



World Meteorological Organization

Working together in weather, climate and water

# Training Workshop on Multi-Hazard Early Warning Systems with Focus on Institutional Coordination and Cooperation

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Pula, Croatia

October 1 – 3, 2009



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# **1. Background and Objectives of the Training Workshop on Multi-Hazard Early Warning Systems with focus on Institutional Coordination and Cooperation**

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# Simplified Schematic of a Comprehensive National Disaster Risk Management Programme

**a paradigm shift ...**

Alignment of national to local policies, legislation, planning, resources  
multi-sectoral organizational coordination and collaboration

## Risk Identification

Historical and real-time data

Hazard statistics

Climate forecasting and trend analysis

Exposed assets & vulnerability

Risk analysis tools

## Risk Reduction

**PREPAREDNESS:**  
**early warning systems**  
emergency planning

**MITIGATION AND PREVENTION:**  
Medium to long term sectoral planning (e.g. zoning, infrastructure, agriculture)

## Risk Transfer

CAT insurance & bonds  
Weather-indexed insurance and derivatives  
Other emerging products

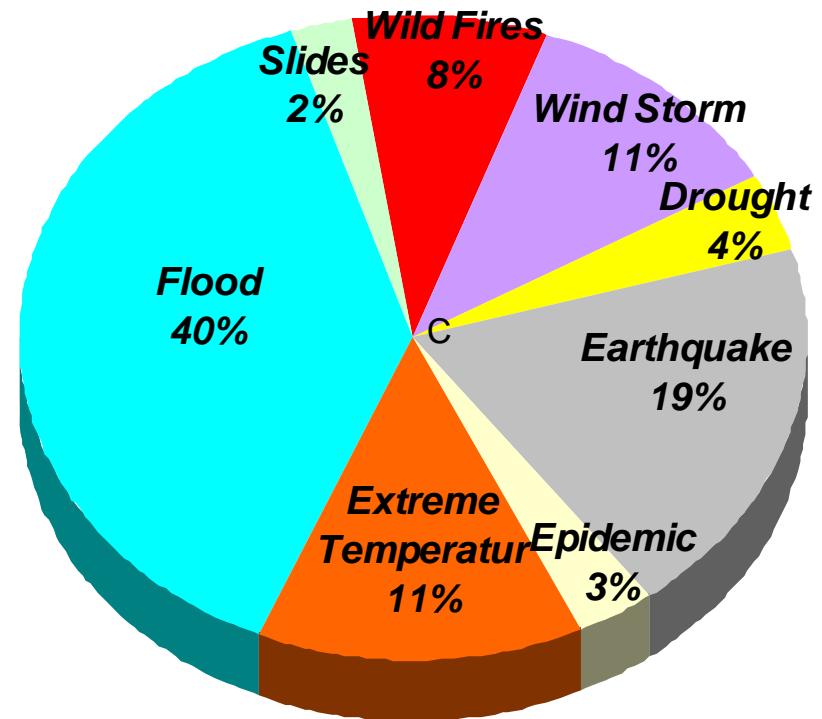
Information and Knowledge Sharing  
Education and training



# Distribution of Disasters Caused by Natural Hazards and their Impacts (1980-2007) in SEE

**81% of disasters events are related to hydro-meteorological hazards and conditions.**

Number of events - 1980-2007 (SEE)





# South Eastern Europe Disaster Risk Mitigation and Adaptation Programme

World Bank / ISDR / WMO / UNDP Programme – initiated in 2007

- **Three Components:**
  - Risk Management Capacities
  - Hydro meteorological services
  - Catastrophe Insurance facility and financial risk transfer

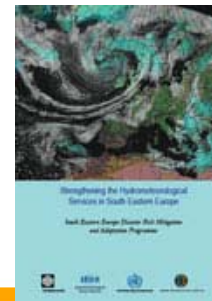


- **11 countries:**

Albania, Bosnia & Herzegovina, Bulgaria, Croatia, FYR Macedonia, Moldova, Montenegro, Romania, Serbia, KOSOVO (as defined by UNSCR 1244/99), Slovenia, Turkey

## Phase I: Assessments

- Detailed national assessment
- Funded by GFDRR





# SEEDRMAP Phase II

## EC Enlargement Project

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- **Regional Programme on Disaster Risk Reduction in SEE**  
(EC DG Enlargement 2 M €funding)

