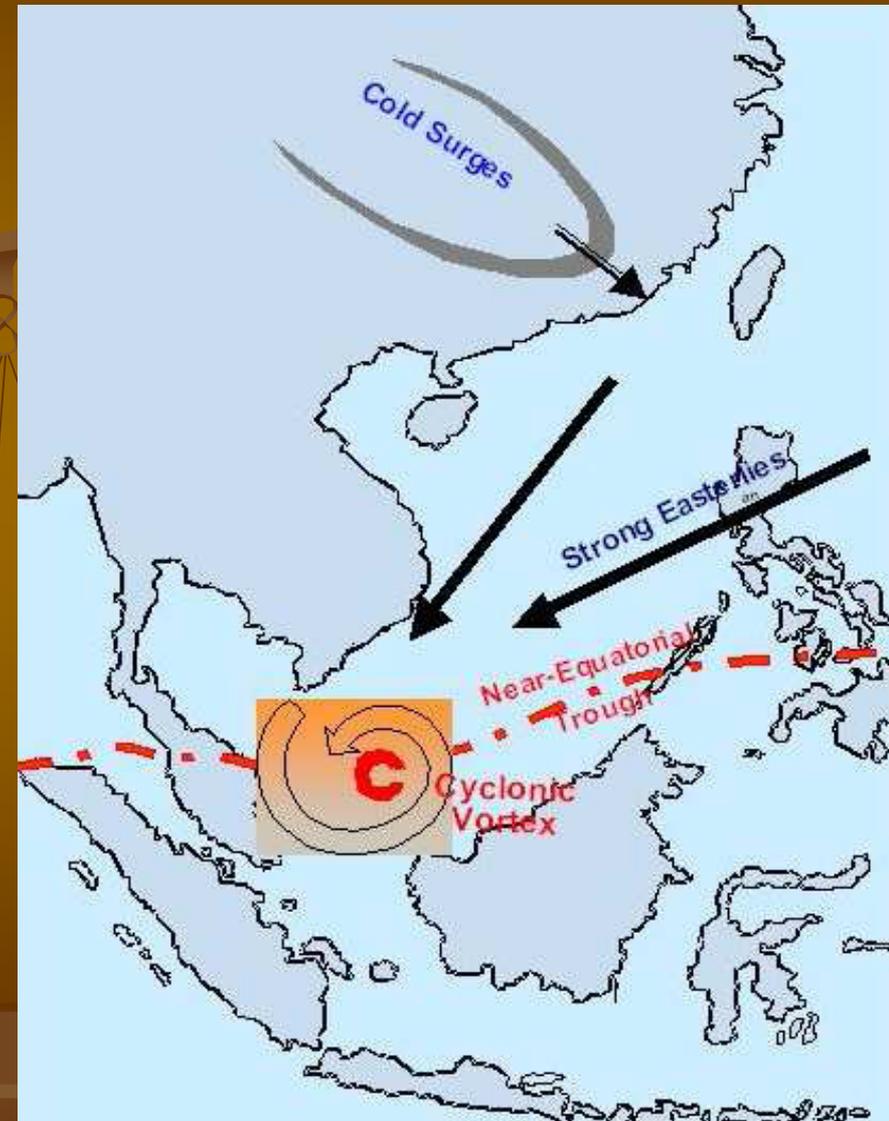
# Monsoon in Malaysia

- i) Northeast Monsoon (*Nov – Mar*)
- ii) Southwest Monsoon (*May – Sept*)
- iii) 2 Inter-Monsoon (*April & Oct*)



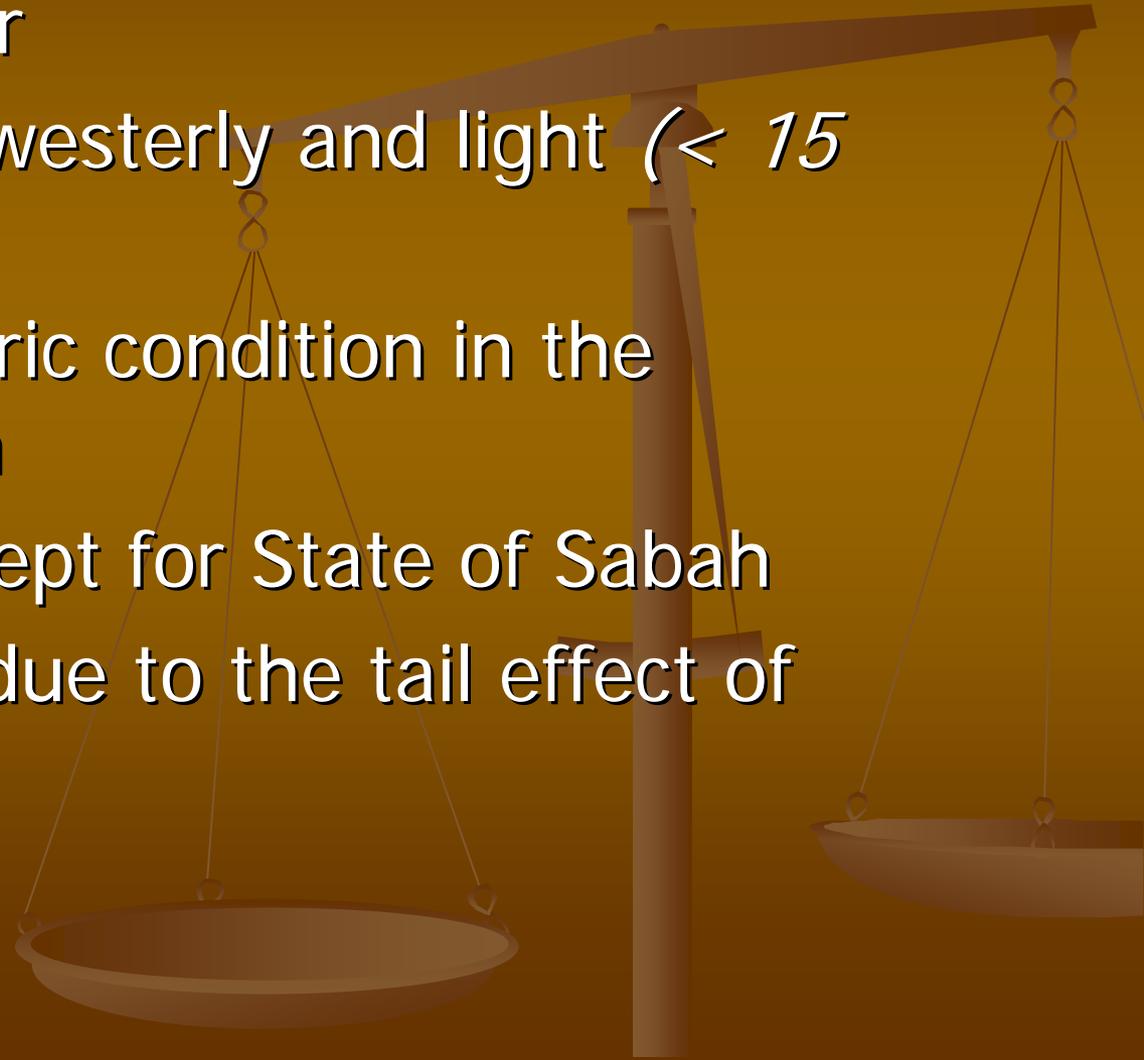
# i) Northeast Monsoon

- November – March
- Steady easterly and northeasterly (*10-20 knots*)
- Cold surges from Siberia (*> 30 knots*)
- Monsoon weather systems which develop in conjunction with cold air outbreaks from Siberia produce rains that last for days and often cause severe floods over east coast peninsula and Sarawak



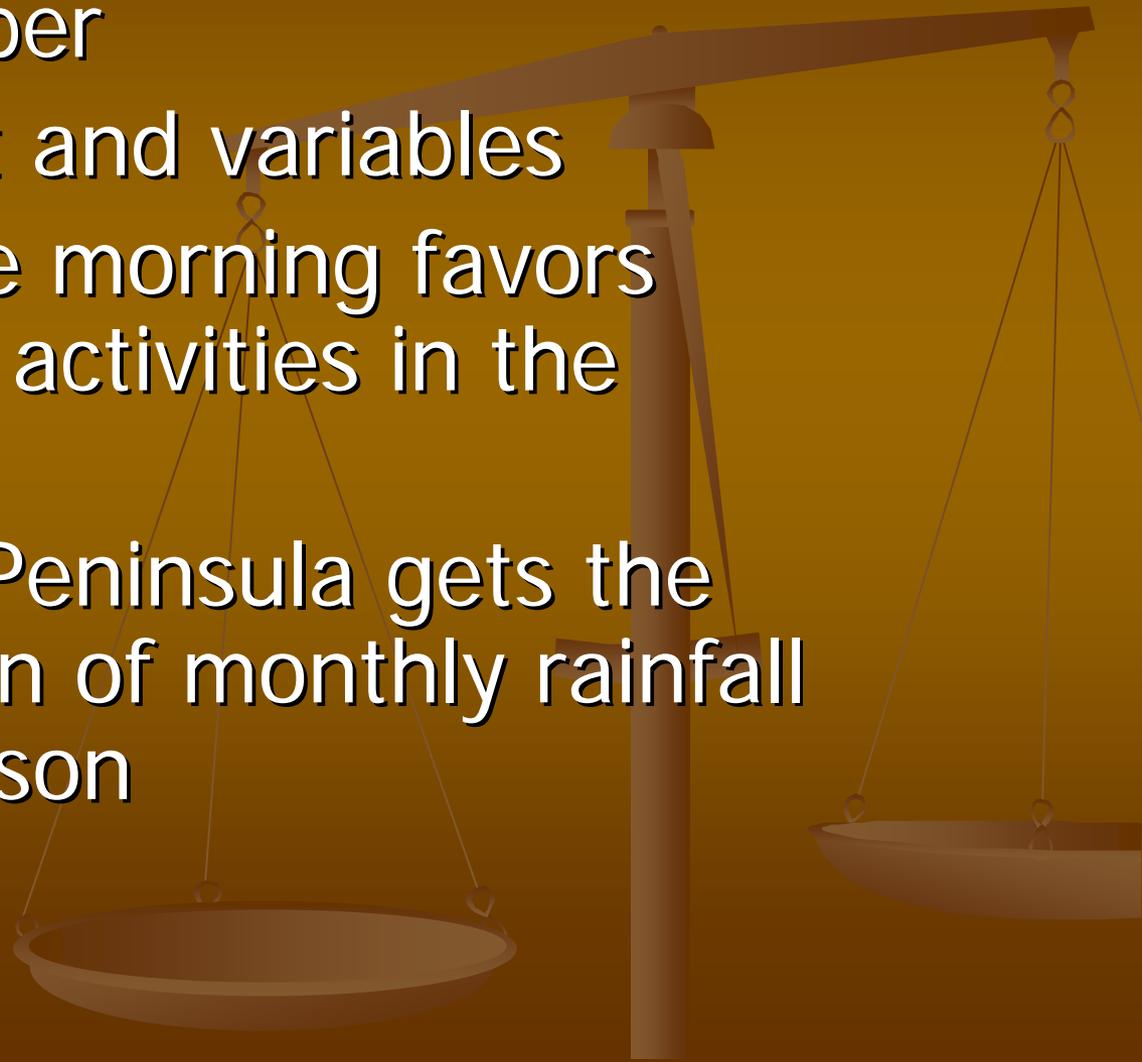
## ii) Southwest Monsoon

- May – September
- Winds are southwesterly and light ( $< 15$  knots)
- Stable atmospheric condition in the Equatorial region
- Drier season except for State of Sabah
- Sabah is wetter due to the tail effect of typhoons



### iii) Inter – Monsoon

- April and October
- Winds are light and variables
- Clear sky in the morning favors thunderstorms activities in the afternoon
- West coast of Peninsula gets the maximum mean of monthly rainfall during this season

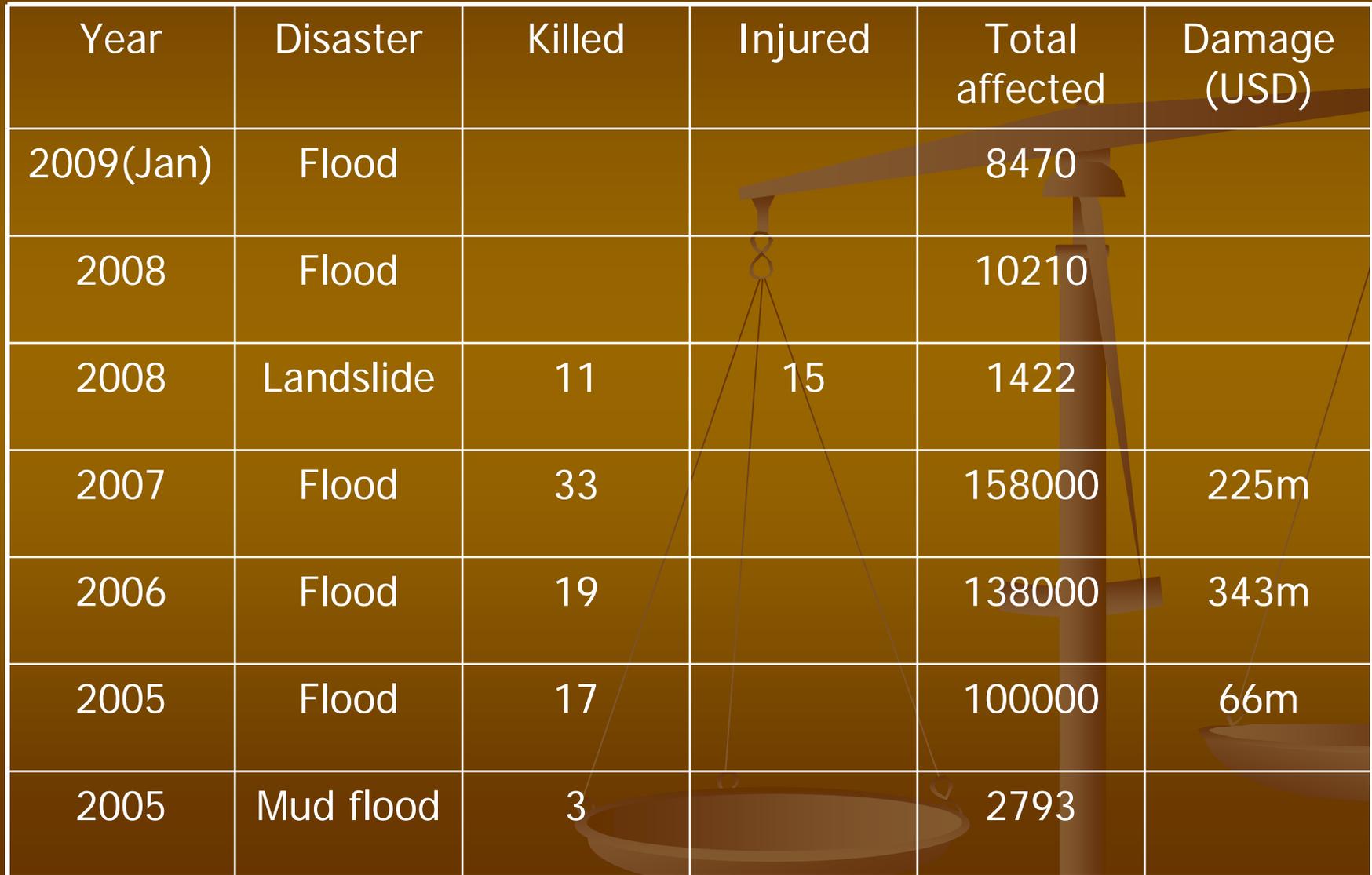


# Natural Disaster in Malaysia

- Wind Storms e.g. Typhoons, Tropical Storms, Thunderstorms, Squall lines
- Heavy Rain, Floods & Landslides
- Tsunamis
- Droughts
- Forest/Grassland Fires, Haze(local & trans boundary)

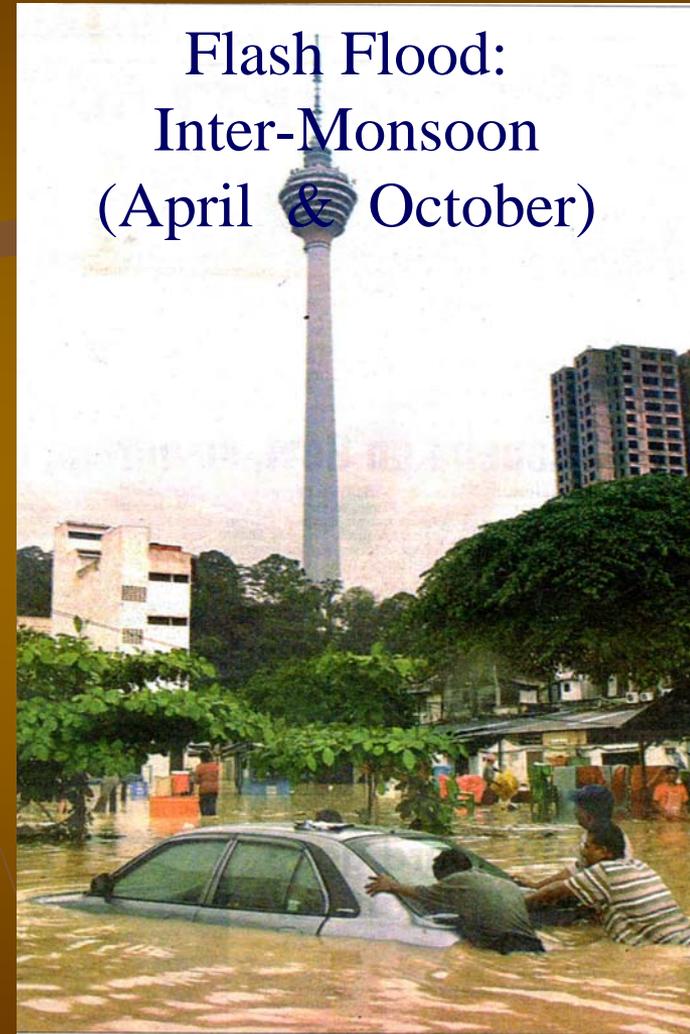
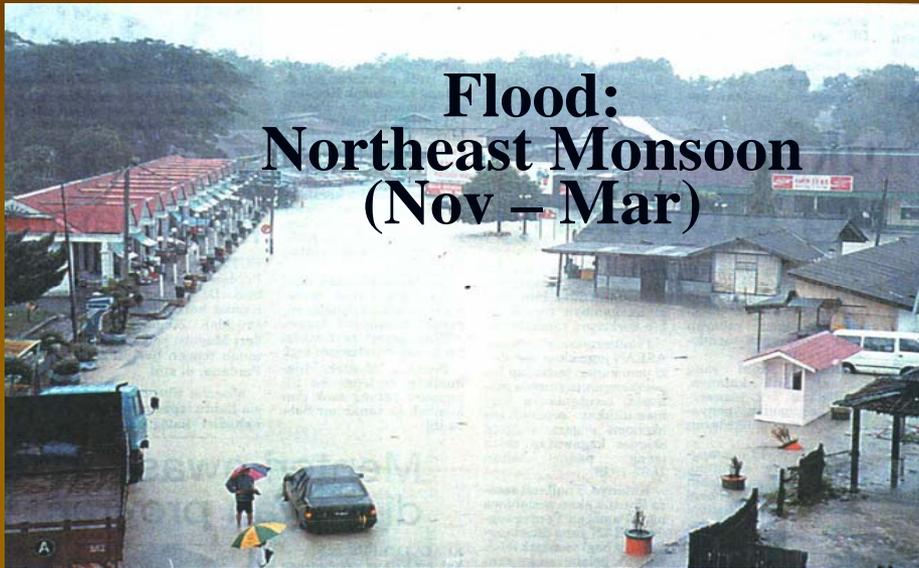


# Recent major disasters for past few years



Year	Disaster	Killed	Injured	Total affected	Damage (USD)
2009(Jan)	Flood			8470	
2008	Flood			10210	
2008	Landslide	11	15	1422	
2007	Flood	33		158000	225m
2006	Flood	19		138000	343m
2005	Flood	17		100000	66m
2005	Mud flood	3		2793	

# Severe Weather & Seasons



**Haze:  
Southwest Monsoon  
(Jun – Sep)**



# NE Monsoon Flood in Kelantan, Malaysia (Dec 2004)



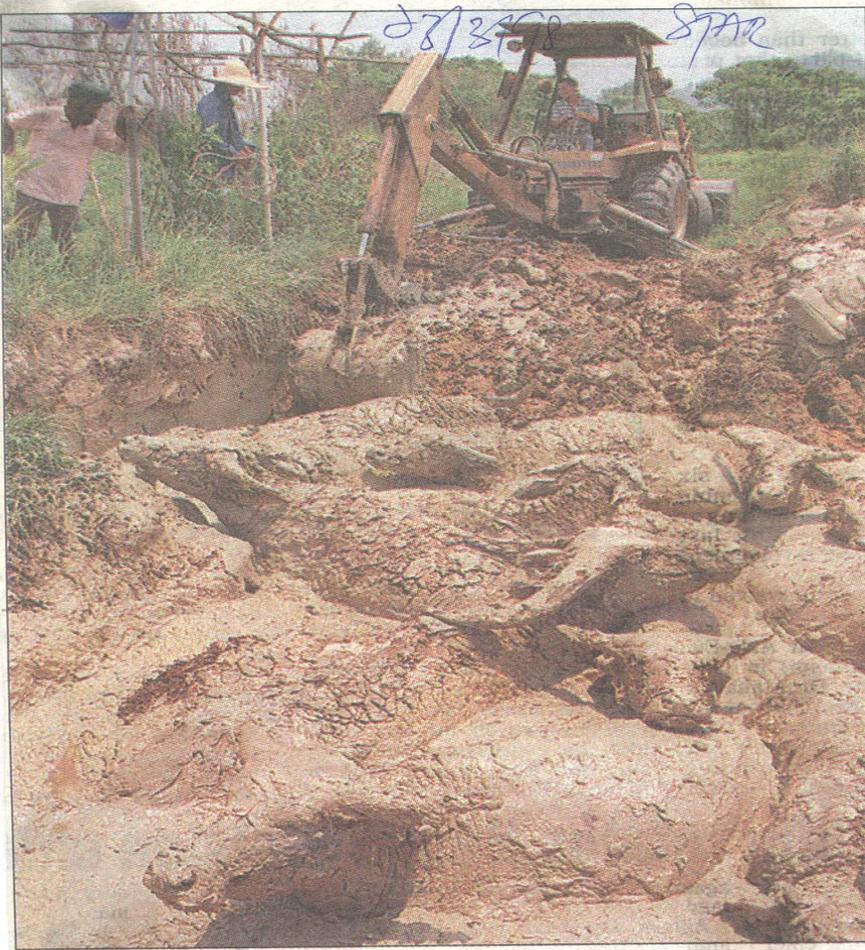
# Flash Flood and Landslides due to Severe Thunderstorms/Heavy Rain



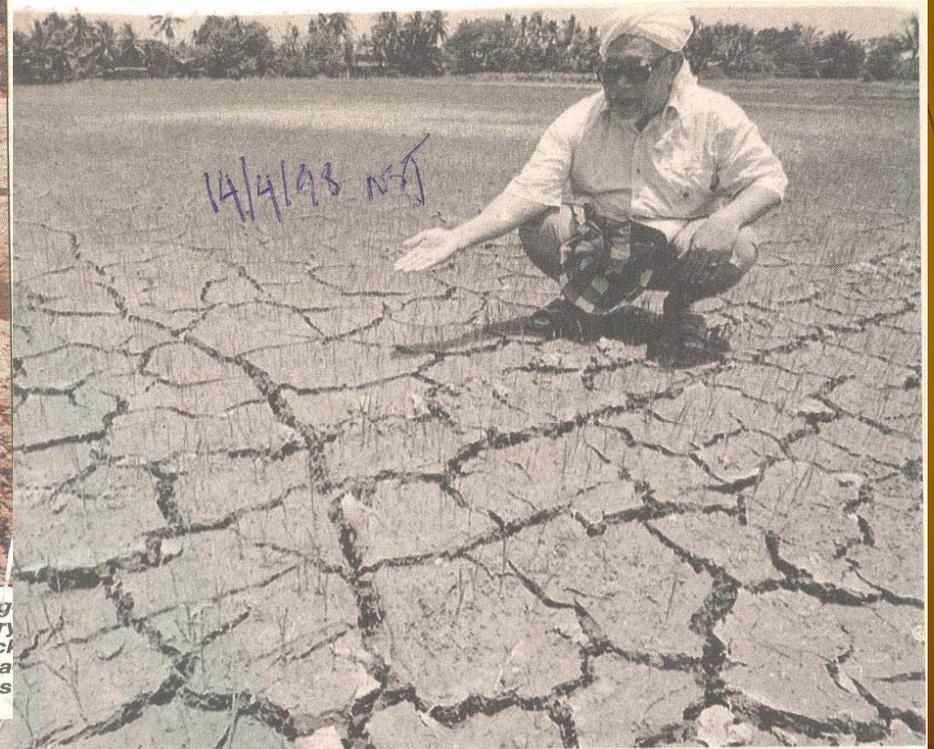
# Forest Fire & Haze



# Impacts of 1997/1998 El Nino



**STUCK** Nineteen buffaloes were drawn to this pond near a vegetable farm in Bercham, Perak to cool off during the dry spell. But they stayed too long and the water dried up. Farmer Lim Yee Hock had to bring in an excavator to rescue his buffaloes from their sticky predicament on Saturday. Three of them died during the rescue operation which lasted more than 30 hours. Lim estimates his losses at RM2,000. mada



**THREATENING SITUATION ...** Farmer Mohd Akhir Idris wonders whether his crops can survive under such harsh weather conditions. His padi fields, located along Jalan Langgar near Alor Star, have dried up despite regular water supply from Mada. — NST picture by Jamah Nasri

# Tsunami - 26 December 2004



# Damages caused by storm Vamei



STAR  
29-12-2001

**TOUGH TASK ...** search and rescue team members going through logs and other debris washed down by a mudslide that occurred at the foot of Gunung Pulai near Pekan Nanas late on Thursday. — IBRAHIM MOHTAR



## Five swept away by mudslide

By ZUHRIN AZAM AHMAD and LAM LI

PEKAN NANAS: Five people, including a mother and her three children, were swept away into a river during a mudslide at the foot of Gunung Pulai, late Thursday night.

Rescuers have so far recovered only one victim, Salina Abas, 34, some 500m away from her demolished house.

Johor Deputy CPO Senior Asst Comm I Abu Bakar Said said the woman's body was found at about 7.30am yesterday among piles of tree trunks and debris carried by the mudslide.

The search and rescue operation for the remaining missing victims continued up to late yesterday.

The missing are three of Salina's

● TURN TO PAGE FOUR

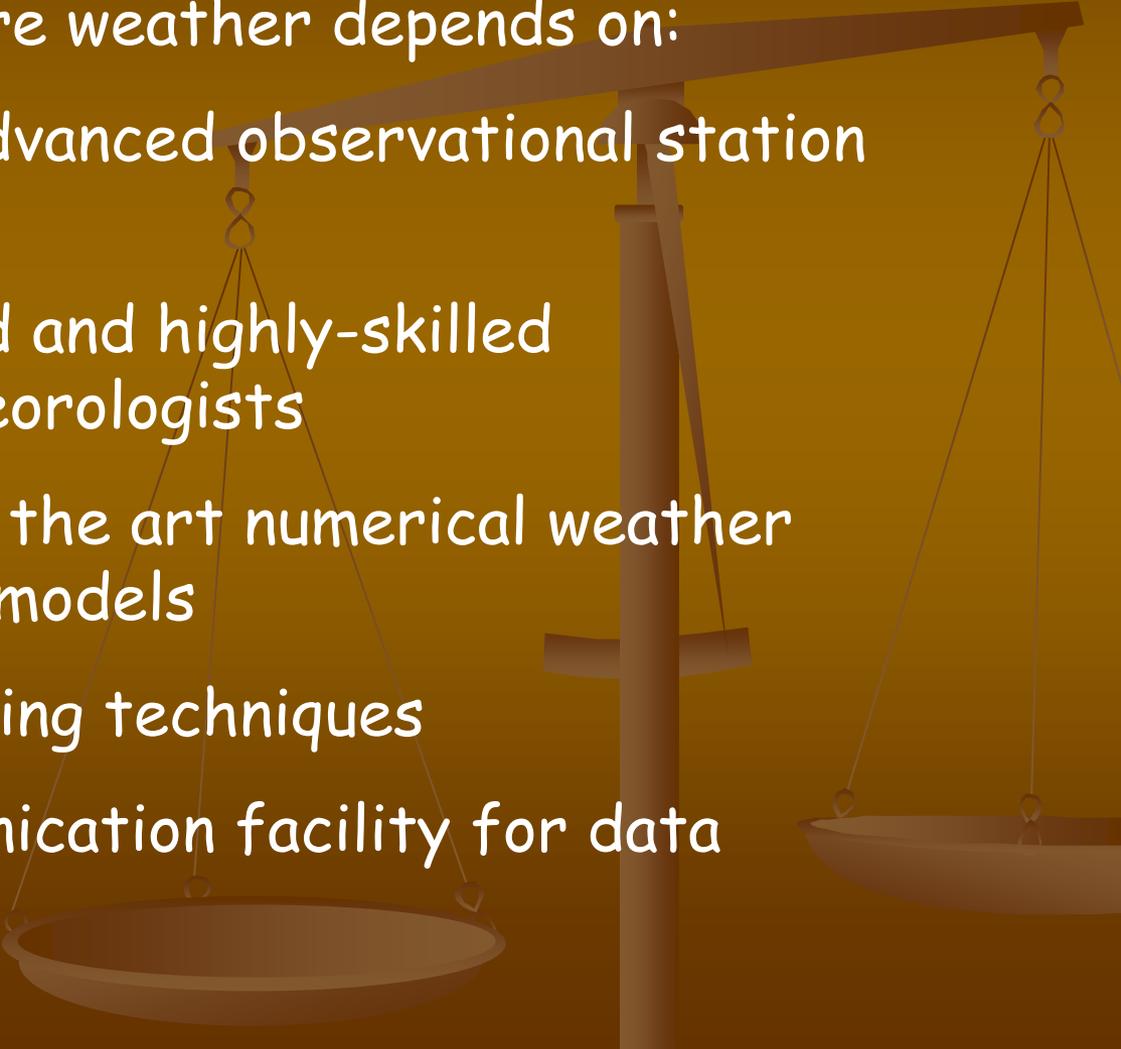
# Role of MMD

- Monitoring and Forecasting
- Warning Systems
- Criteria of Warning
- Warning Dissemination

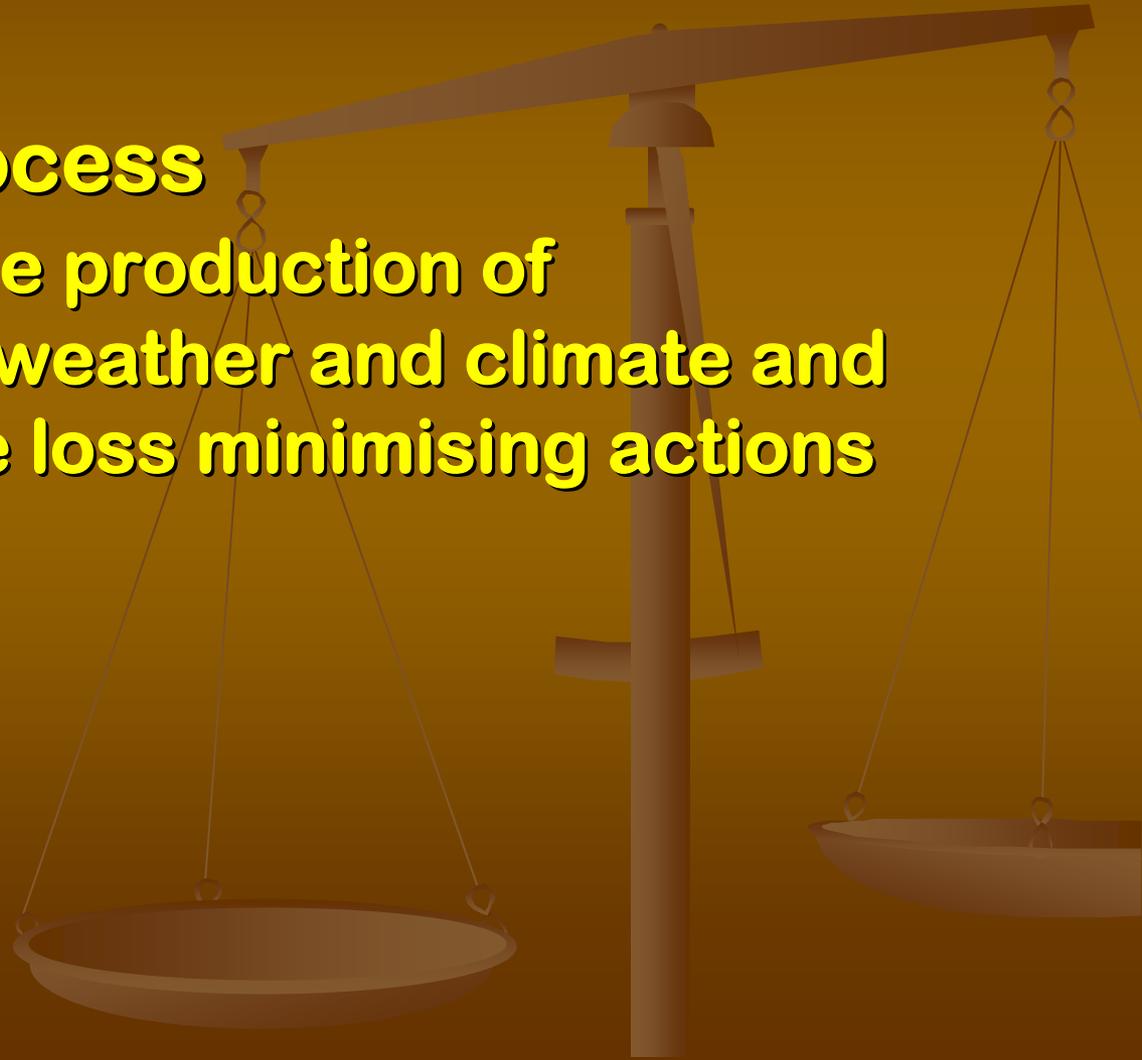


# Monitoring and Forecasting Severe Weather

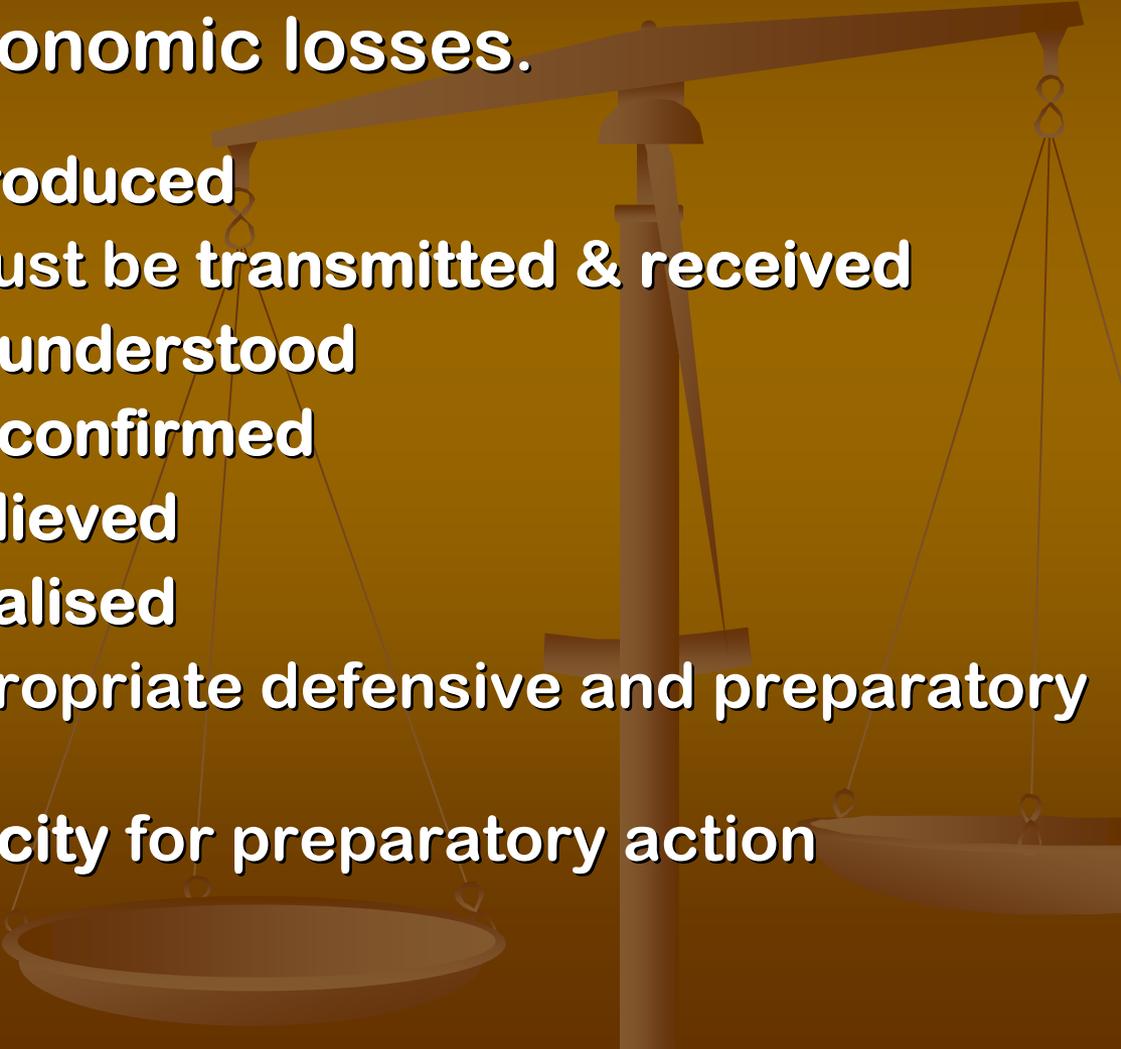
The effective monitoring and prediction of the occurrences of severe weather depends on:

- ✓ An efficient and advanced observational station network
  - ✓ Adequately-trained and highly-skilled technicians and meteorologists
  - ✓ Access to state of the art numerical weather and wave prediction models
  - ✓ Improved forecasting techniques
  - ✓ High speed communication facility for data transfer
- 

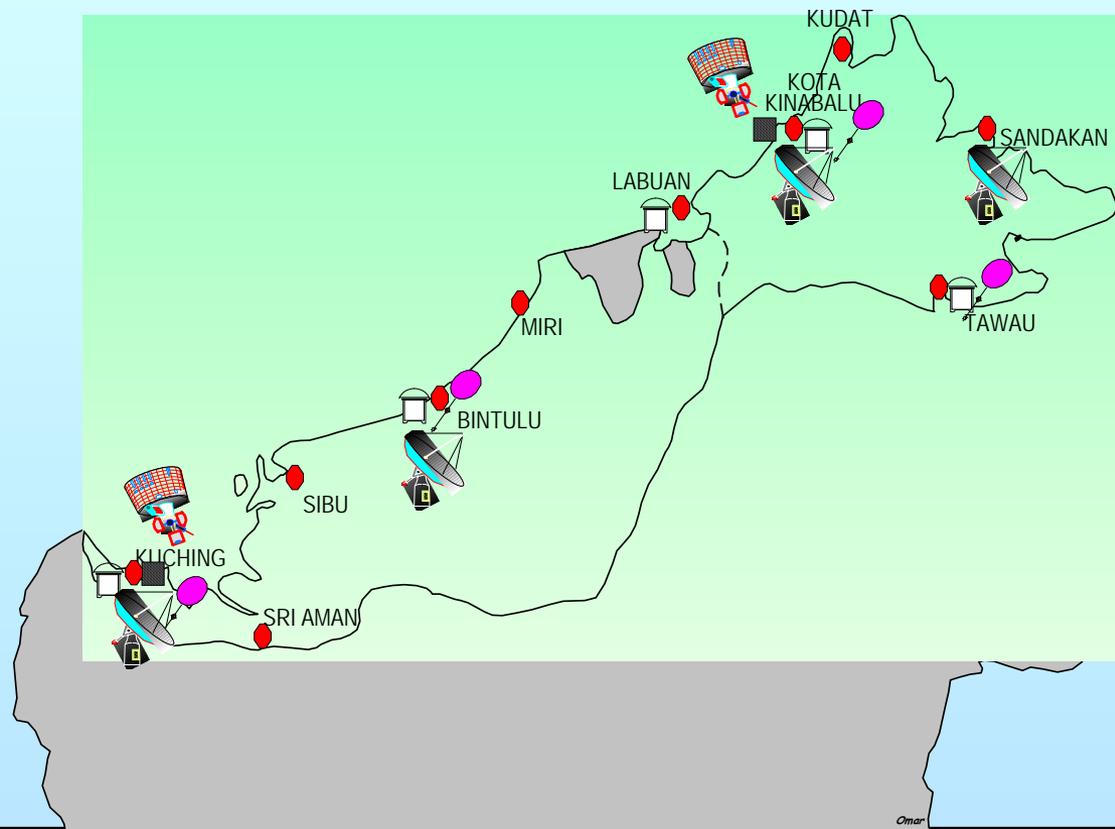
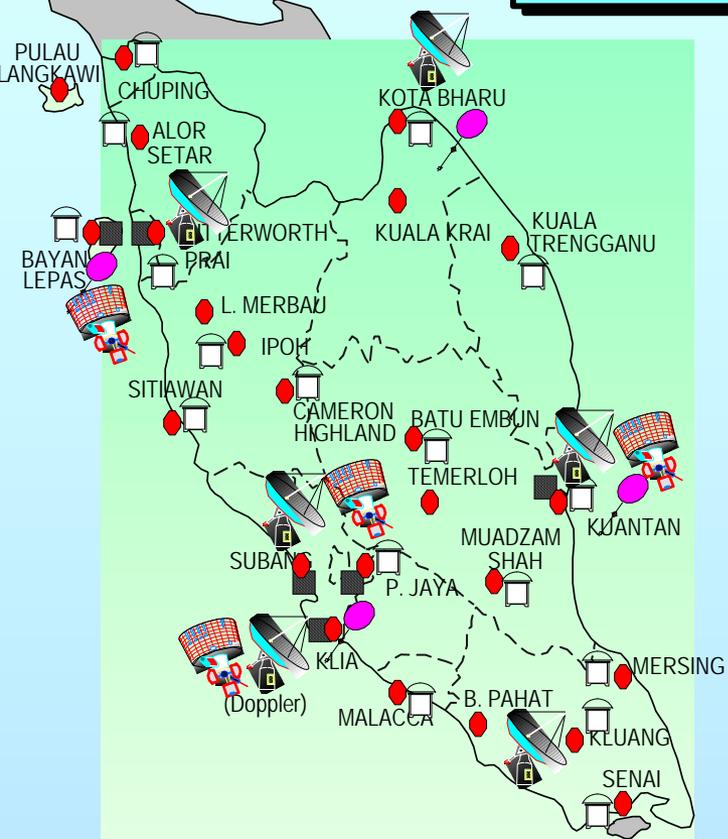
**Warnings - a process  
that begins with the production of  
information about weather and climate and  
ends with effective loss minimising actions**



**Early warning systems provide communities with the information needed to activate disaster plans in time to protect life and minimize economic losses.**

- **Warnings must be produced**
  - **Warning message must be transmitted & received**
  - **Information must be understood**
  - **Information must be confirmed**
  - **Message must be believed**
  - **Risk must be personalised**
  - **Decision to take appropriate defensive and preparatory actions**
  - **Resources and capacity for preparatory action**
- 