### 8 Countries

Albania, Bosnia & Herzegovina, Croatia, FYR of Macedonia, Montenegro, Serbia, Kosovo (as defined by UNSCR 1244/99), Turkey

- **UNDP Component 1:** Building Capacity in Disaster Risk Reduction through Regional Cooperation and Collaboration in South East Europe
- **WMO Component 2:** Regional Cooperation in South East Europe for meteorological, hydrological and climate data management and exchange to support Disaster Risk Reduction

- **World Bank National DRR Projects**
    - Albania, Croatia, Moldova
-



# **SEEDRMAP Phase II**

## **EC Enlargement Project**

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- **To facilitate the establishment of a Regional Strategy for Disaster Risk Reduction in the Western Balkans and Turkey.**
  - **To support development of national platforms**
  - **To increase the availability of reliable regional level data that is crucial for Vulnerability Assessment, Disaster Planning and **Early Warning**.**
  - **To enhance contribution of NMHS to DRR at national and regional levels.**
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# Expected Outcomes of the SEE Project

WITH  
UNDP

- National experts are trained in:
  - Multi-Hazard Early Warning Systems
  - Flood hazard data, metadata and mapping tools
  - Drought hazard data, metadata and mapping tools
- National proposals prepared for:
  - development of Early Warning Systems
  - development of risk assessment capacities
- Proposal for concrete initiatives for regional cooperation in SEE region





# Major Milestones and Timeline

## Activities 1.1 – 2

(For more information see attached Gant Chart)

### Activity 1.1: National Policy Dialogues

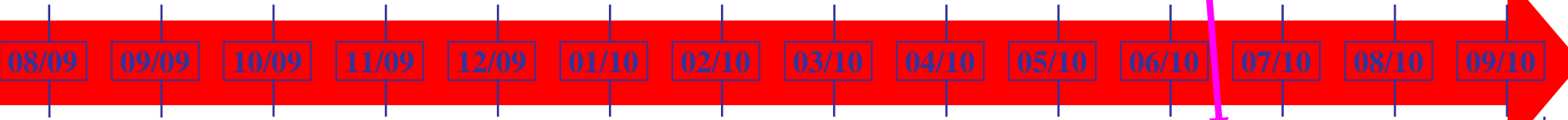
Country Assessment Missions

National Policy Dialogues

National Proposals

### Activity 1.3: Regional Workshop on MHEWS

MHEWS Workshop



### Activity 1.4: Regional Approach to DRR

Regional Brainstorm session

Regional Workshop  
Proposal completed

### Activity 2: Information repository for hazard data

Training Workshop Flood

Training Workshop Drought

Country Missions

National Proposals

1st Exec Committee

2nd Exec Committee

Wrap-up meeting



# Training workshops on Multi-Hazard Early Warning Systems (2009-2010)

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**Focus:** Planning, legislation and Institutional cooperation and coordination at national to local levels

**Target Audience:** Directors of Disaster Risk Management agencies and National Metrological and Hydrological Services, Media, other relevant ministries

**Programme:**

- Training on a number of good practices, lessons learnt, and success factors across all good practices
  - Interactive session to assess SEE national capacities, gaps, priorities in EWS
  - Identification of opportunities for regional cooperation
  - Outcomes are linked to development project in SEE
-



# Information Package

[http://www.wmo.int/pages/prog/drr/events/Pula/index\\_en.html](http://www.wmo.int/pages/prog/drr/events/Pula/index_en.html)

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- Doc 1 - Agenda
  - Doc 2 – Concept Note
  - Doc 3 – Discussion Topics for the Workshop
  - Doc 4 – Instructions for the Trainers
  - Doc 5 – Instructions for Participants and Working Groups
  - Doc 6 – Key questions for discussion during the Working Groups and working group list
  - Background papers on good practices in EWS
  - Participants' list
-