# OBSERVATIONAL STATION NETWORK



## LEGEND

 **PRINCIPAL METEOROLOGICAL STATION (38)**

 **AIR POLLUTION STATION (22)**

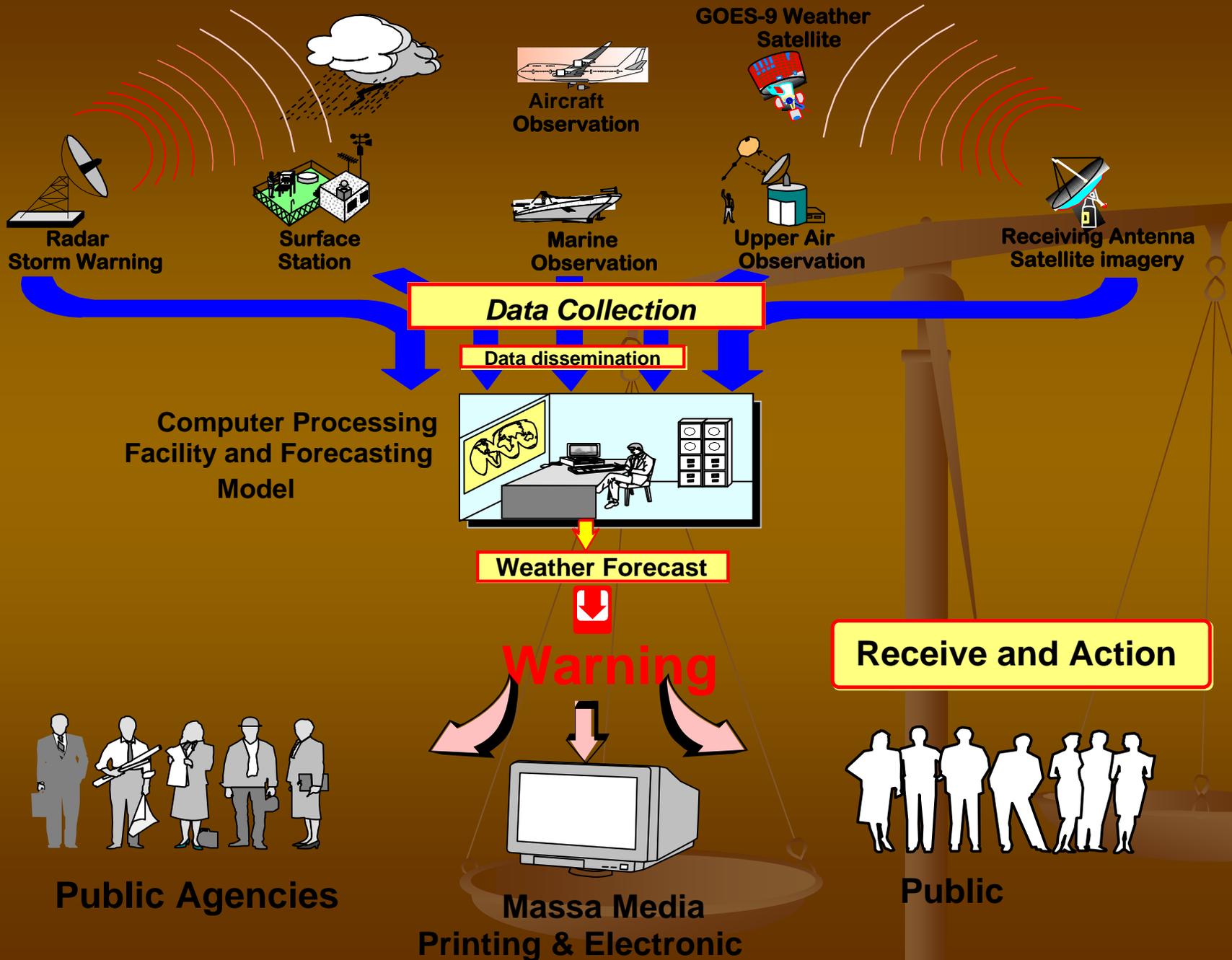
 **UPPER AIR STATION (8)**

 **RADAR STATION (10)**

 **SATELLITE STATION (6)**

 **FORECAST OFFICE (8)**

# WEATHER MONITORING, FORECASTING AND WARNING SYSTEM



# COMPUTERISED TELECOMMUNICATION NETWORK

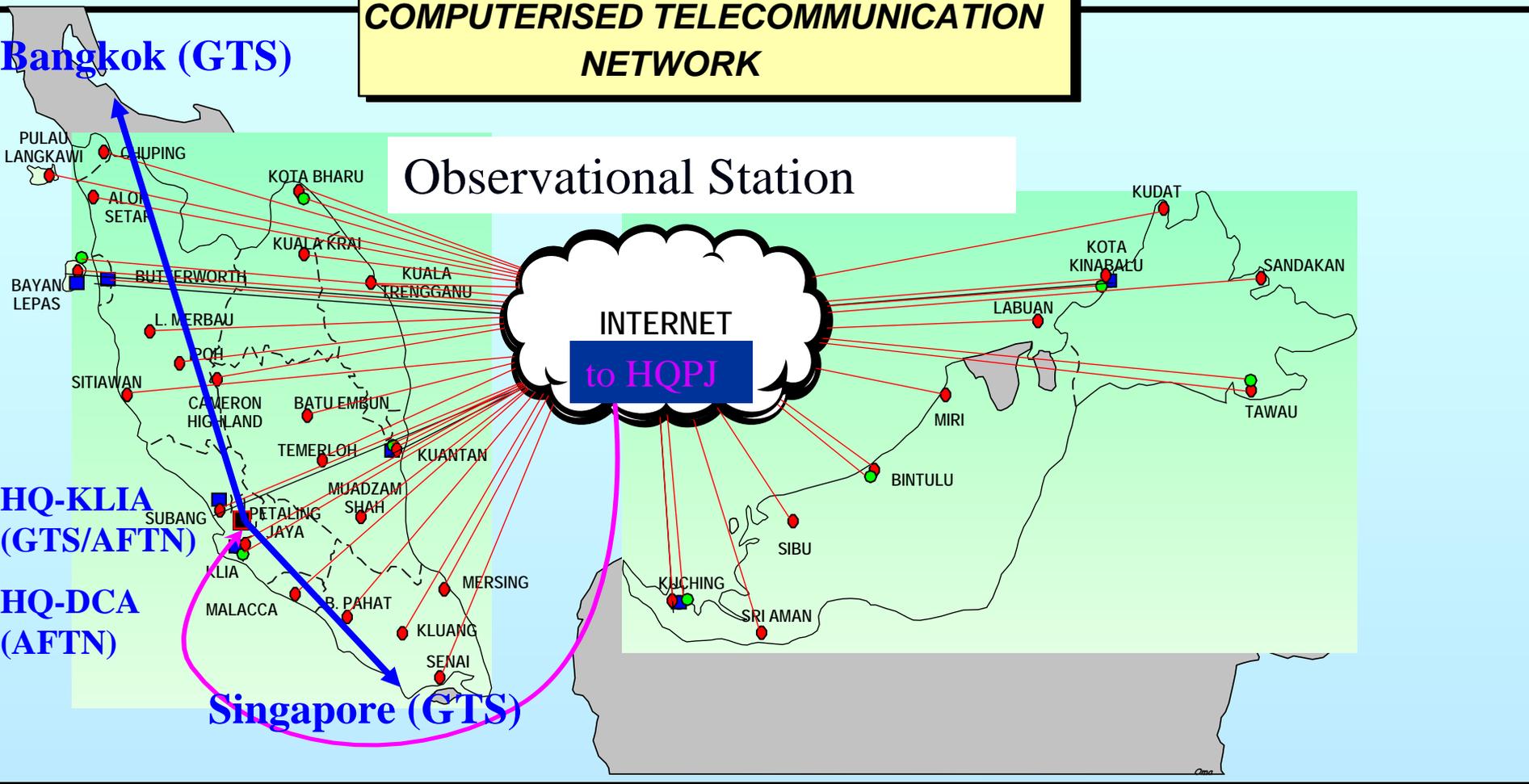
## Observational Station

**Bangkok (GTS)**

**HQ-KLIA (GTS/AFTN)**

**HQ-DCA (AFTN)**

**Singapore (GTS)**



### LEGEND

- TELECOMMUNICATION CENTRE
- FORECAST OFFICE

- ◆ PRINCIPAL METEOROLOGICAL STATION
- UPPER AIR STATION

# Dissemination of Severe Weather and Rough Seas Warning to the relevant agencies, mass media and the public

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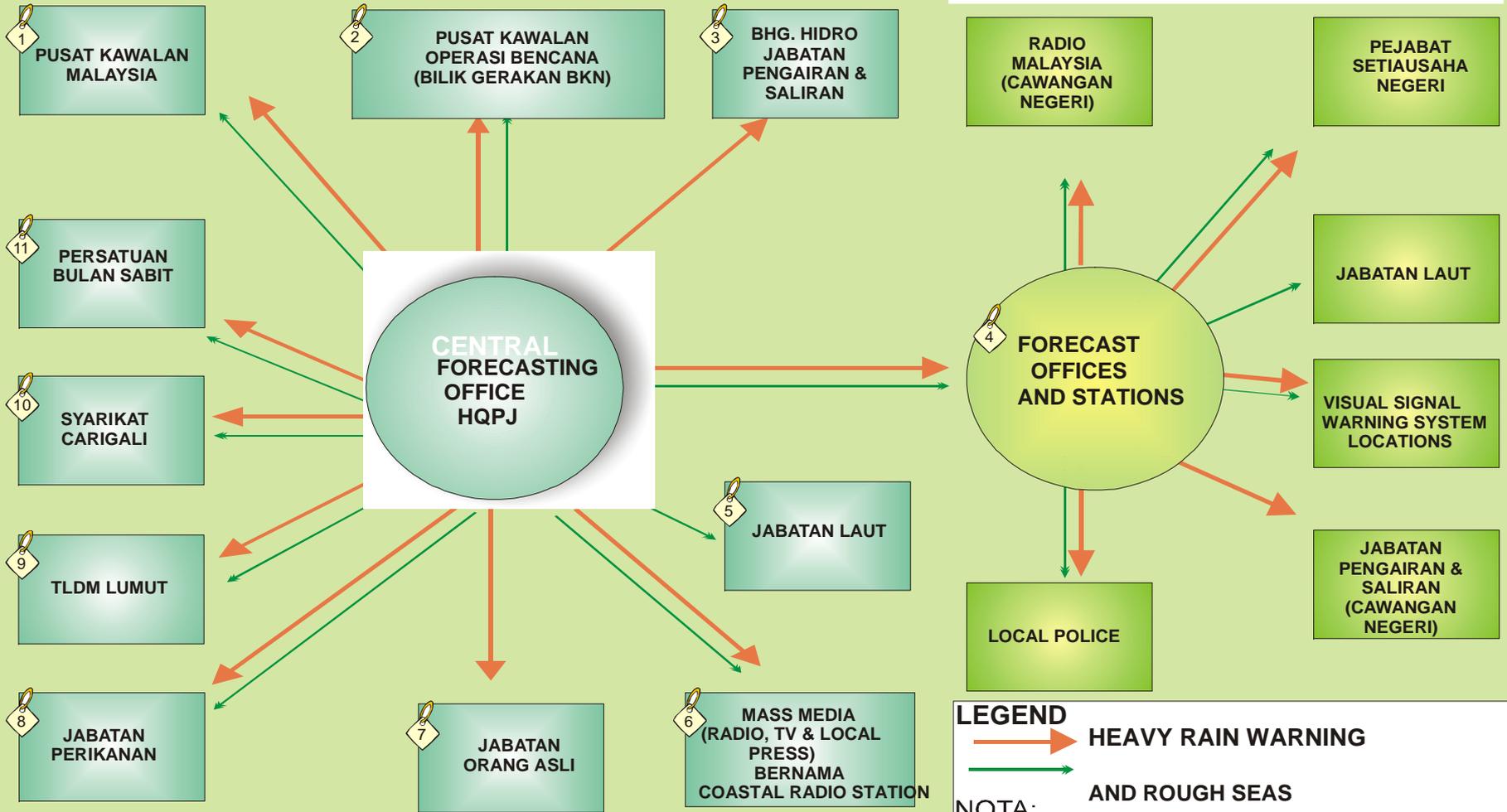
- Facsimile
- Telephone
- Web page (<http://www.met.gov.my>)
- Mass Media
- SMS(BKN, MMD, JPS, Polis, MOSTI & SUK)



# DISSEMINATION OF SEVERE WEATHER AND ROUGH SEAS WARNING IN PENINSULAR MALAYSIA

## NATIONAL LEVEL

## STATE LEVEL



### LEGEND

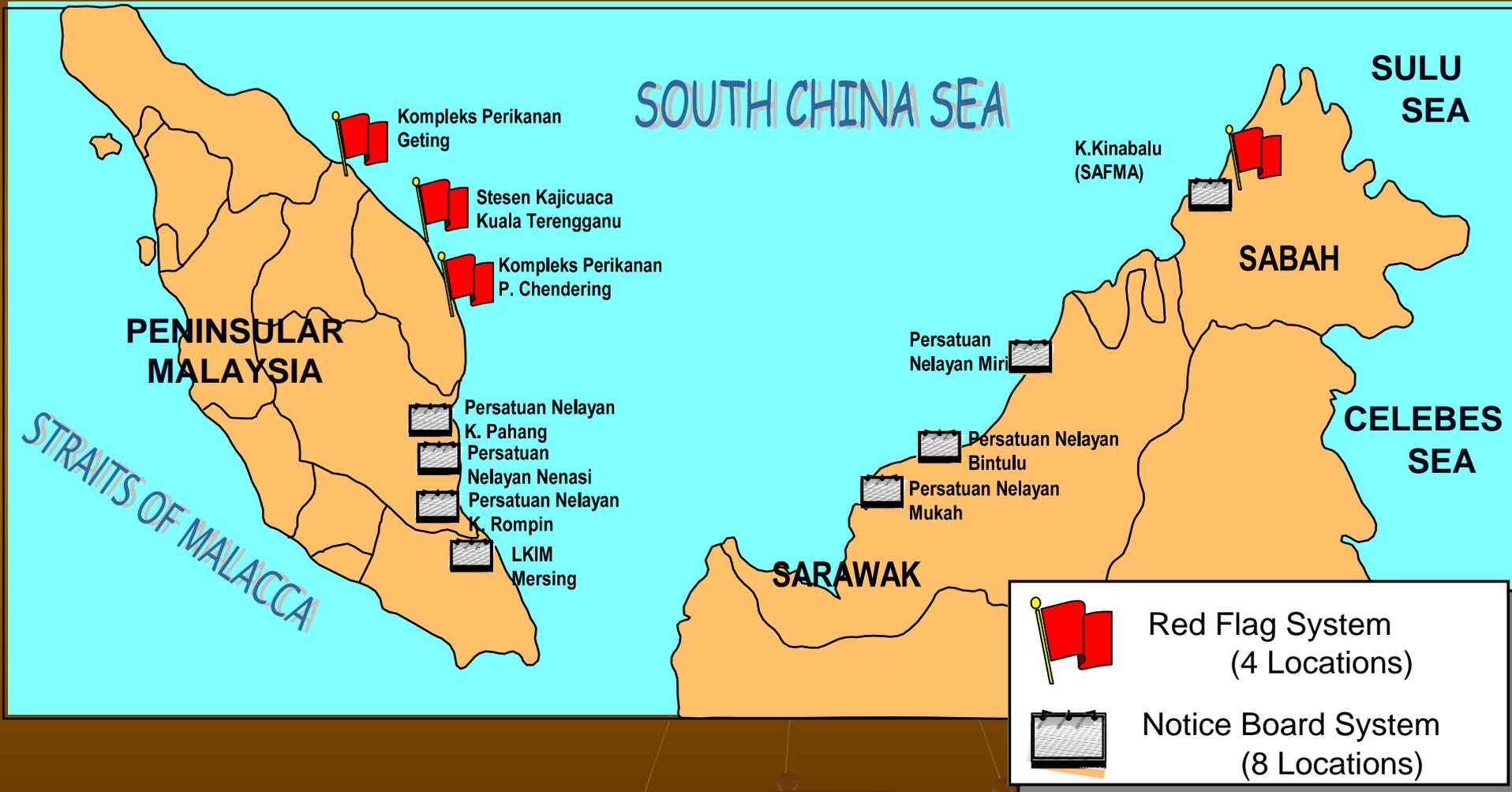
➔ HEAVY RAIN WARNING

➔ AND ROUGH SEAS

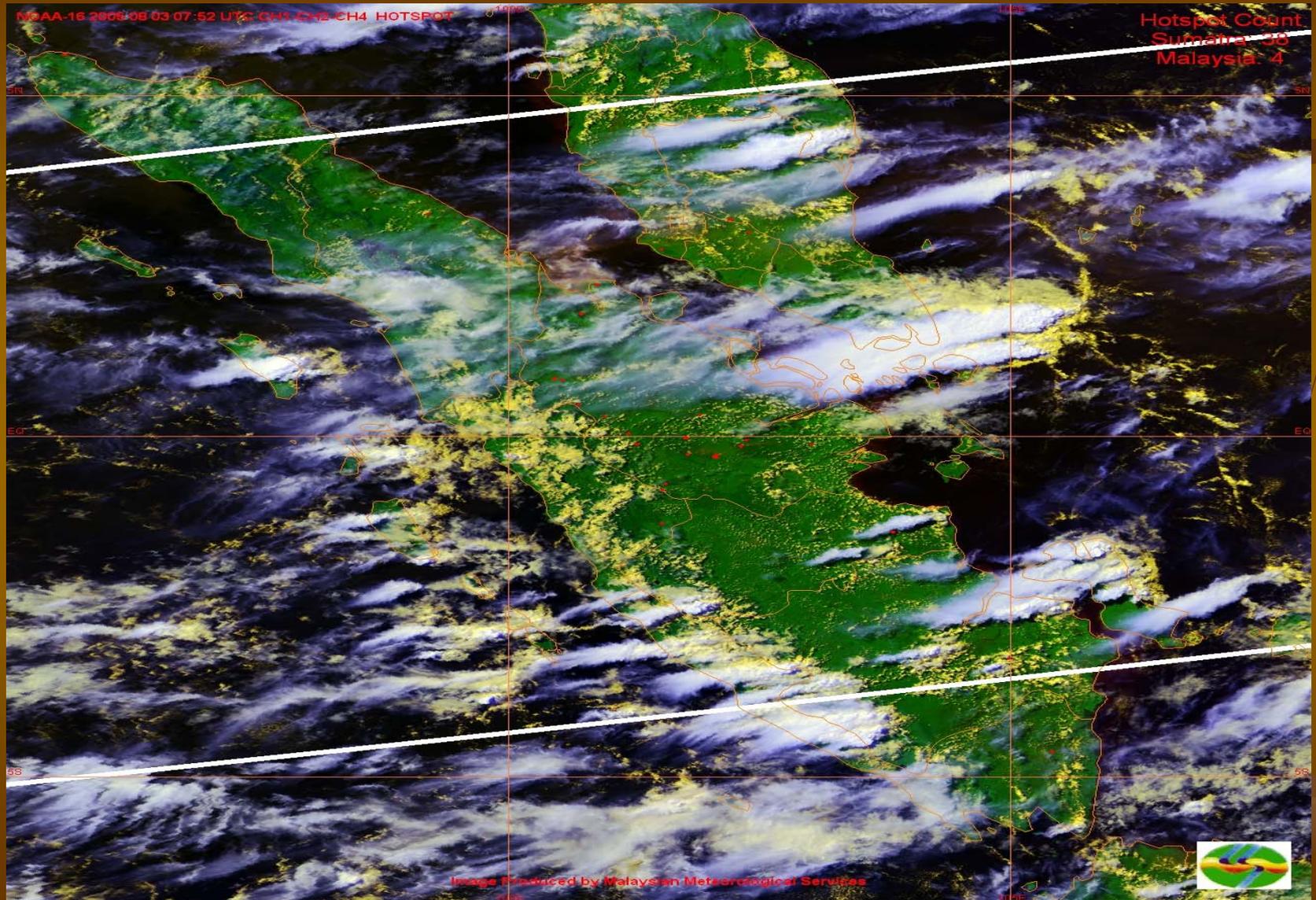
### NOTA:

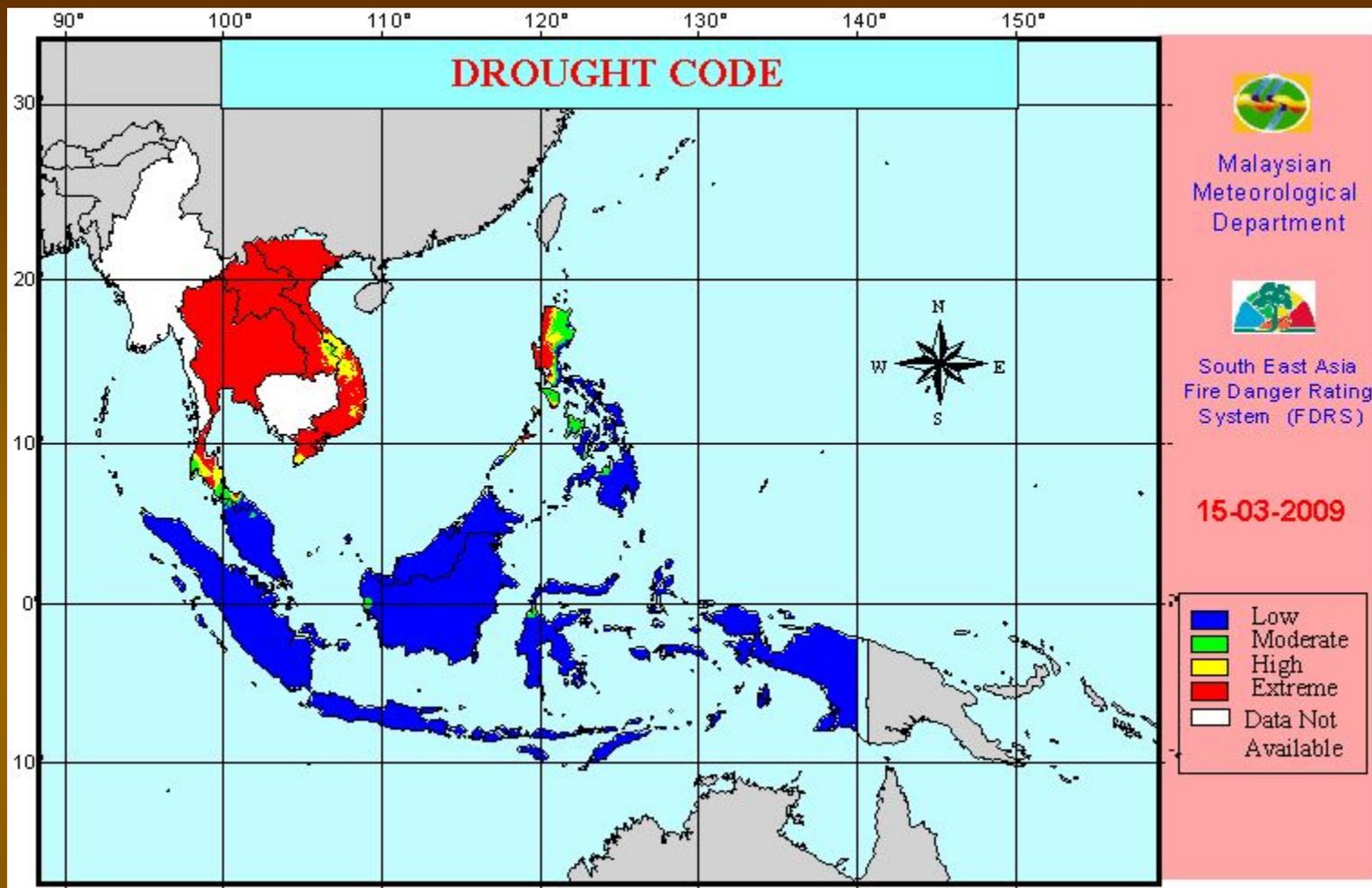
Heavy rain and strong winds advisory  
Sent to 1, 2, 3 and 4 only.

# Strong Winds and Rough Seas Visual Signal System



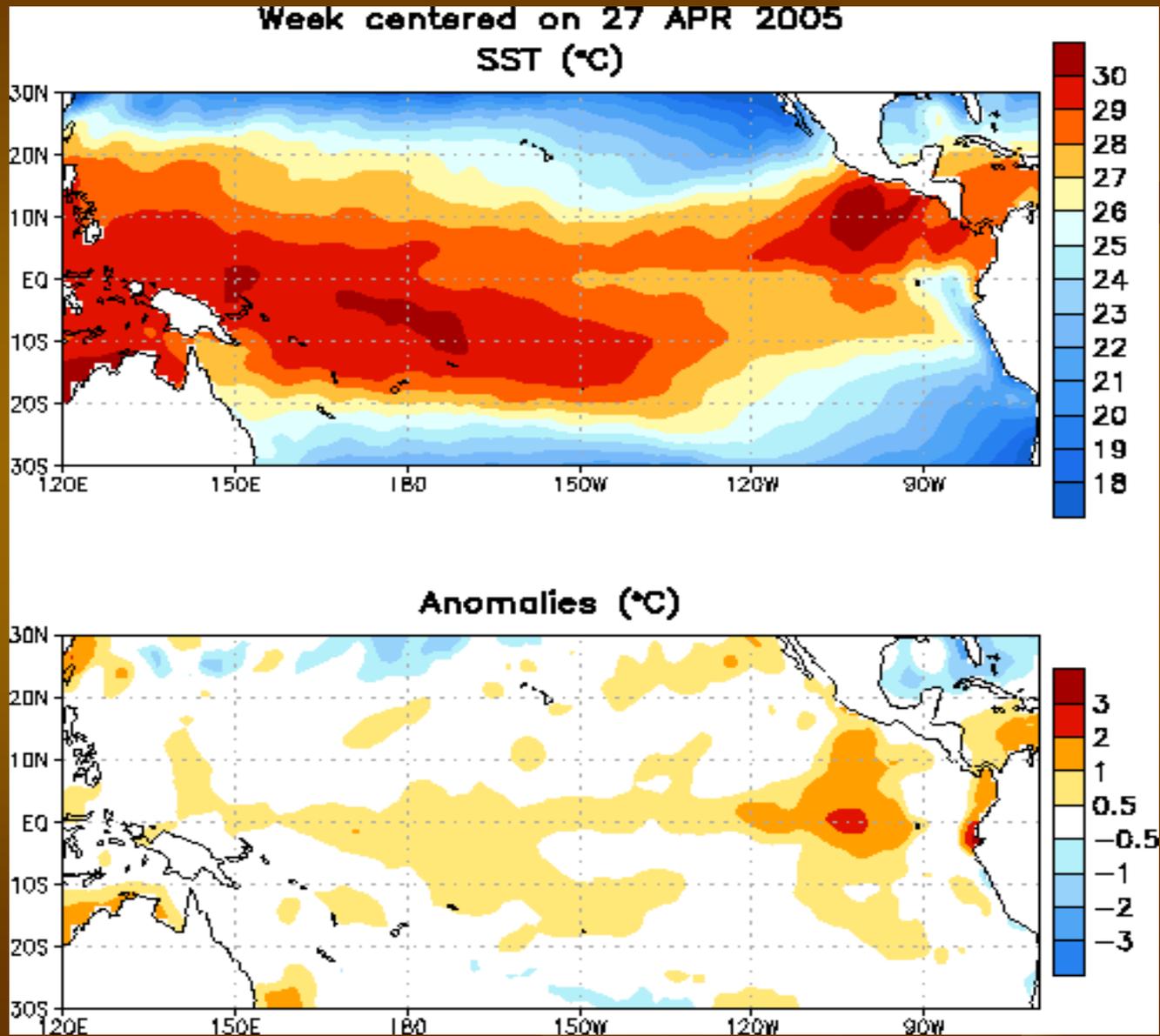
# Hotspots





The DC - indicative values of the moisture content of a deep layer of compact organic matter, such as peat soil, to indicate the potential for fire to smoulder and cause smoke and haze. It can also be used as an indicator of difficulty in extinguishing deep burning peat fires as well as an early warning indicator of serious haze events.

# ENSO Monitoring





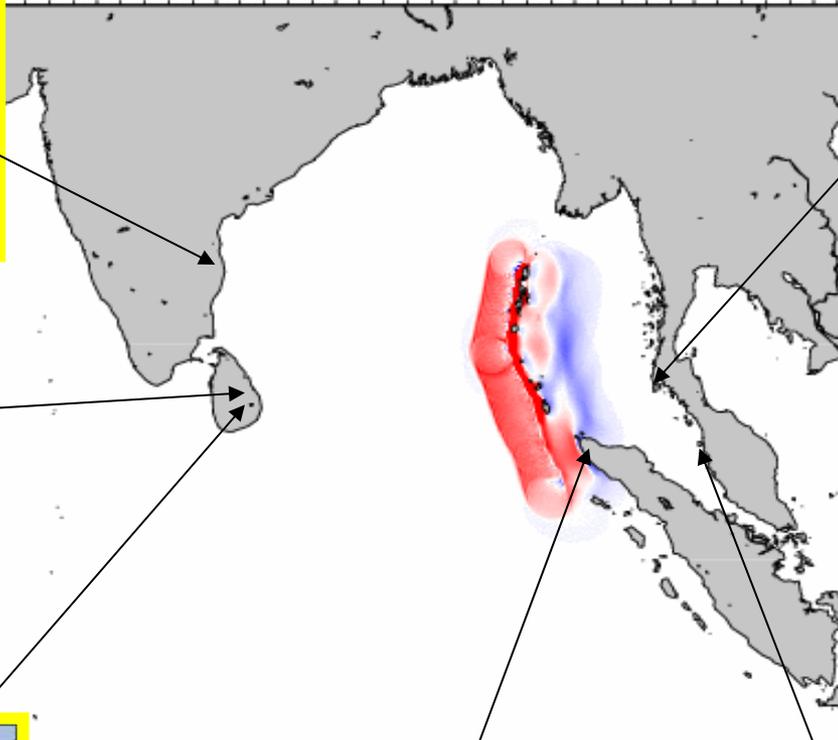
**MALAYSIAN NATIONAL  
TSUNAMI EARLY  
WARNING SYSTEM**

# Geophysics and Tsunami division



2004 Sumatra Earthquake 010 min

ANIMATION OF THE TSUNAMI EVENT IN  
S.E. ASIA ON 26<sup>TH</sup> DEC 2004

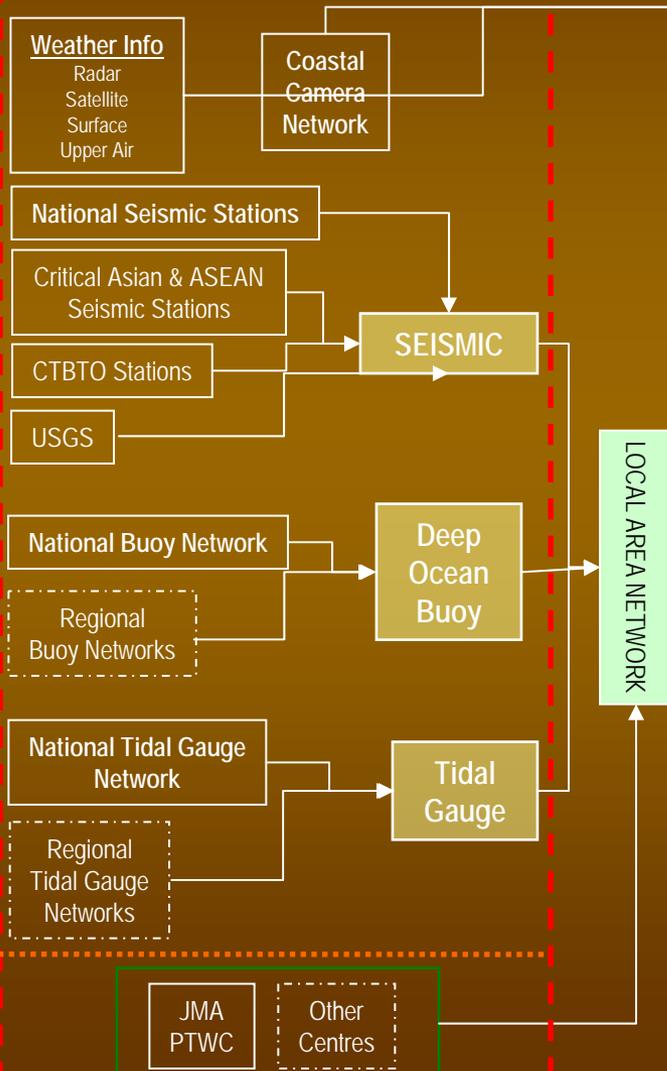


-5°

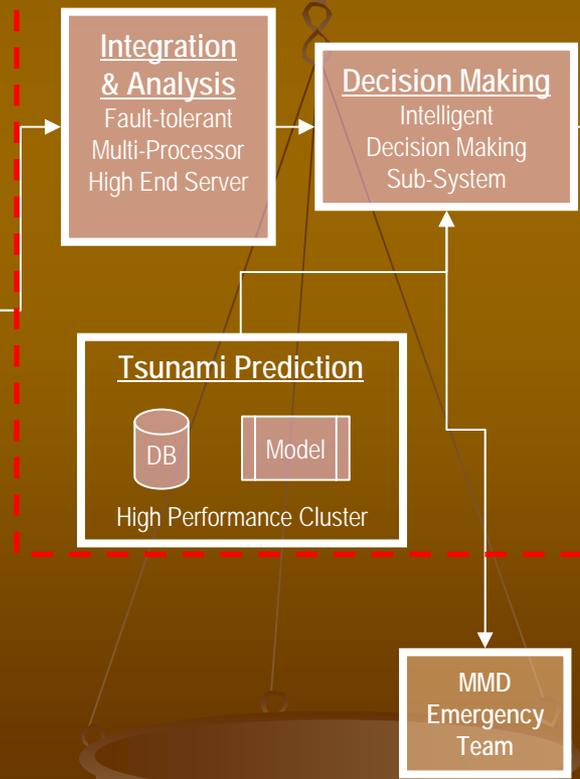


# System Overview

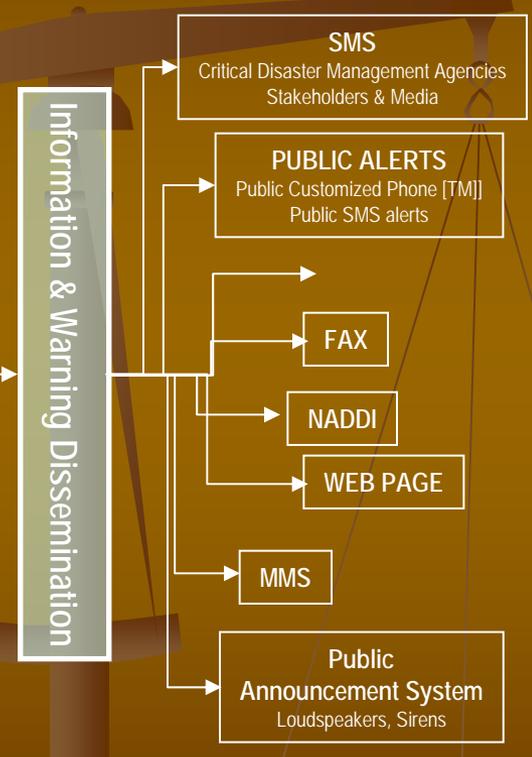
## Data & Information Collection Component



## Processing Component



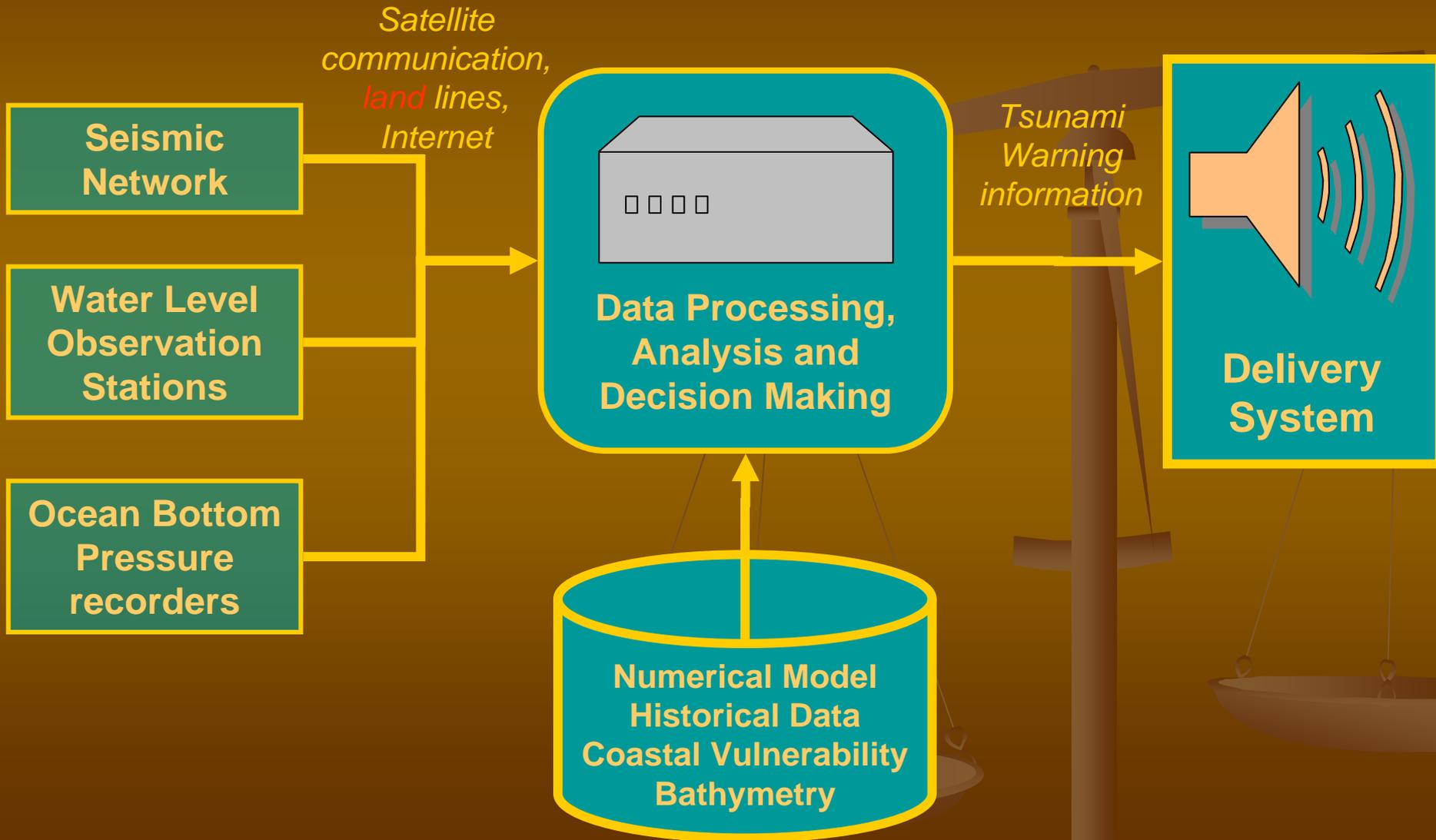
## Dissemination Component



**VIDEO WALL**      **MINI-STUDIO**

**MMD  
Emergency  
Team**

# TSUNAMI SYSTEM DESIGN CONCEPT

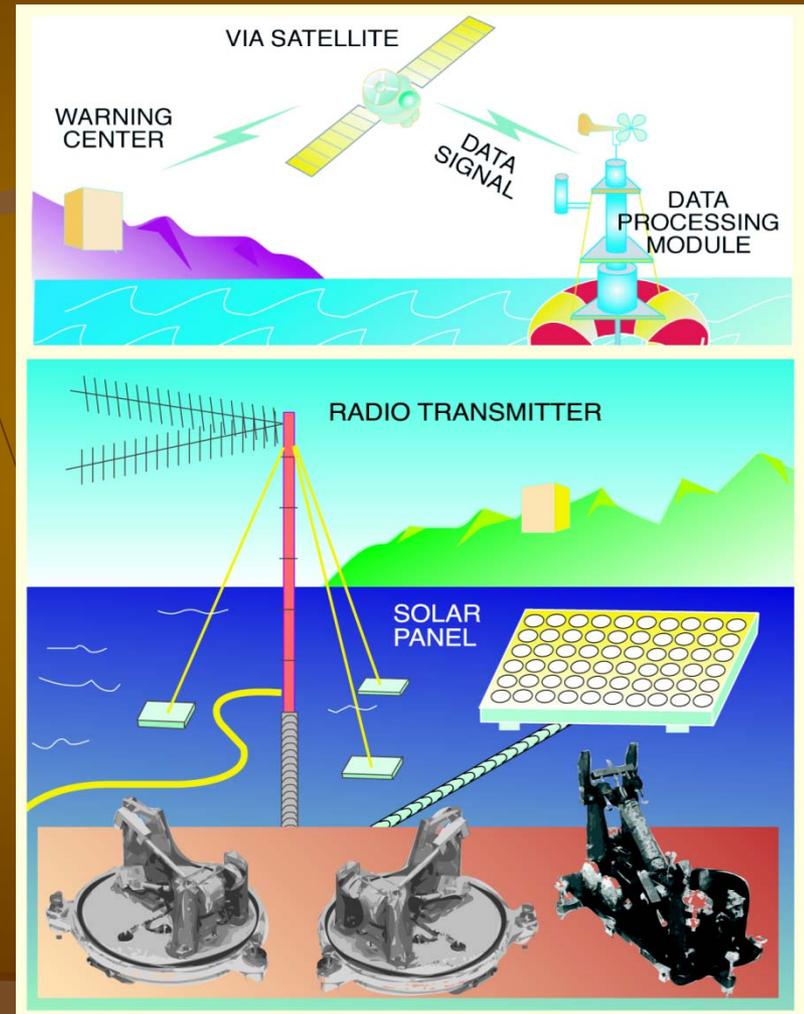


# TWO BASIC WARNING NEEDS

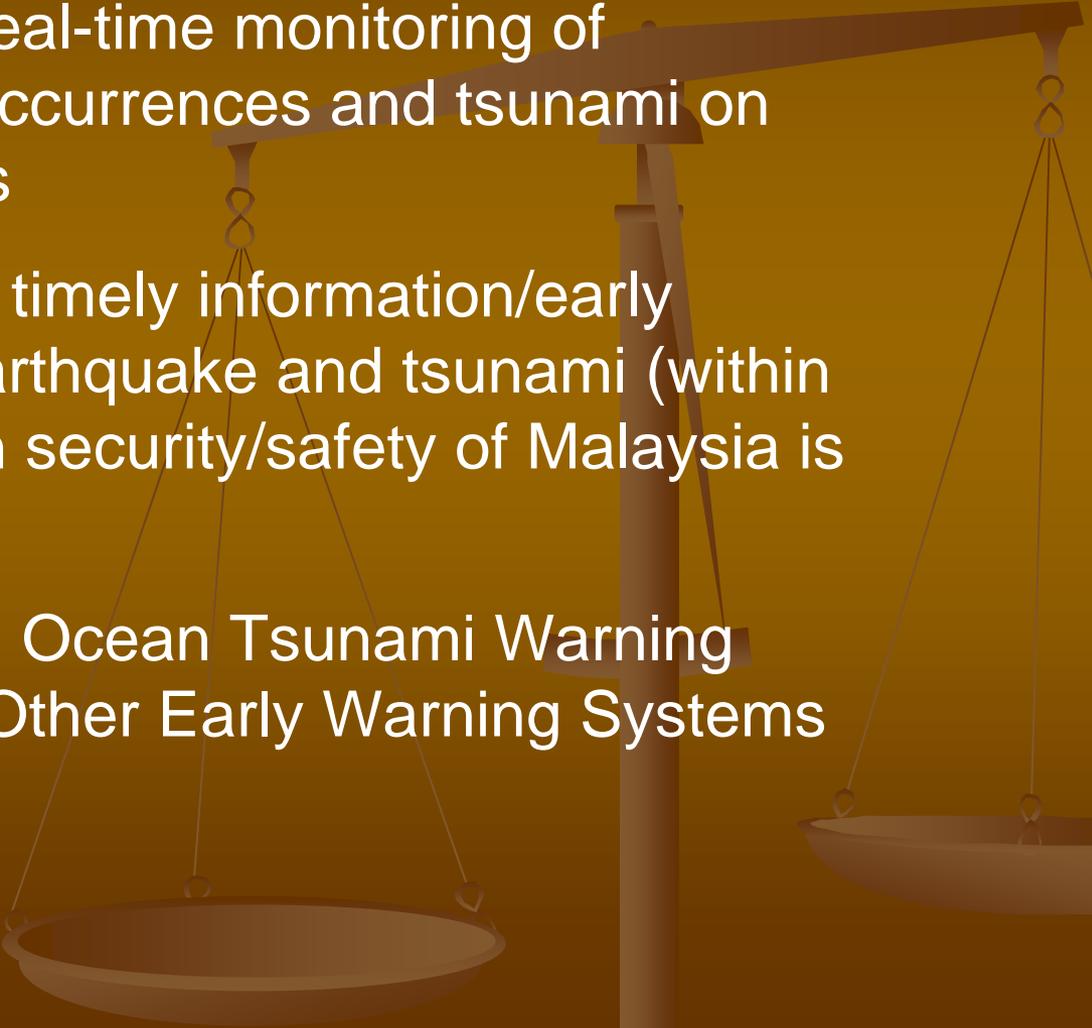
- VERY RAPID EARTHQUAKE EVALUATION
- VERY RAPID SEA LEVEL EVALUATION

*Multi-national, Global Nets  
Real-time transmission  
(Radio, microwave,  
landline/satellite phone,  
satellite, Internet)*