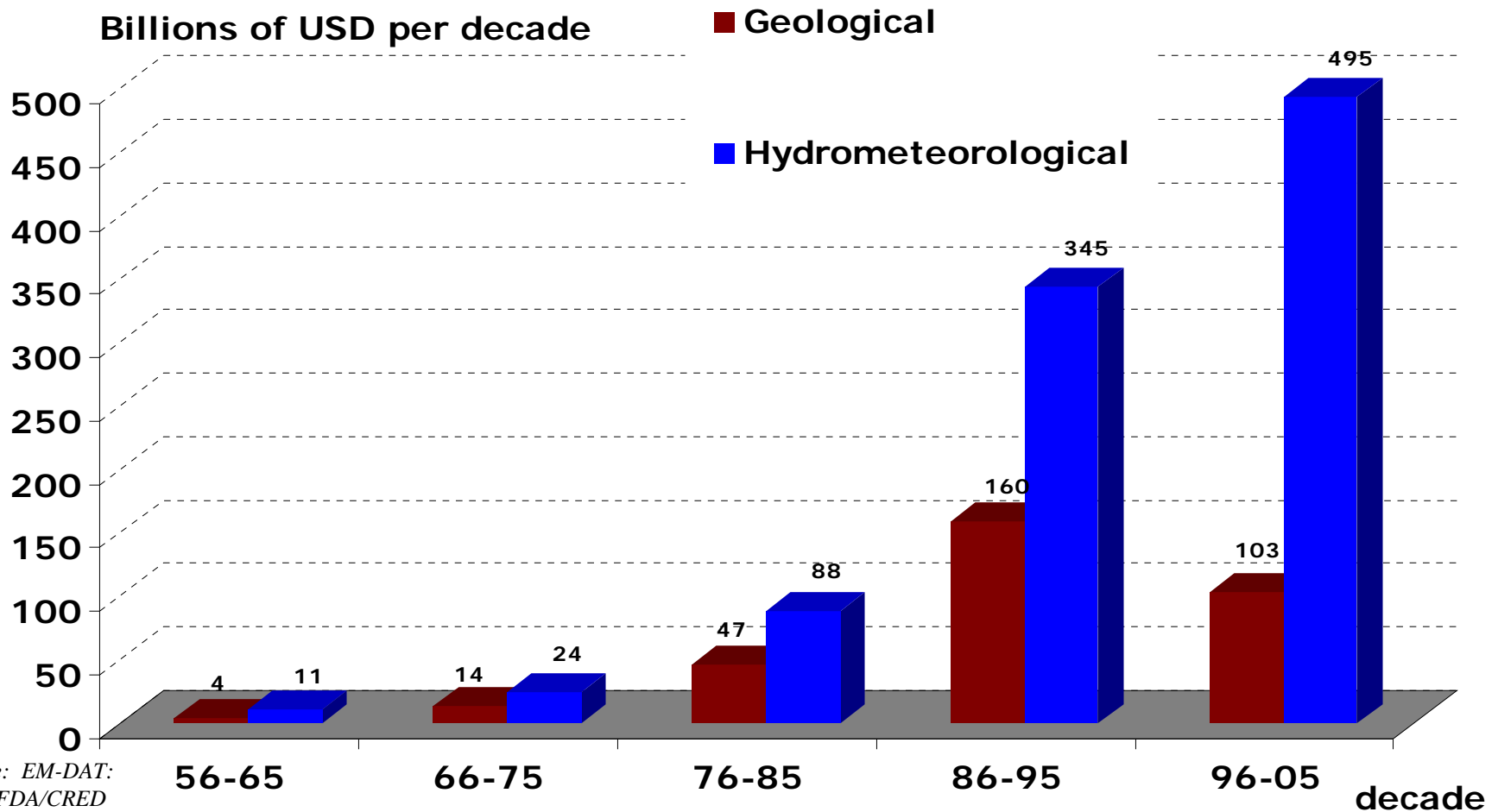
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## 2. What is an Early Warning System with Multi-Hazard Approach