➤ BOTH REQUIRED  
FOR WARNING  
SYSTEM



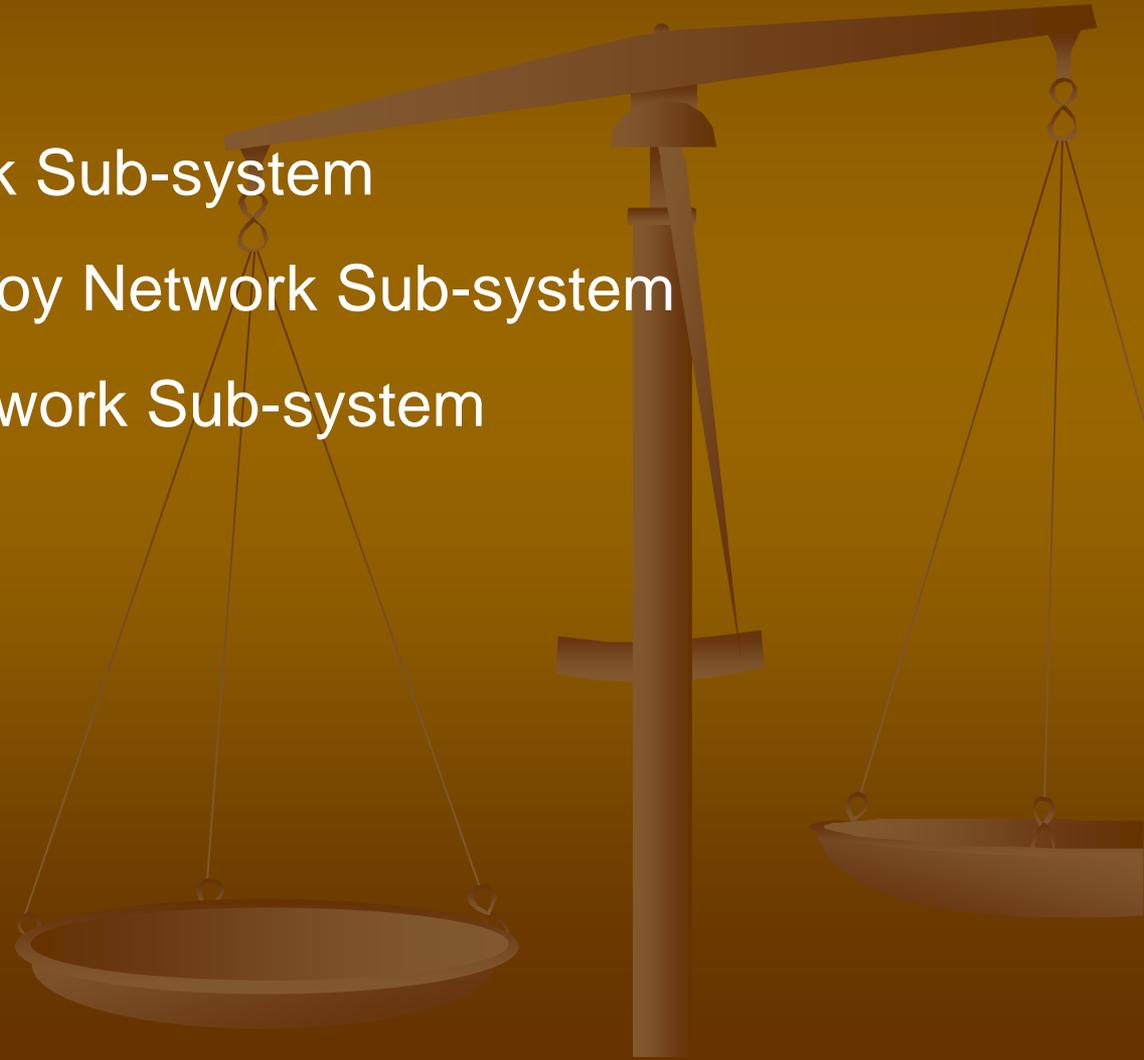
# The Need



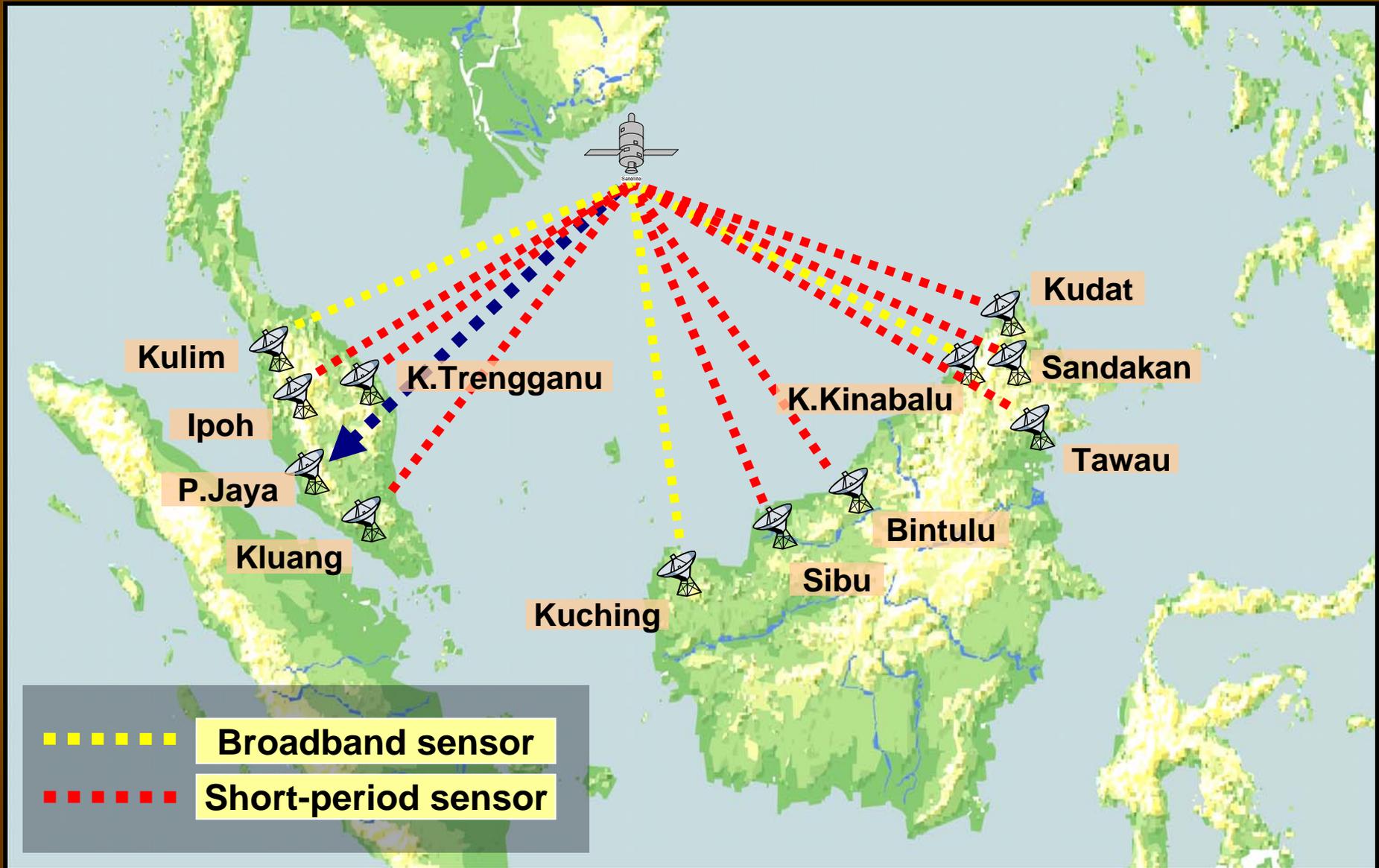
1. Continuous real-time monitoring of earthquake occurrences and tsunami on 24-hour basis
2. Effective and timely information/early warning of earthquake and tsunami (within 15 min) when security/safety of Malaysia is threatened
3. Link to Indian Ocean Tsunami Warning System and Other Early Warning Systems

# Data and Information Collection Component

1. Seismic Network Sub-system
2. Deep Ocean Buoy Network Sub-system
3. Tide Gauge Network Sub-system



# NATIONAL SEISMIC NETWORK



# NETWORK OF EXISTING TIDAL GAUGES



- MMD ( 5 Port Meteorological Stations )
- RMN ( 12 Locations )
- DSMM ( 21 Locations )

# PROPOSED NEW TIDAL GAUGES

## *SOUTH CHINA SEA*

• *Pulau Perak*

• *Pulau Dayang Bunting*

• *Pulau Pangkor*

• *Pulau Perhentian*

• *Pulau Kapas*

*Pulau Banggi* •

*Pulau Silingan* •

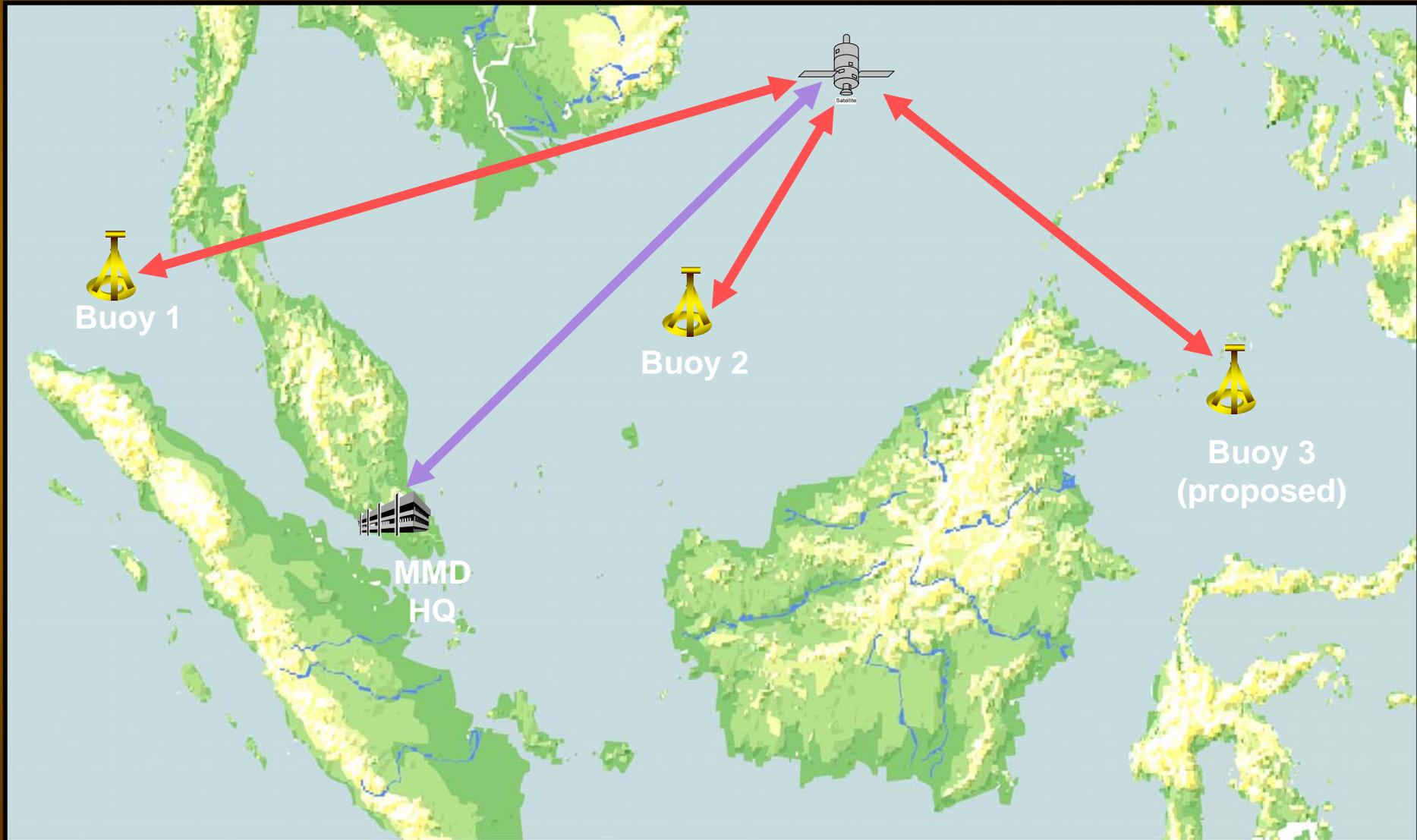
*Pulau Pandanan* •

*Pulau Mabul* •

*Pulau Sipadan* •

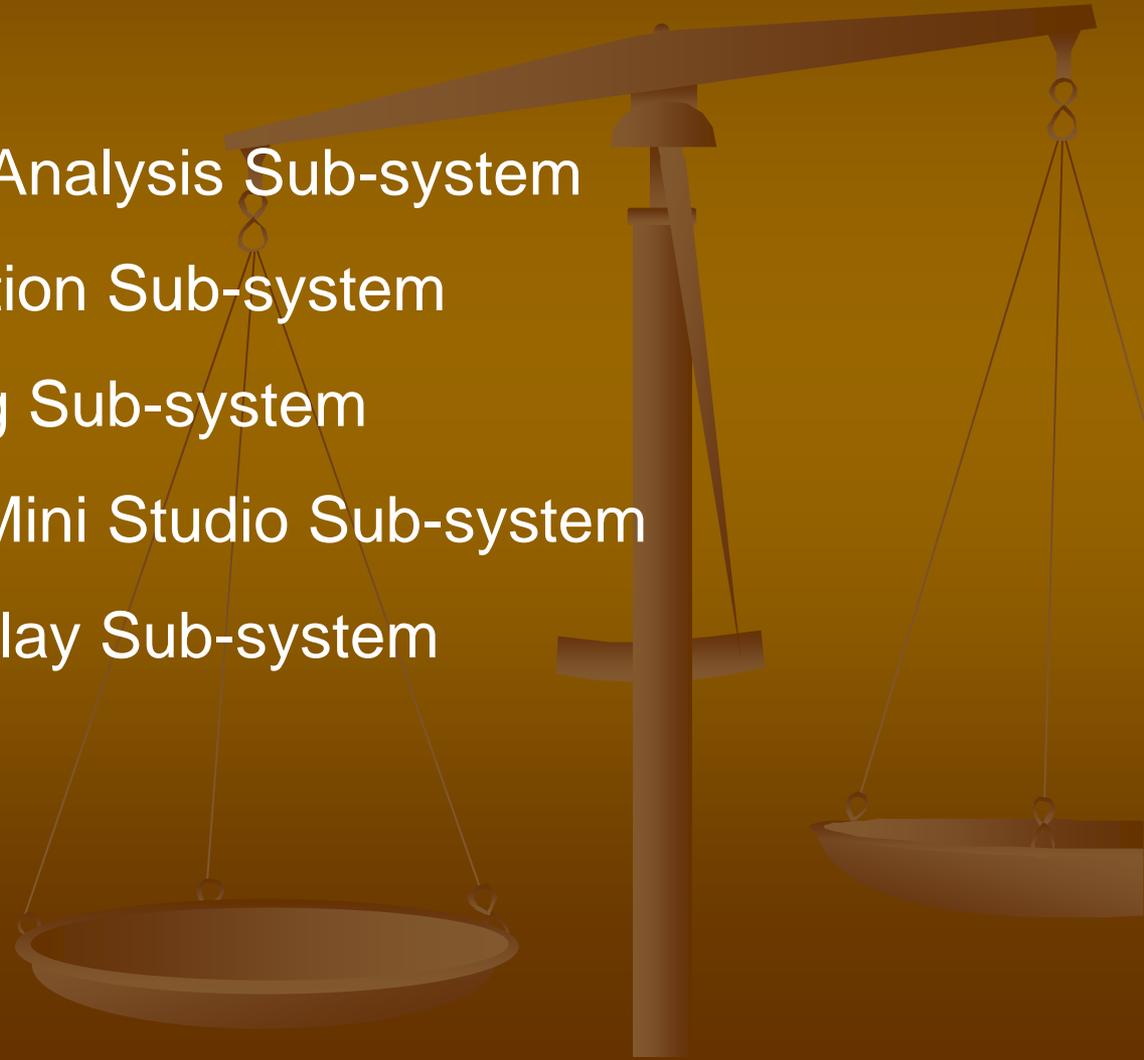


# Location of Tsunami Buoys

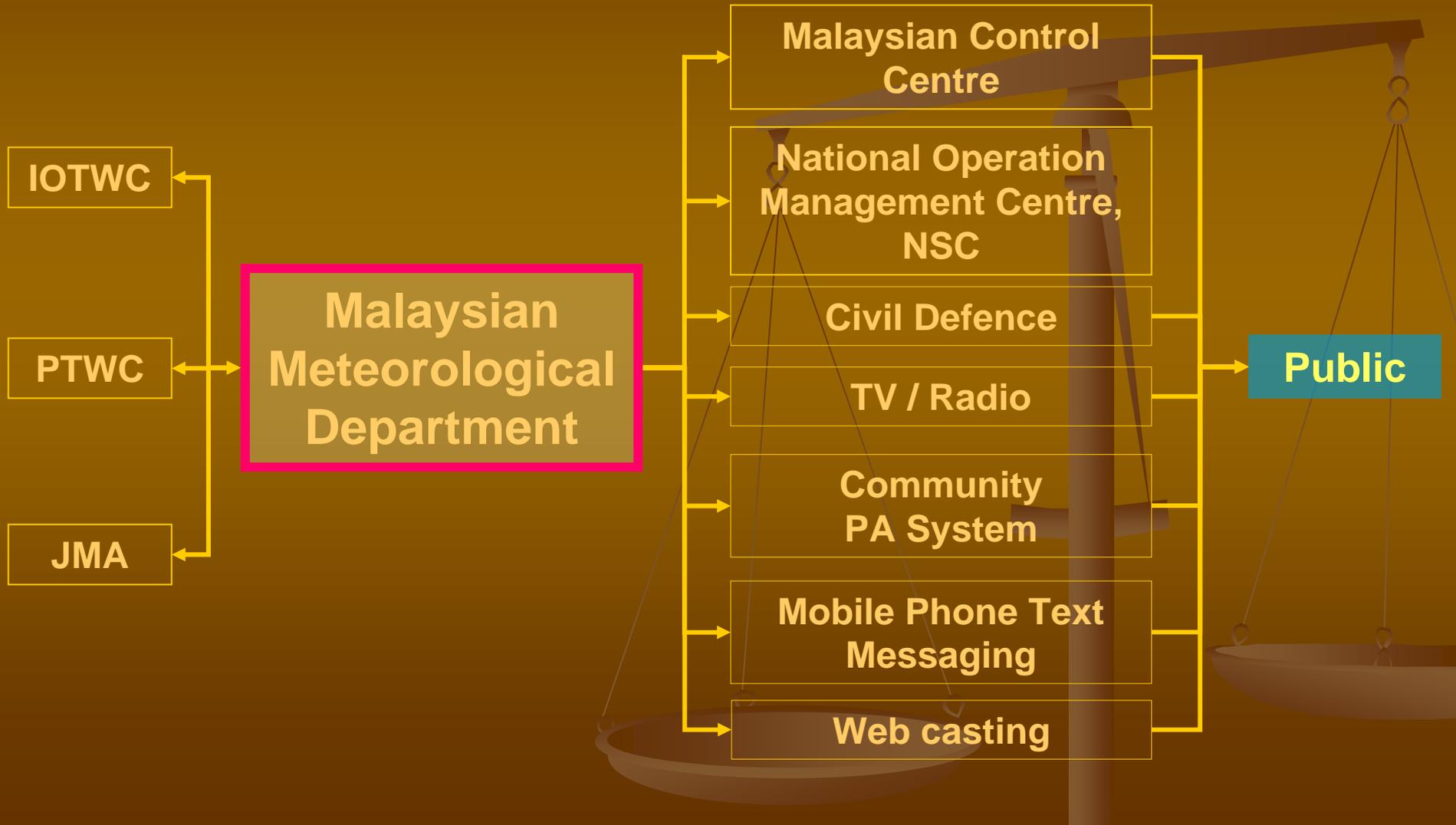


# Processing Component

1. Integration and Analysis Sub-system
2. Tsunami Prediction Sub-system
3. Decision Making Sub-system
4. Television and Mini Studio Sub-system
5. Big Screen Display Sub-system



# DISSEMINATION OF TSUNAMI WARNING TO THE PUBLIC



# EMERGENCY COMMUNICATIONS



Sirens

Emergency Alert System

Radios & TV

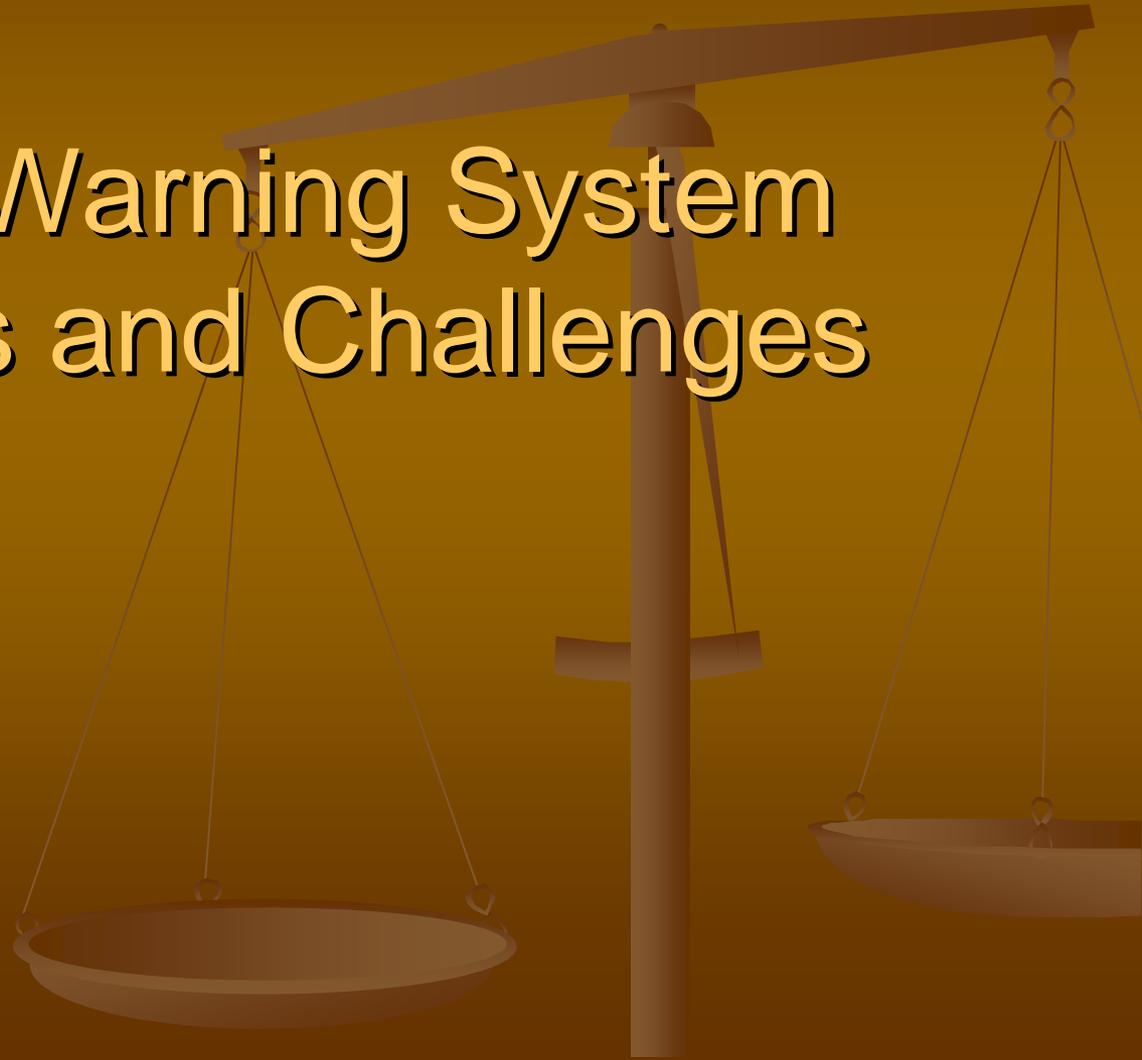
Telephone/Hotlines

Data Systems

Satellite

Mobile Phone Text Messaging

# Tsunami Warning System Limitations and Challenges

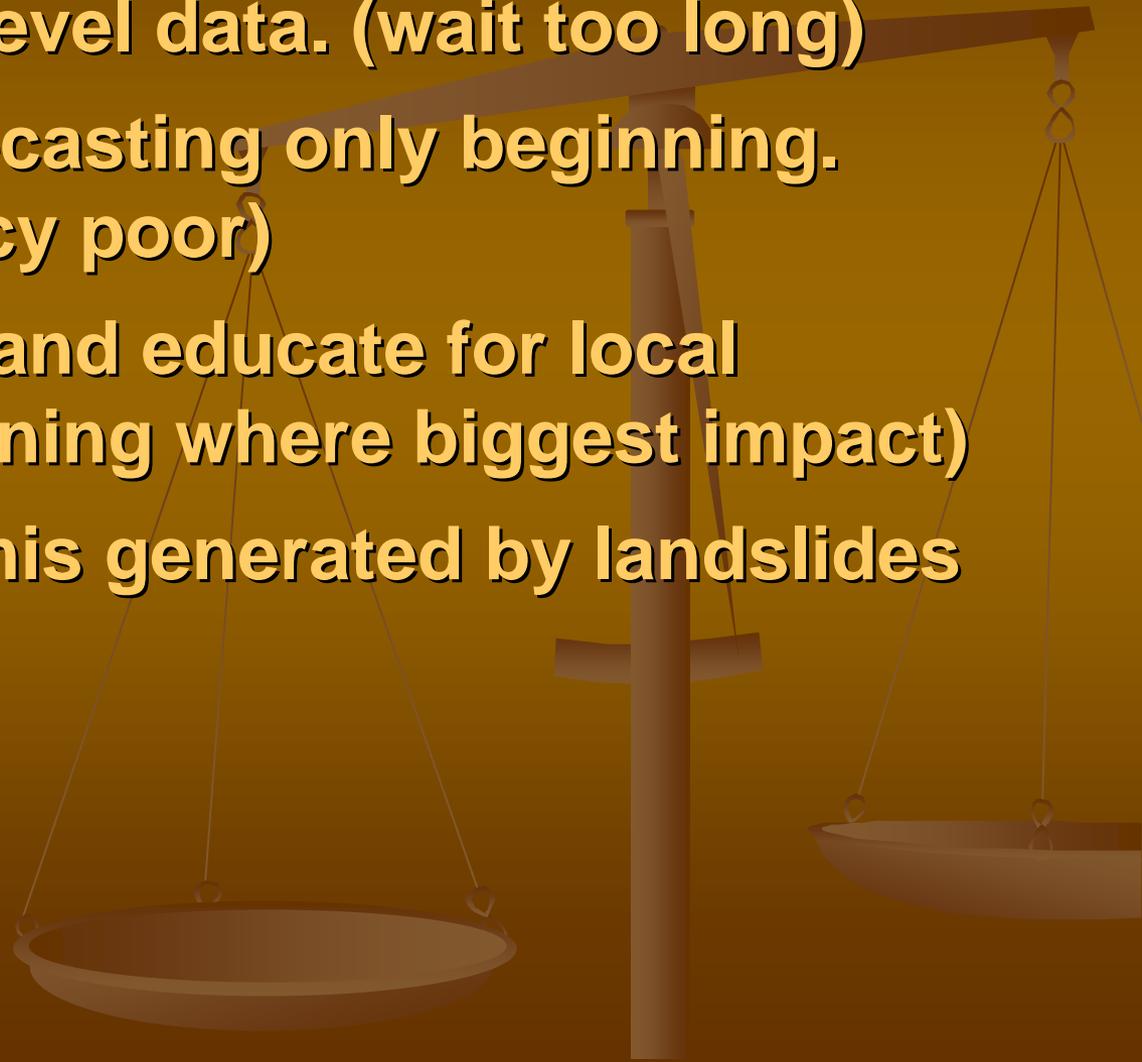


# TSUNAMI WARNING SYSTEM LIMITATIONS

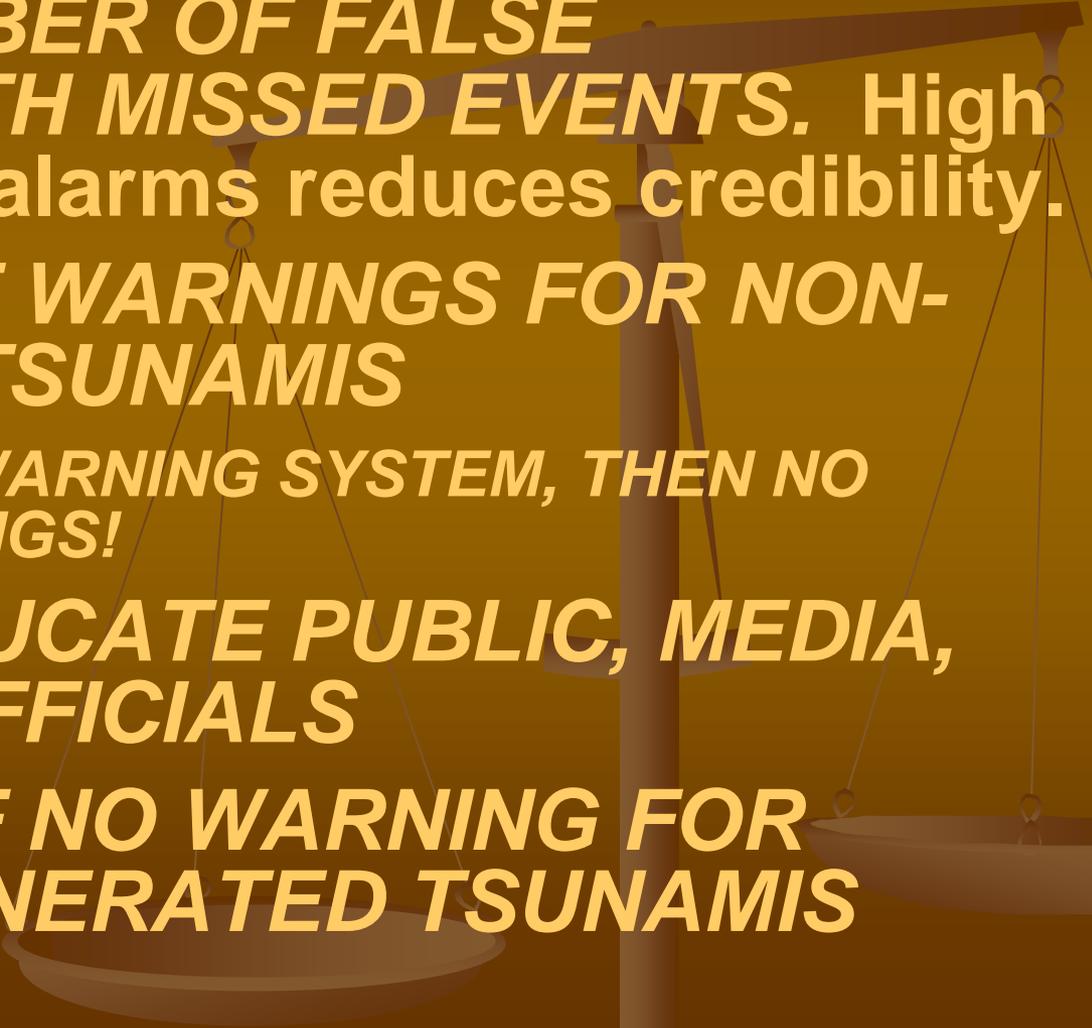
- Lead time available for a tsunami alert/warning, triggered by an earthquake occurring near Malaysia, could be very short; as little as an hour in the case of tsunamis generated within 300-400 km from our shoreline.
- Initial warnings are based solely on seismic data. Short time constraint for vigorous verification, could lead to high incidences of “false alarms” – estimated by one source to be more than 75%!

# TSUNAMI WARNING SYSTEM LIMITATIONS

- **Too sparse sea level data. (wait too long)**
- **Teletsunami forecasting only beginning. (warning accuracy poor)**
- **Difficult to warn and educate for local tsunami. (no warning where biggest impact)**
- **Can miss tsunamis generated by landslides etc. (underwarn)**



# TWS CHALLENGES

- **BALANCE NUMBER OF FALSE WARNINGS WITH MISSED EVENTS.** High number of false alarms reduces credibility.
  - **LIKELIHOOD OF WARNINGS FOR NON-DESTRUCTIVE TSUNAMIS**
    - **=> BUT, IF NO WARNING SYSTEM, THEN NO FALSE WARNINGS!**
  - **PREPARE & EDUCATE PUBLIC, MEDIA, EMERGENCY OFFICIALS**
  - **POSSIBILITY OF NO WARNING FOR LANDSLIDE-GENERATED TSUNAMIS**
- 

# National Security Council (NSC)



# Role of NSC

1. Secretariat for the Disaster Management and Relief Committees according to the level of disaster occurred
2. To ensure that the practise as well as implementation of the policy and mechanism in disaster management is carried out
3. To ensure post-mortem is carried out after occurrence of disaster
4. To activate SMART for search and rescue operations when necessary
5. To coordinate the handling of disaster management exercise as well as search and rescue from time to time
6. To monitor the implementation of disaster preventive measures and control carried out by the relevant agencies
7. To monitor the implementation of the educational, training and preventive strategies
8. To give advice to Disaster Management and Relief Committee, when requested to ensure the smooth handling and management of a disaster

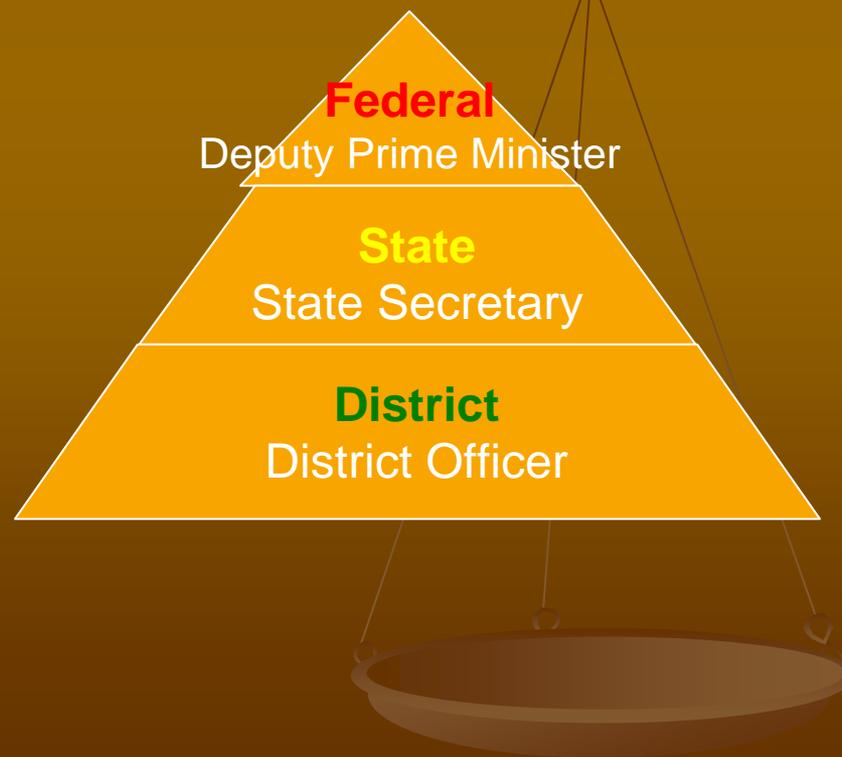
# Directive No. 20

## National Security Council

- The Policy and Mechanism on National Disaster and Relief Management established on 11th May 1997;
- Takes along the power of Law because it was signed by the Prime Minister as Directive of Operation who derive the power of His Majesty the King in the Emergency (Essential Powers) Ordinance 1970
- The aim of this Directive is to outline the Policy and Mechanism on Disaster and Relief Management on Land, according to the level of disaster and to establish a management mechanism with the purpose of determining the roles and responsibilities of the various agencies involved in handling the disaster.

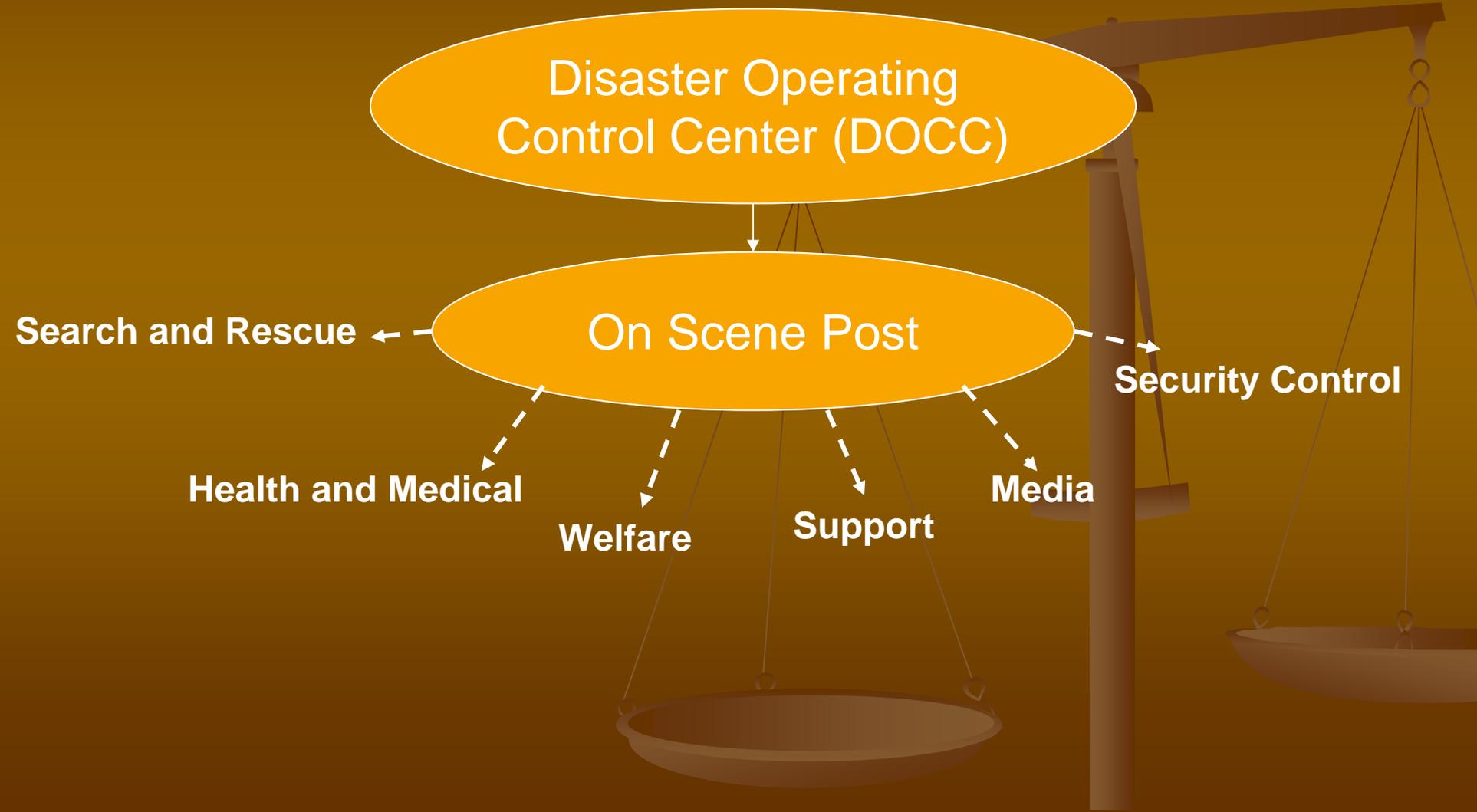
# Level of The Disaster Management and Relief Committee

- Policy and Strategic Planning
  - The District Disaster Management and Relief Committee (Level I)
  - The State Disaster Management and Relief Committee (Level II)
  - The National Disaster Management and Relief Committee (level III)



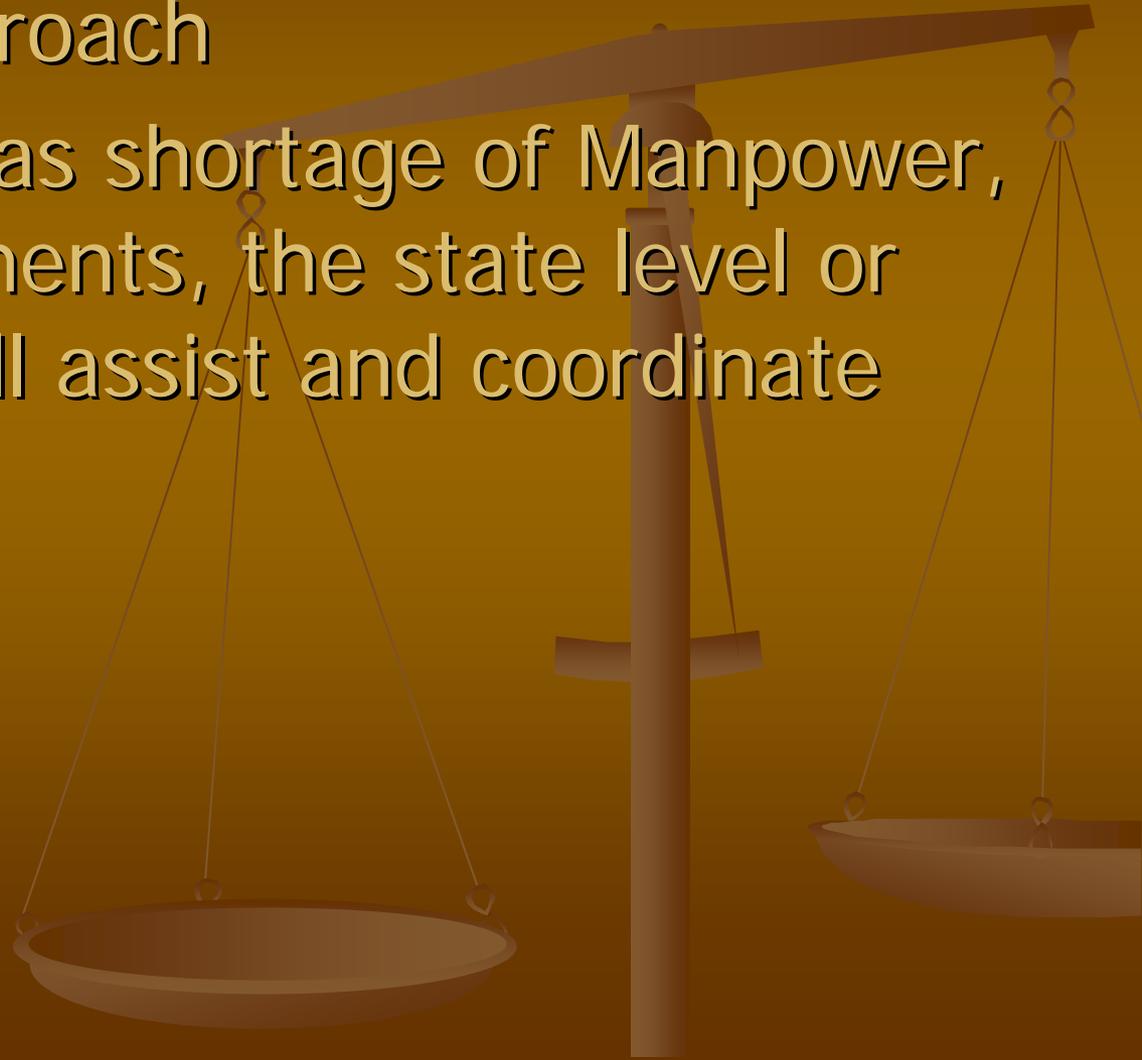
Secretariat:  
NSC

# Sub System of each level

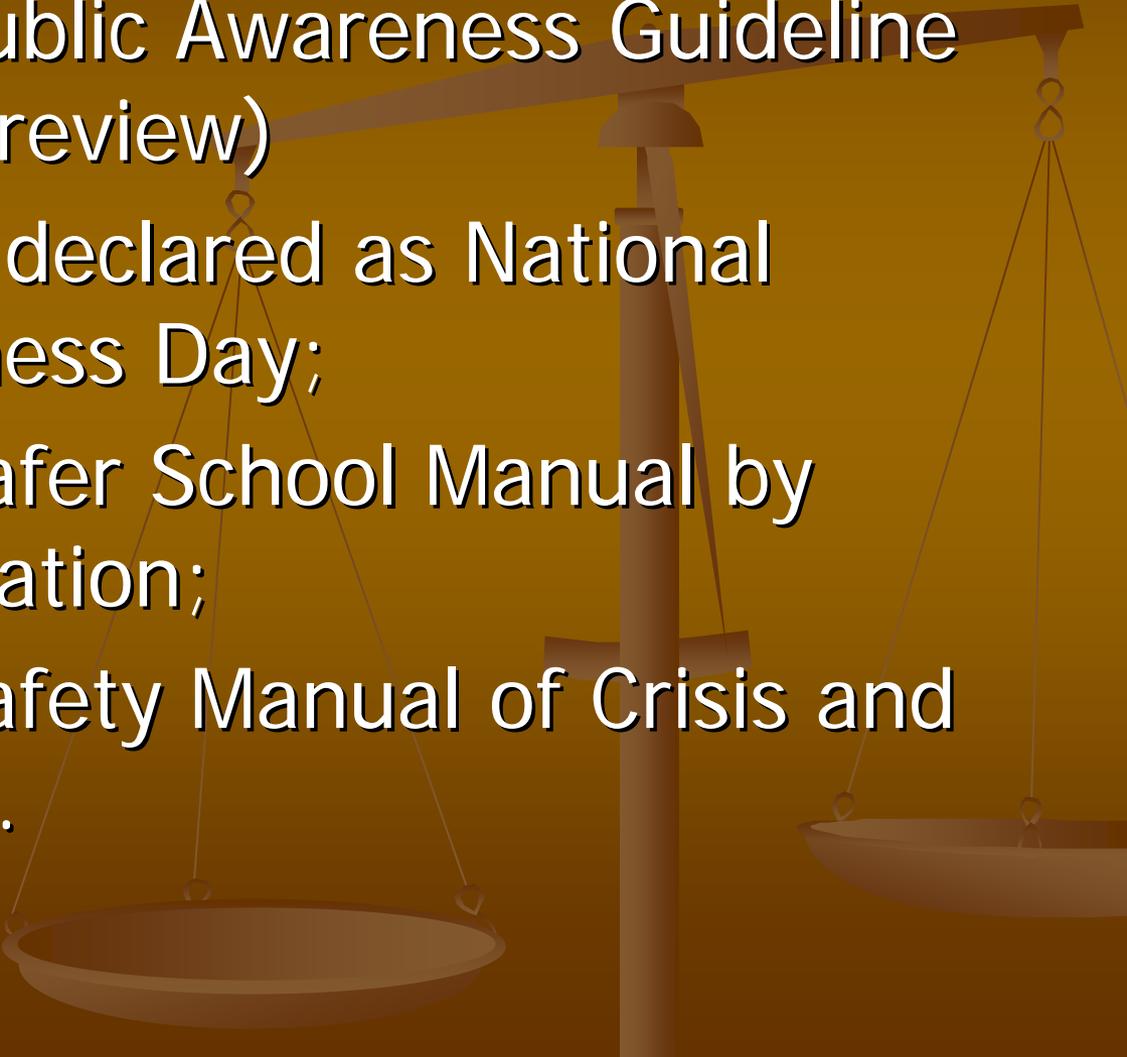


# Operational Approach

- Bottom Up Approach
- If the District has shortage of Manpower, Fund or Equipments, the state level or federal level will assist and coordinate