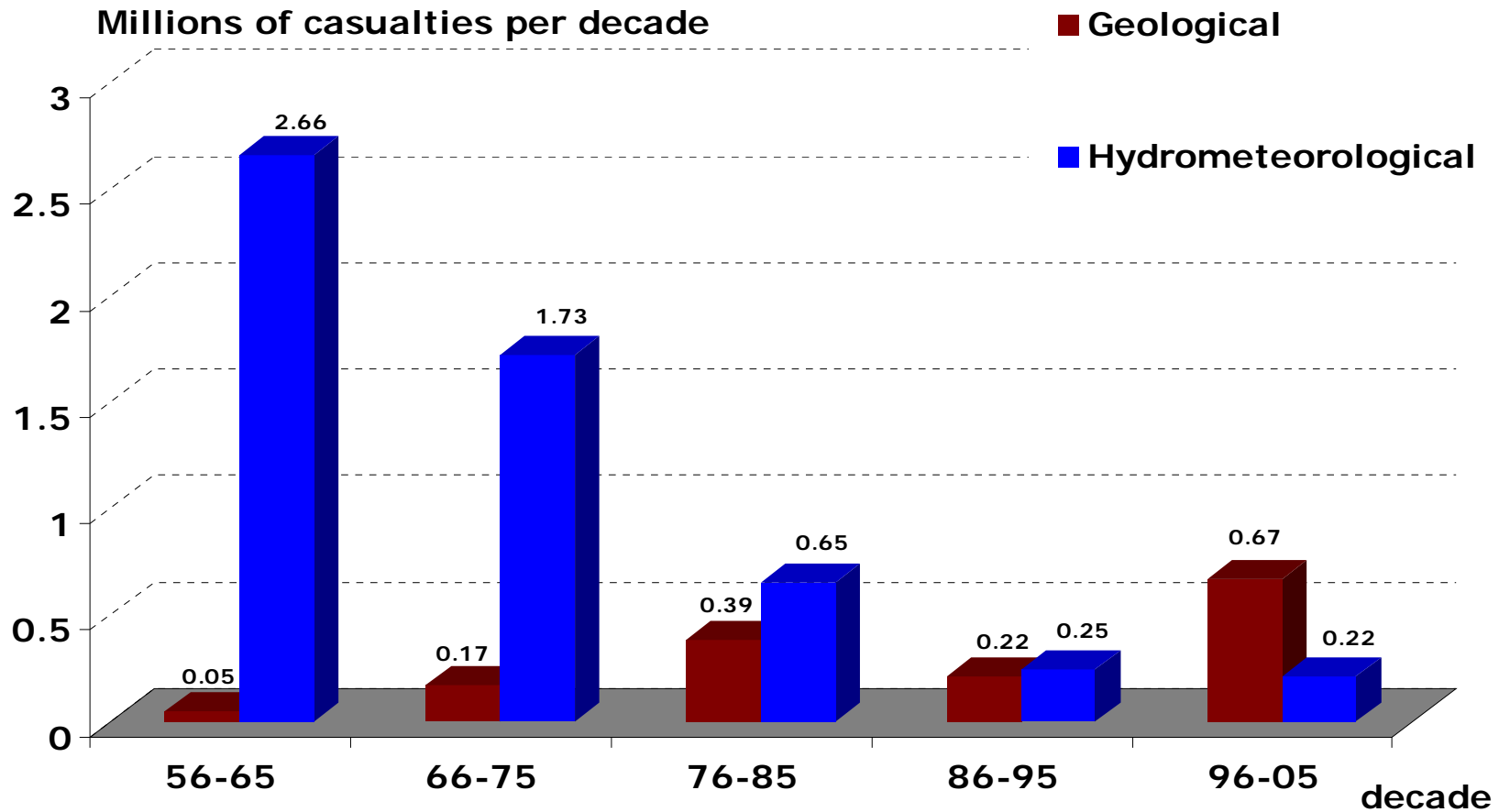
# Economic Losses Related to Disasters are on the Way Up !



Source: EM-DAT:  
The OFDA/CRED  
International Disaster  
Database - [www.em-dat.net](http://www.em-dat.net) - Université  
Catholique de Louvain  
- Brussels - Belgium



# While Casualties related to Hydro-Meteorological Hazards are Decreasing!



Source: EM-DAT:  
The OFDA/CRED  
International Disaster  
Database - [www.em-dat.net](http://www.em-dat.net) - Université  
Catholique de Louvain  
- Brussels - Belgium



# In many countries, early warning systems are not an integral part of disaster risk management

Communities unprepared



## Reactive: Post disaster response



### NATIONAL SERVICES

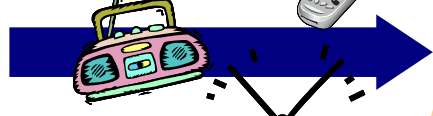
Meteorological

Hydrological

Geological

Marine

Health (etc.)...