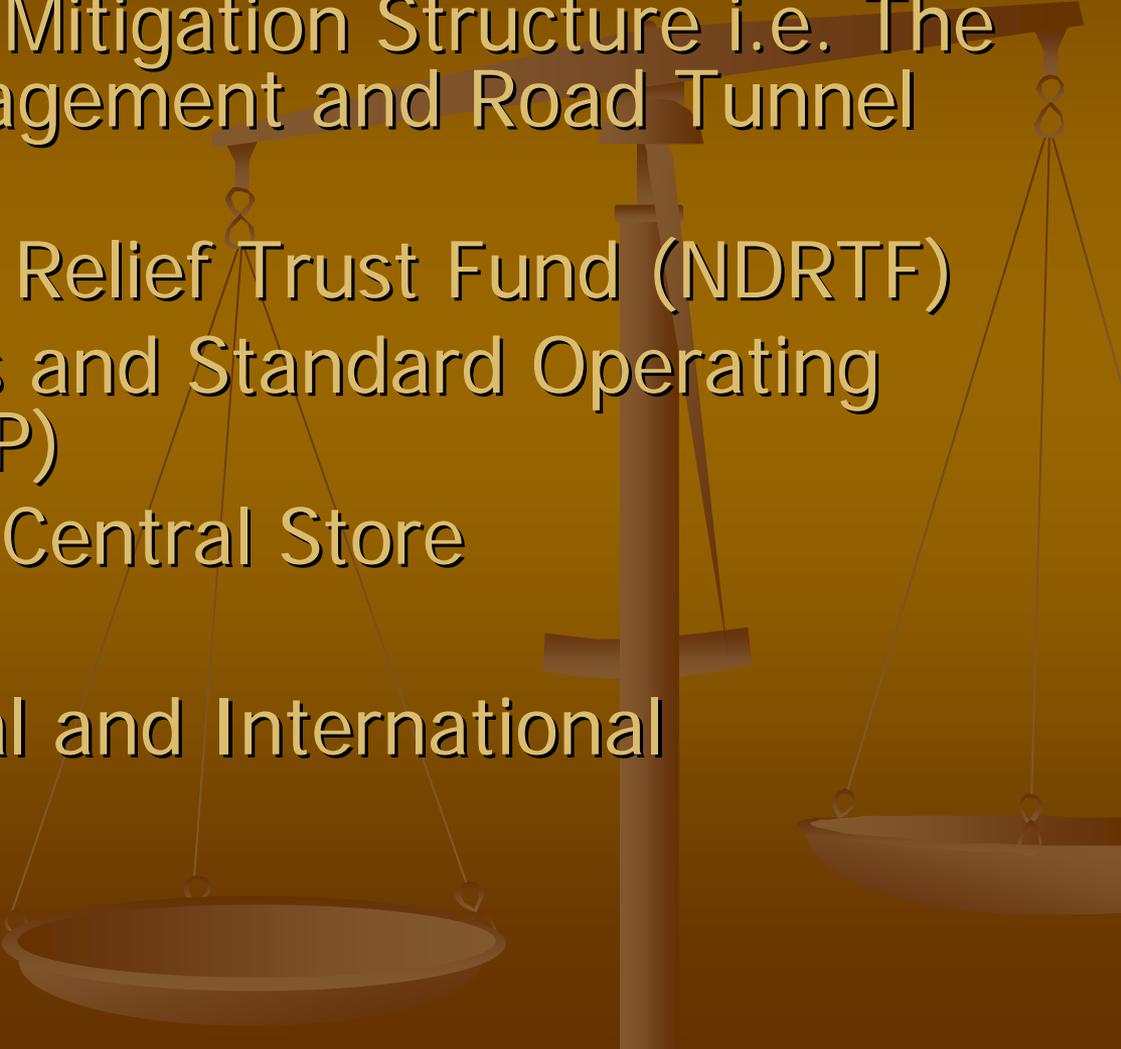
# Public Awareness Program

- Publication of Public Awareness Guideline on Disaster (on review)
  - 26 December is declared as National Disaster Awareness Day;
  - Publication of Safer School Manual by Ministry of Education;
  - Publication of Safety Manual of Crisis and Disaster by NSC.
- 

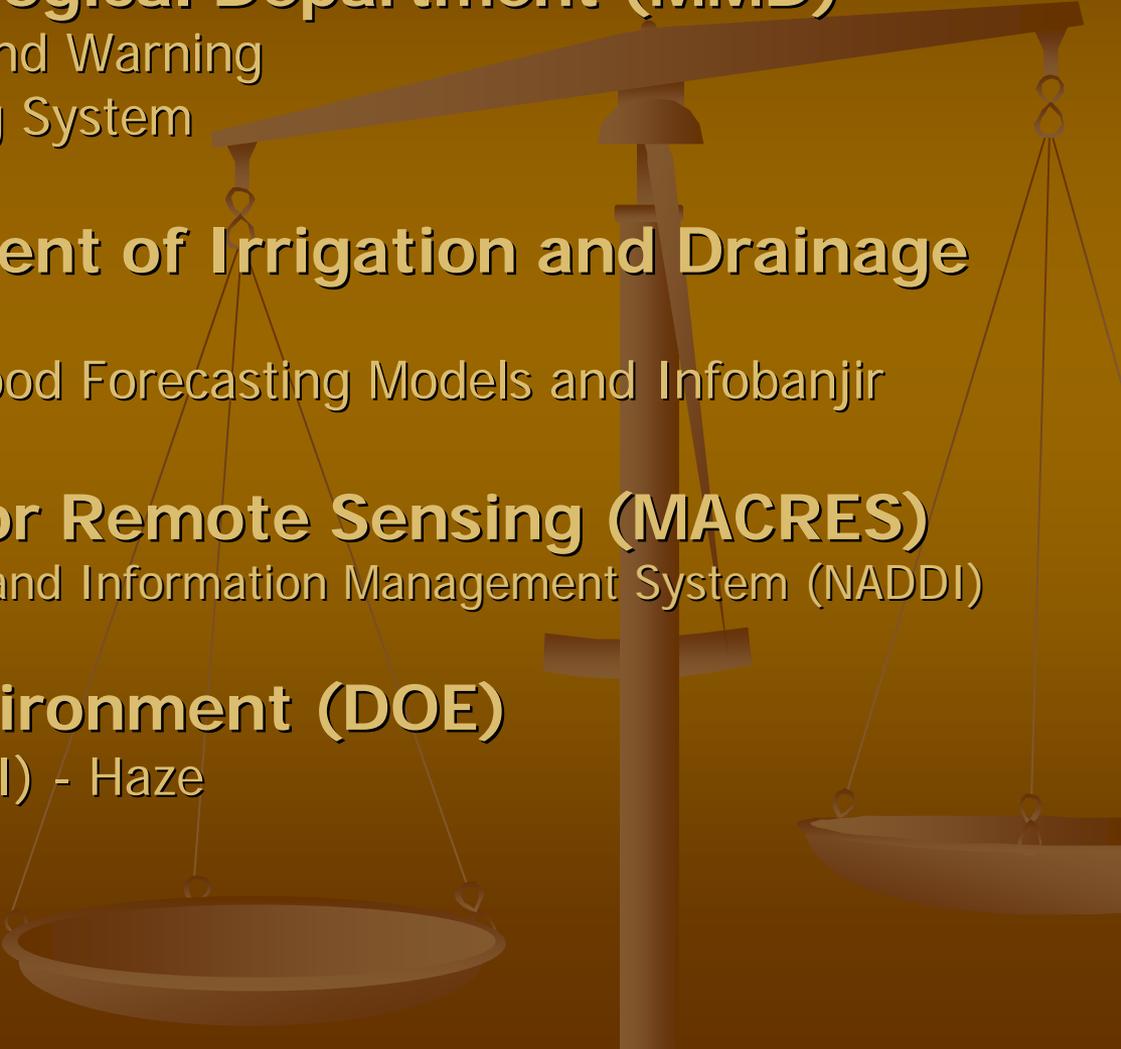
# Disaster Awareness Day 2006

- 2-Day Seminar on *“Mainstreaming Disaster Risk Reduction Into Development Policy, Planning and Implementation”*;
- Launching of *Safety Manual of Disaster and Crisis*;
- Launching of **Disaster Day’s Song**, “Dunia Semakin Usang”;
- Received contribution from other country, private sectors and NGO for **National Disaster Relief Trust Fund**;
- 26 December 2006, Kuala Lumpur.

# Preparedness

- Early Warning System
  - Structural- Flood Mitigation Structure i.e. The Stormwater Management and Road Tunnel (SMART)
  - National Disaster Relief Trust Fund (NDRTF)
  - Policy, Guidelines and Standard Operating Procedures (S.O.P)
  - Establishment of Central Store
  - Capacity Building
  - Bilateral, Regional and International Cooperation
- 

# Early Warning System



- **Malaysian Meteorological Department (MMD)**
  - Weather Forecasting and Warning
  - Tsunami Early Warning System
- **Malaysian Department of Irrigation and Drainage (DID)**
  - Telemetry System - Flood Forecasting Models and Infobanjir
- **Malaysian Centre for Remote Sensing (MACRES)**
  - National Disaster Data and Information Management System (NADDI)
- **Department of Environment (DOE)**
  - Air Pollutant Index (API) - Haze

# Malaysian Tsunami Early Warning System

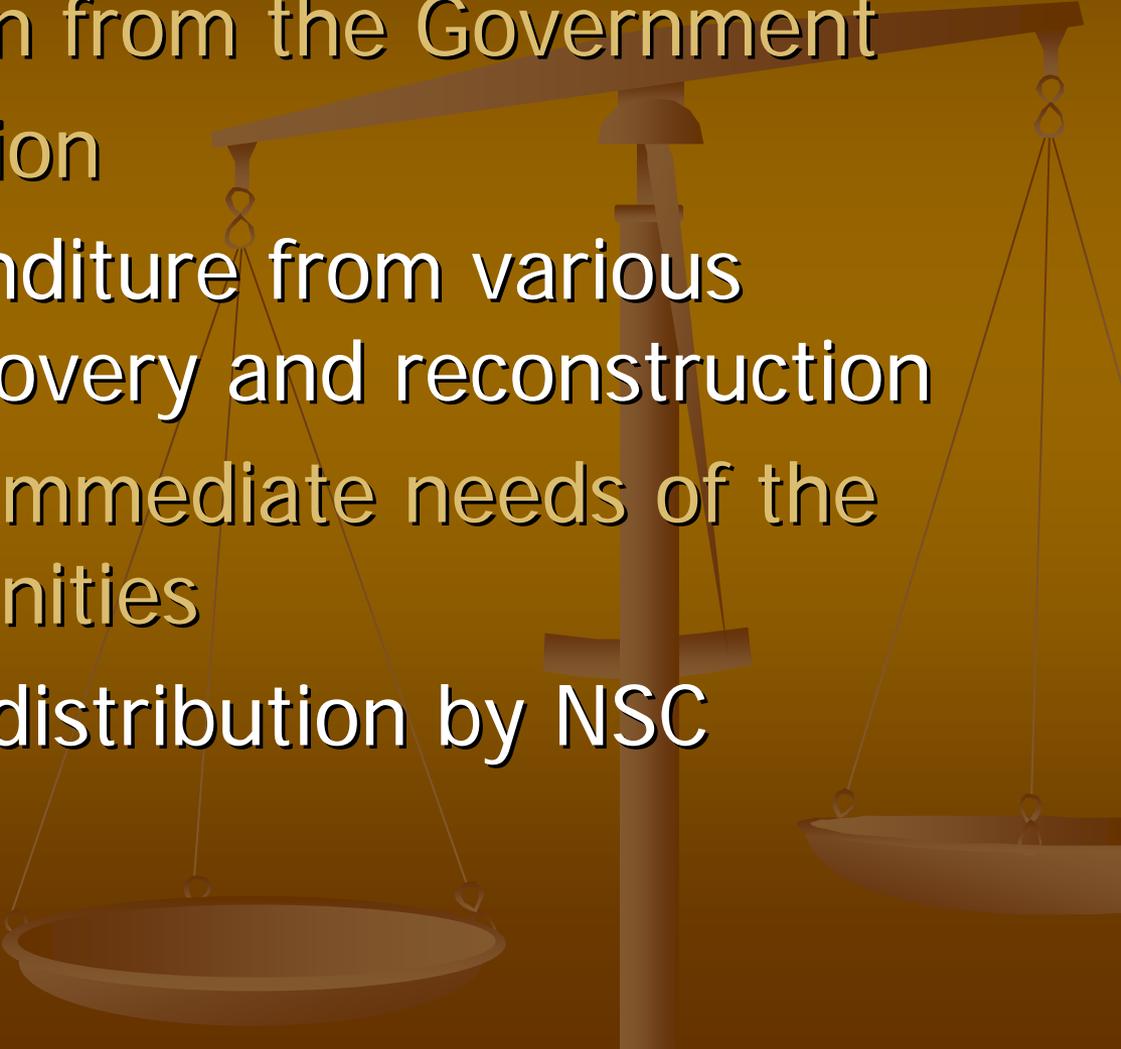
- After the Asian Tsunami in Dec 2004
- Developed by Malaysian Meteorological Dept.
- Three technologically advanced deep water buoys to be deployed at locations around Malaysia.
- The first buoy was installed near Pulau Rondo, Sumatra on 30 December 2005
- The second buoy installed at Peninjau Island on the South China Sea in early March 2006
- The third buoy proposed to deploy in the Sulu/ Celebes Sea.
- Dissemination System: Short Messaging System (SMS), mass media, telephone, fax and website

# The Stormwater Management and Road Tunnel (SMART)

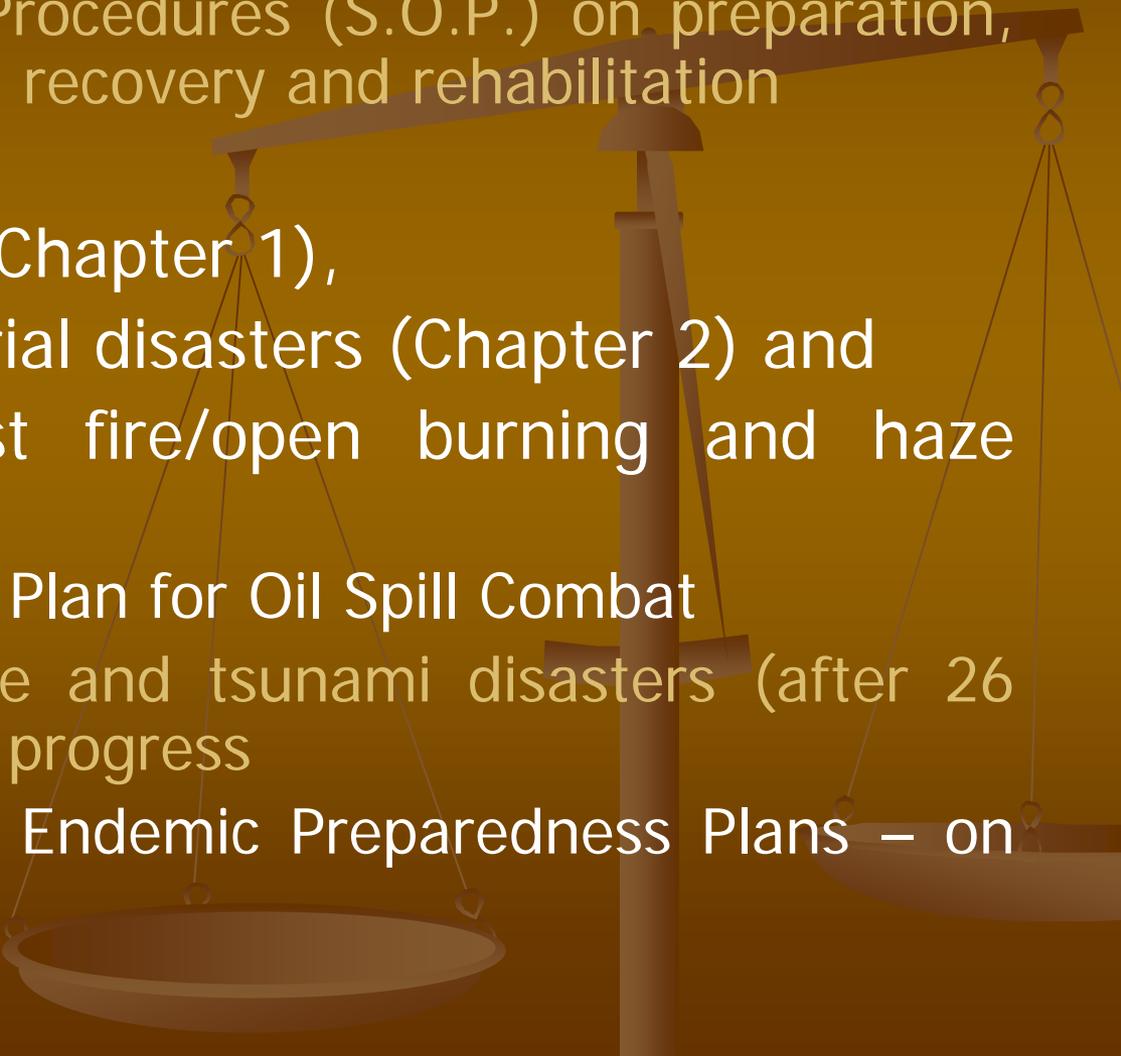
- Jointly project between Department of Drainage and Irrigation and the Highway Authority of Malaysia
- Inner diameter 11.8m, distance 9.7km
- diverting the water into the river downstream
- Dual function i.e. for motorway during normal days and water drainage during heavy rain/flood.



# National Disaster Relief Trust Fund (NDRTF)

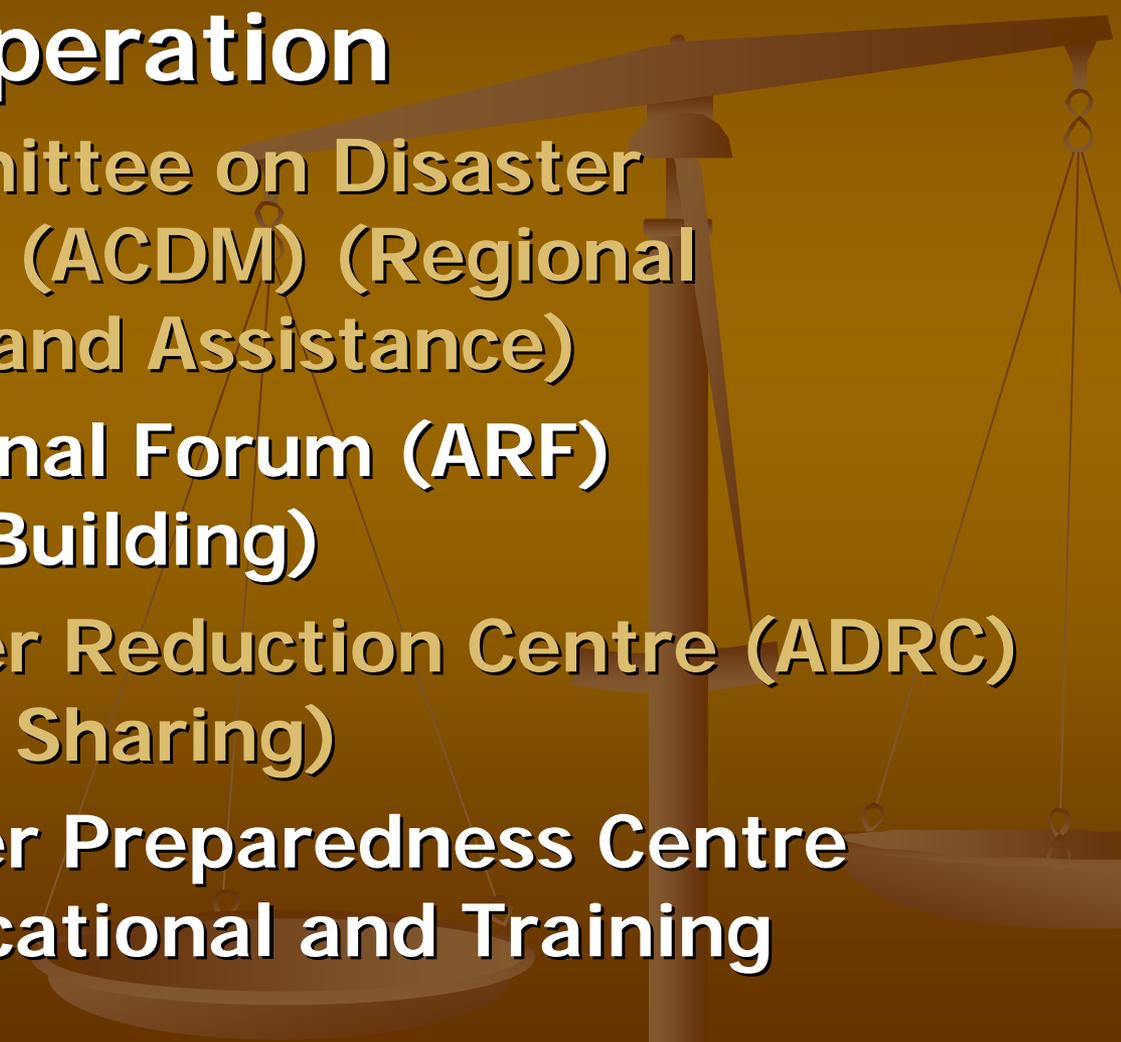
- Annual allocation from the Government
  - Public Contribution
  - Operating Expenditure from various agencies for recovery and reconstruction
  - To address the immediate needs of the affected communities
  - Monitoring and distribution by NSC
- 