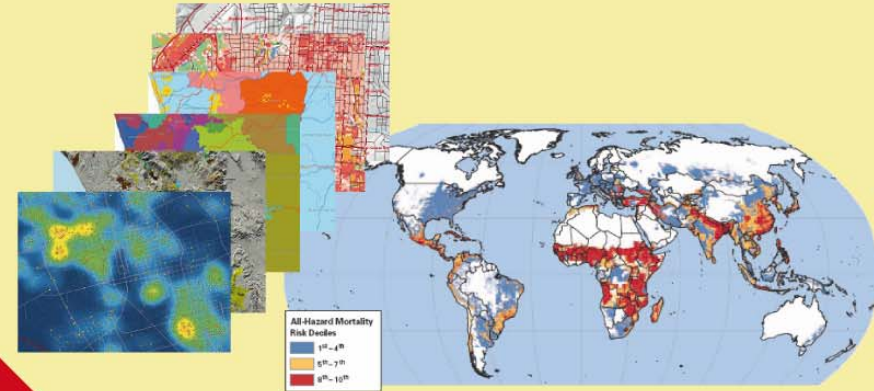


# Effective Early Warning Systems

National to local disaster risk reduction plans, legislation and coordination mechanisms



**Hazard Data and Forecasts**



**Risk Information**

**Coordination  
and  
Collaborations**



**Communication and  
Dissemination Mechanisms**



**Preparedness and  
Early Response**



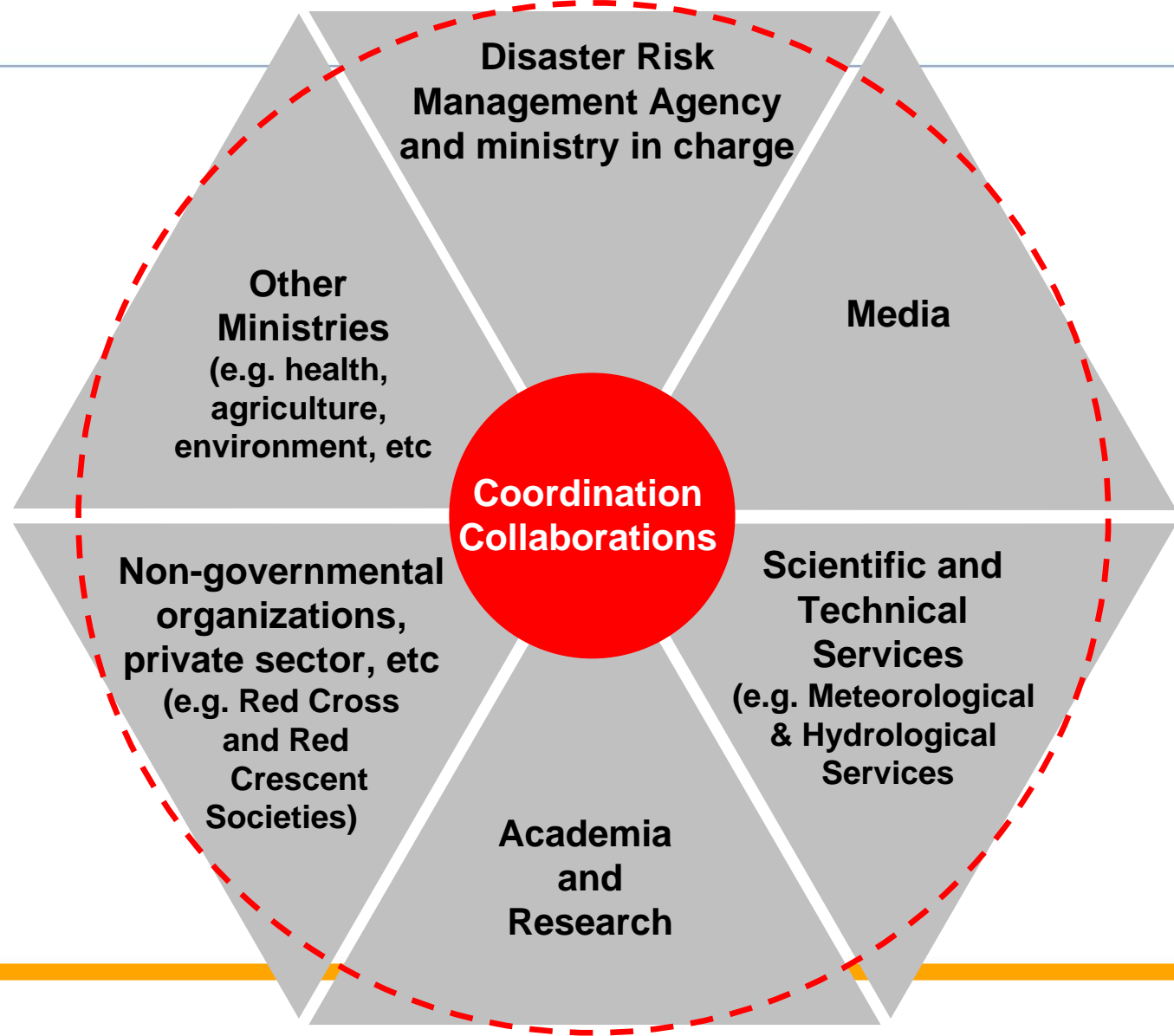


# Criteria for good practices in early warning systems...





# Effective Early Warning Systems Require **Coordination** and **Collaboration** among Various Stakeholders at National to Local Levels





# What is an Effective Early Warning System?

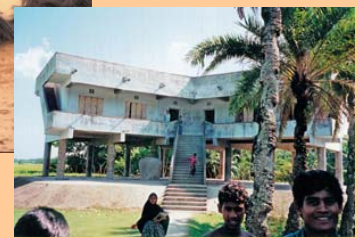


## 4 Community Preparedness



## 2 COORDINATION AMONG NATIONAL SERVICES

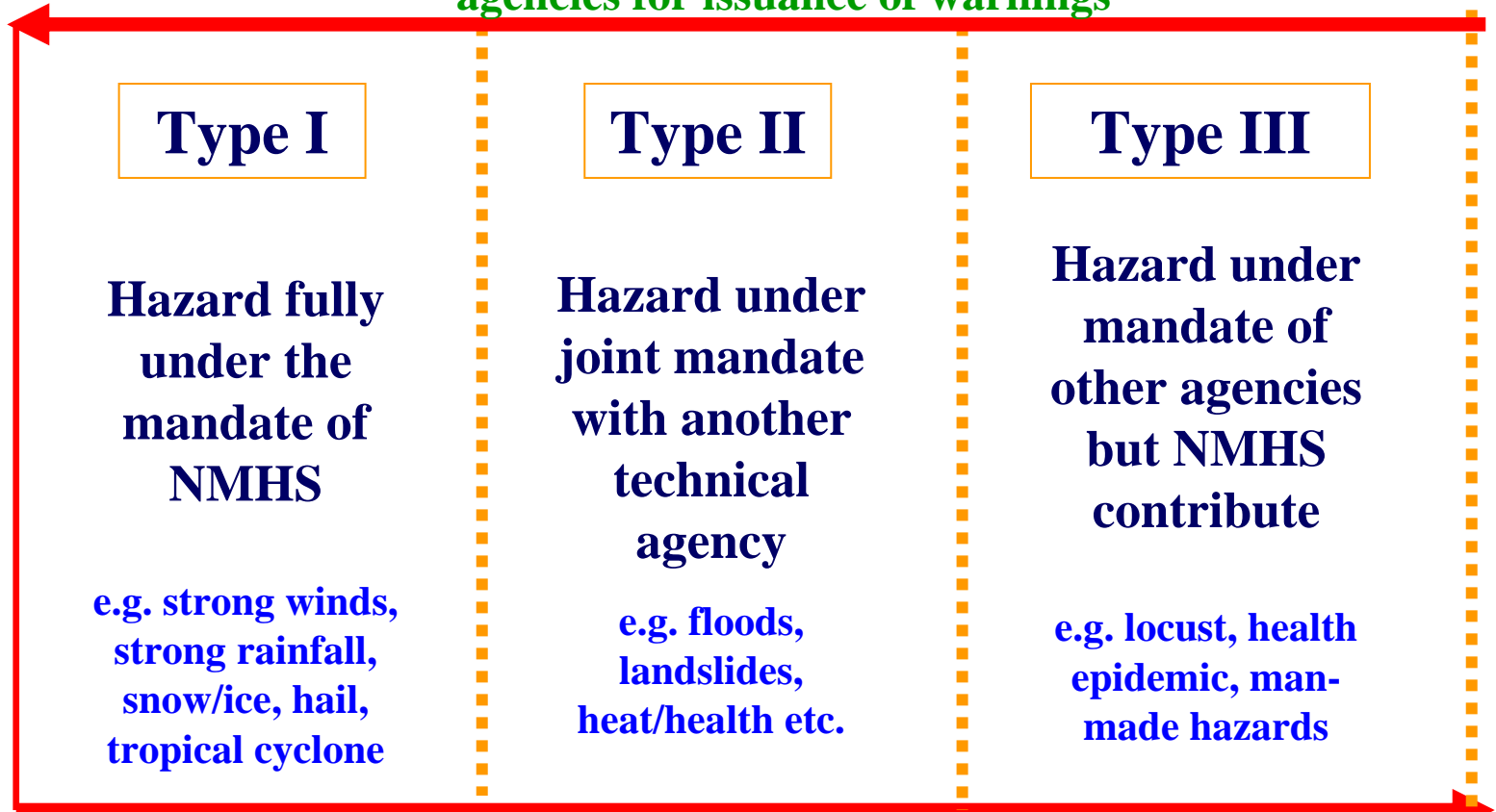
- Meteorological
- Hydrological
- Geological
- Marine
- Health (etc.)