# Standard Operating Procedures

- Standard Operating Procedures (S.O.P.) on preparation, prevention, response, recovery and rehabilitation
  - Three major S.O.P.
    - S.O.P. for flood (Chapter 1),
    - S.O.P. for industrial disasters (Chapter 2) and
    - S.O.P. for forest fire/open burning and haze (Chapter 3).
  - National Contingency Plan for Oil Spill Combat
  - S.O.P. for earthquake and tsunami disasters (after 26 December 2004) – in progress
  - S.O.P. on Pandemic/ Endemic Preparedness Plans – on revision
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# Bilateral, Regional and International Cooperation

## Regional Cooperation

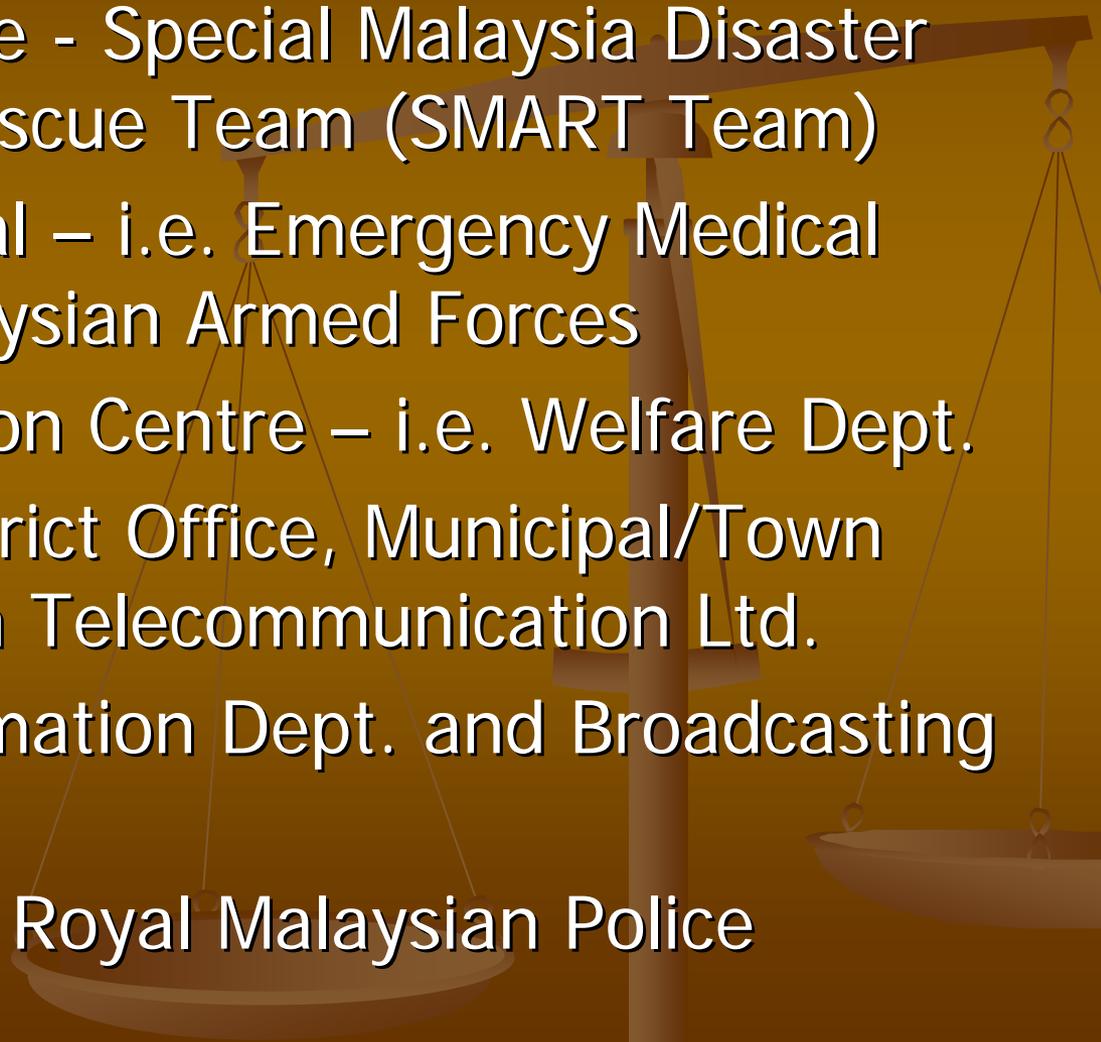
- ASEAN Committee on Disaster Management (ACDM) (Regional Cooperation and Assistance)
  - ASEAN Regional Forum (ARF) (Confidence Building)
  - Asian Disaster Reduction Centre (ADRC) (Information Sharing)
  - Asian Disaster Preparedness Centre (ADPC) (Educational and Training Cooperation)
- 

# Bilateral, Regional and International Cooperation

## International Cooperation

- FEMA – (USA) (International Networking)
  - United Nations – International Search and Rescue Advisory Groups (UN – INSARAG) (Humanitarian Assistance Networking)
  - Typhoon Committee (Mitigation, Coordination and Early Warning Cooperation)
  - Participating in UN-ISDR (United Nations – International strategy for Disaster Reduction).
  - Malaysian Meteorological Department (MMD) – World Meteorological Organization
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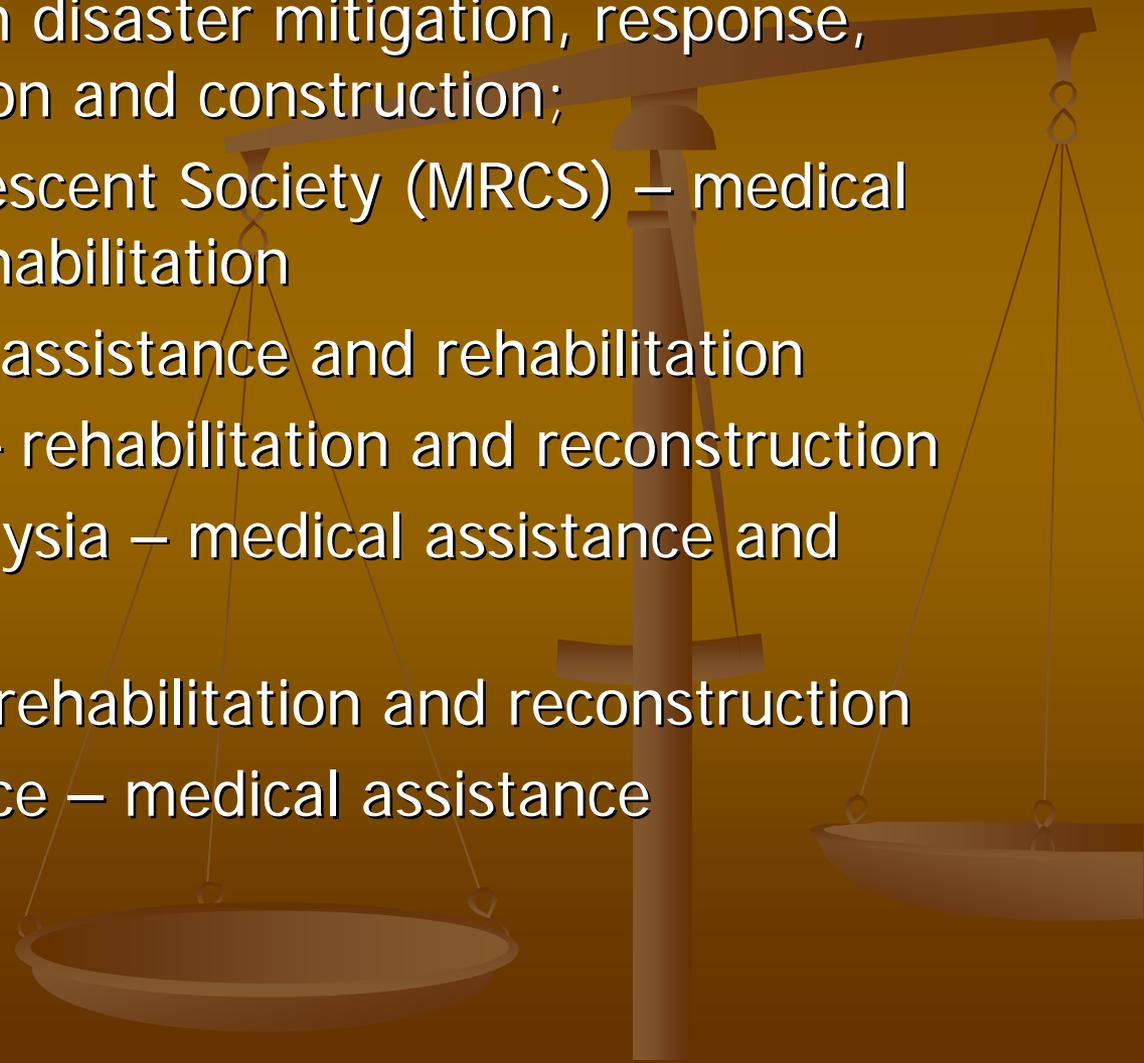
# Response and Relief

- Search and Rescue - Special Malaysia Disaster Assistance and Rescue Team (SMART Team)
  - Health and Medical – i.e. Emergency Medical Services and Malaysian Armed Forces
  - Welfare/ Evacuation Centre – i.e. Welfare Dept.
  - Support – i.e. District Office, Municipal/Town Council, Malaysian Telecommunication Ltd.
  - Media – i.e. Information Dept. and Broadcasting Dept.
  - Security Control – Royal Malaysian Police
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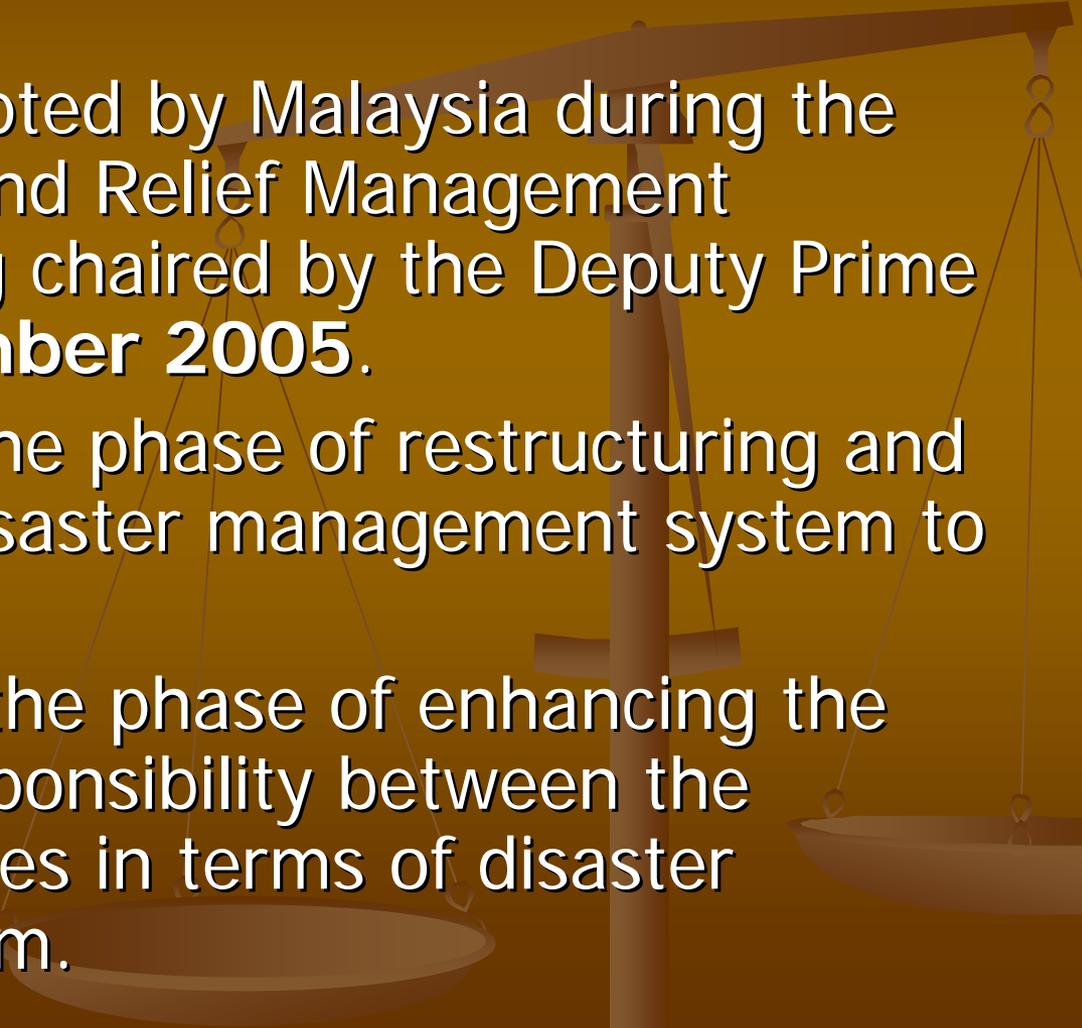
# Role of Non Government Organization (NGOs)

To provide assistance in disaster mitigation, response, recovery, rehabilitation and construction;

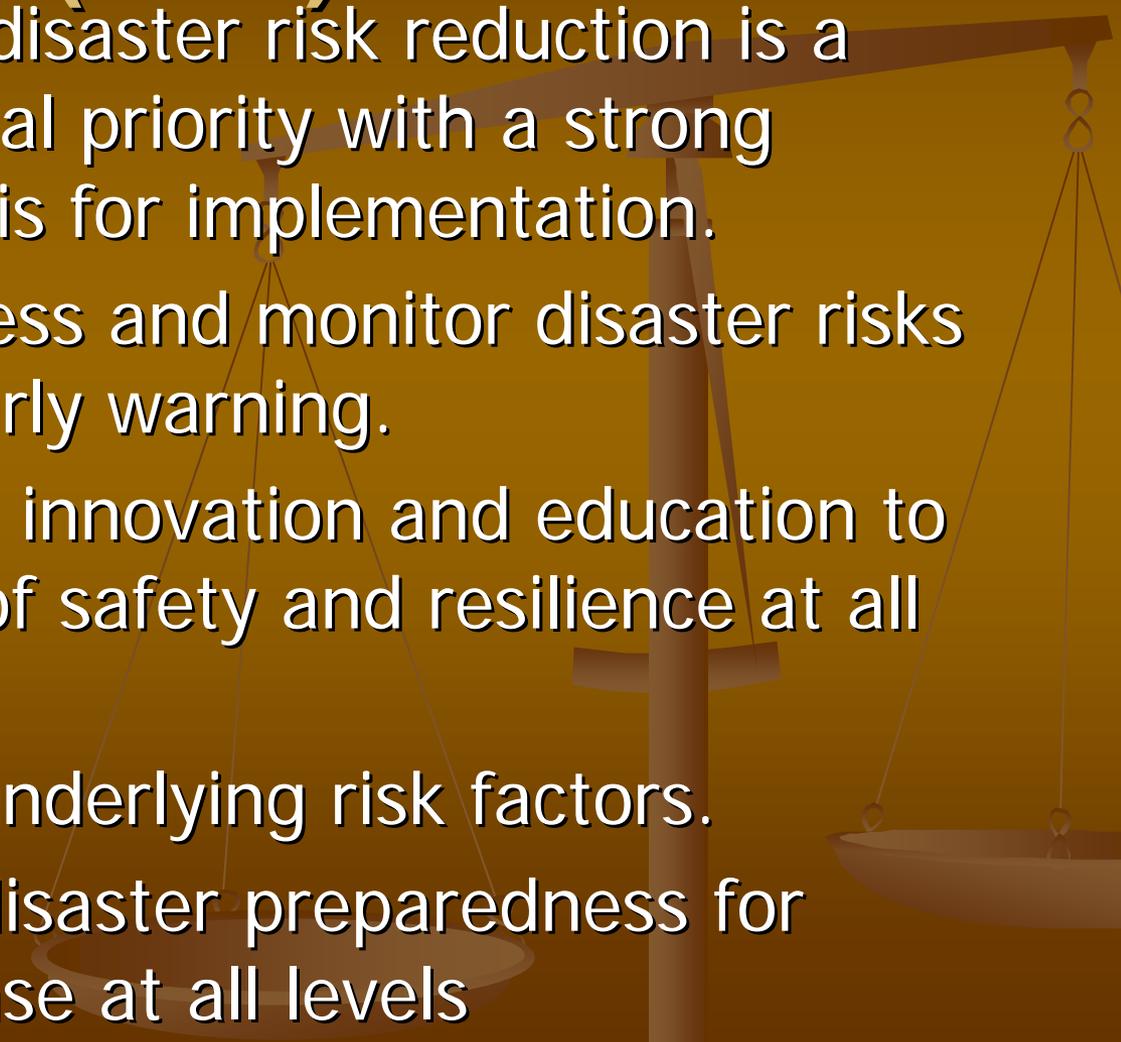
- Malaysian Red Crescent Society (MRCS) – medical assistance and rehabilitation
- MERCY – medical assistance and rehabilitation
- Haluan Malaysia – rehabilitation and reconstruction
- Global Peace Malaysia – medical assistance and rehabilitation
- AMAN Malaysia – rehabilitation and reconstruction
- St. John Ambulance – medical assistance



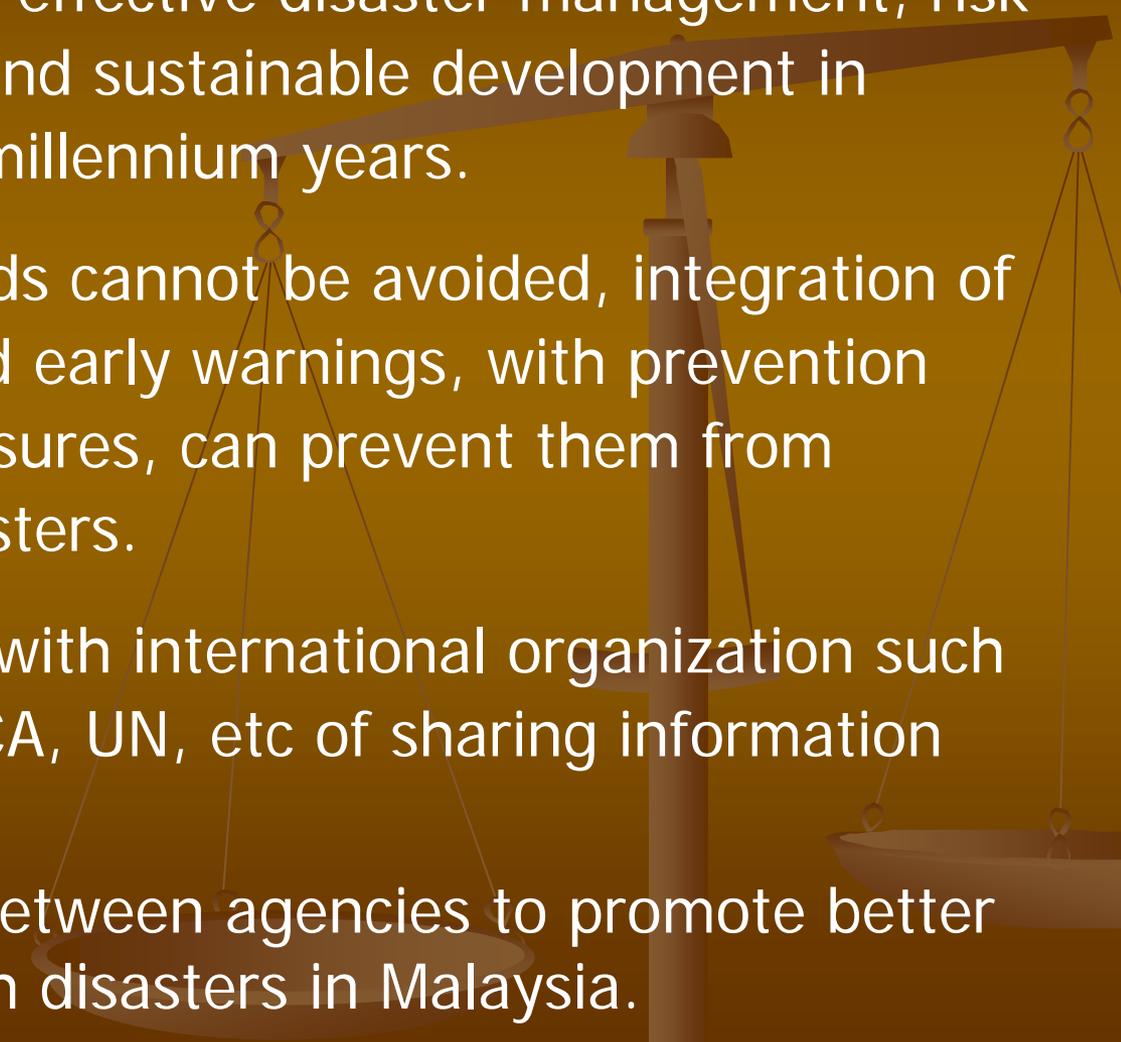
# Progress and Situations of the Hyogo Framework for Action (HFA)

- HFA had been adopted by Malaysia during the National Disaster and Relief Management Committee Meeting chaired by the Deputy Prime Minister on **November 2005**.
  - Malaysia is still in the phase of restructuring and reorganizing the disaster management system to fit in the HFA.
  - Malaysia is also in the phase of enhancing the coordination of responsibility between the government agencies in terms of disaster management system.
- 

# Progress and Situations of the Hyogo Framework for Action (HFA)

- To ensure that disaster risk reduction is a national and local priority with a strong institutional basis for implementation.
  - To identify, assess and monitor disaster risks and enhance early warning.
  - Use knowledge, innovation and education to build a culture of safety and resilience at all levels.
  - To reduce the underlying risk factors.
  - To strengthen disaster preparedness for effective response at all levels
- 

# Conclusion

- ❑ Malaysia hopes to create a safer environment for the community through effective disaster management, risk reduction concept and sustainable development in going through the millennium years.
  - ❑ Since natural hazards cannot be avoided, integration of risk assessment and early warnings, with prevention and mitigation measures, can prevent them from escalating into disasters.
  - ❑ Good collaboration with international organization such as ADRC, WMO, JICA, UN, etc of sharing information and technologies.
  - Good cooperation between agencies to promote better ways in dealing with disasters in Malaysia.
- 



# ADRC

**Asian Disaster Reduction Center  
(ADRC)**

**Thank you for your kind  
attention**

**TERIMA KASIH**

**ありがとう**