# Coordination and Cooperation with National Hydro-Met Services

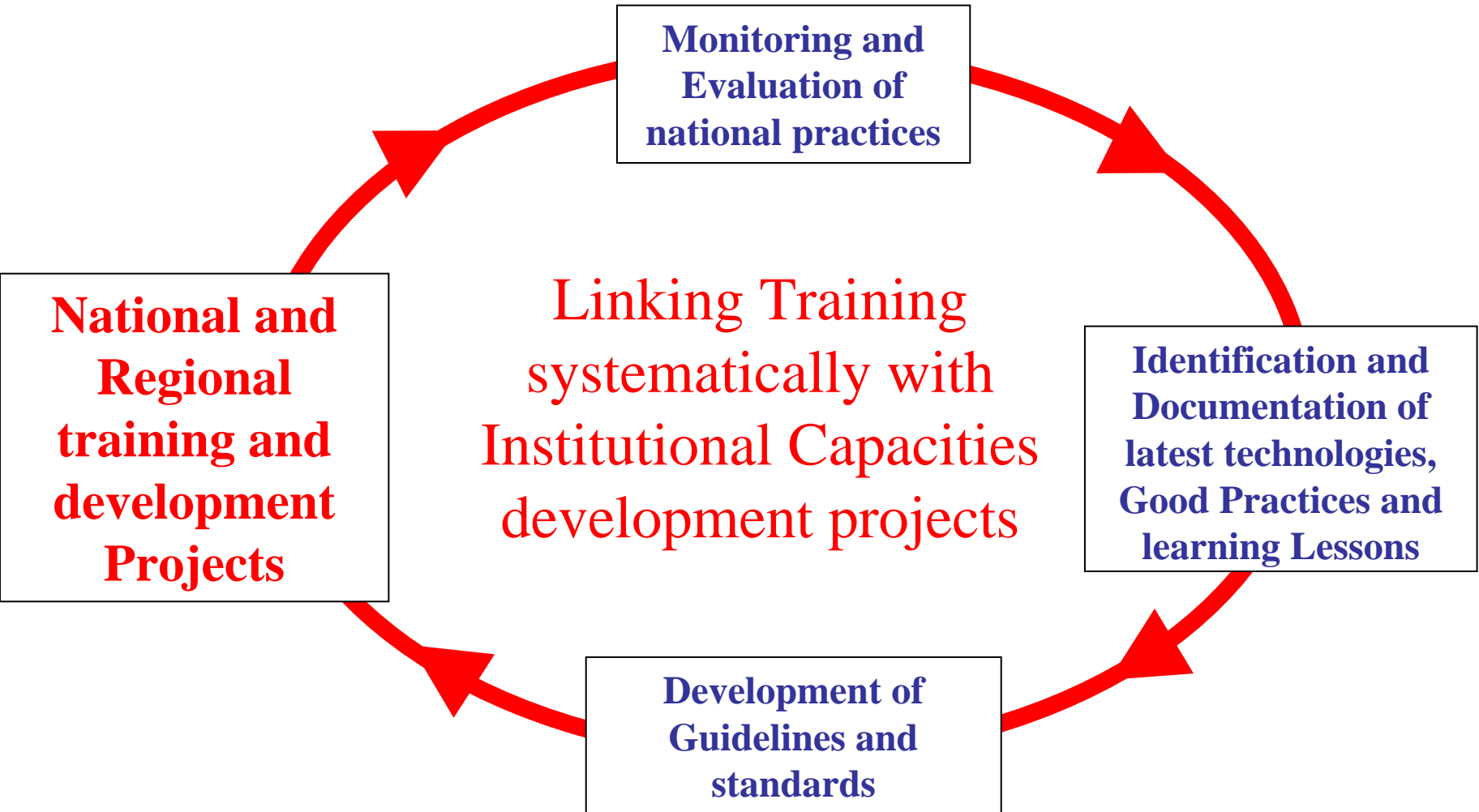
Increasing Level of coordination with civil protection and risk management agencies for issuance of warnings



Increasing Level of coordination with technical agencies for early detection, monitoring and development of warnings



# Systematically linking know-how to capacity development projects





# Systematic documentation of good practices in Multi-Hazard Early Warning Systems

- Good practices in Multi-Hazard EWS documented per criteria
  - Cuba, France, China/Shanghai, Bangladesh documented
  - Documentation of 7 other countries: USA, Italy, Germany, Japan, UK, South Africa, Croatia
- Guidelines on “Capacity Development in Multi-Hazard EWS with focus on Institutional Coordination” developed
  - Target audience: governments and directors of national institutions
- Training package being published (Springer Verlag 2010)

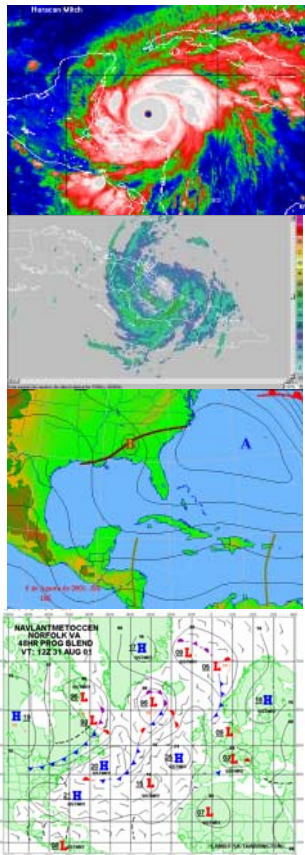




# Example 1: Cuba Cyclone Early Warning

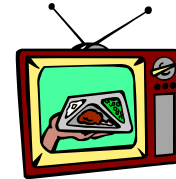
**Small country, 99% access to media (radio & TV), coordinated top-down warning and response mechanisms**

## ANALYSIS AND NUMERICAL MODELS



**Warning**

## DIFUSION OF WARNINGS



TV



RADIO



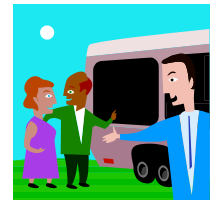
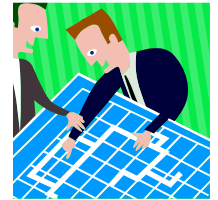
PHONE - FAX



INTERNET

## RESPONSE ACTIONS

GOVERNMENT, CIVIL DEFENSE, RESIDENTS



# Example 2: France Vigilance System



## Hazards



**Strong wind**



**Strong rainfall**



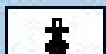
**Thunderstorm**



**Snow/Ice**



**Avalanches**



**Heat waves**

## Level of warning



**Level 4**



**Level 3**

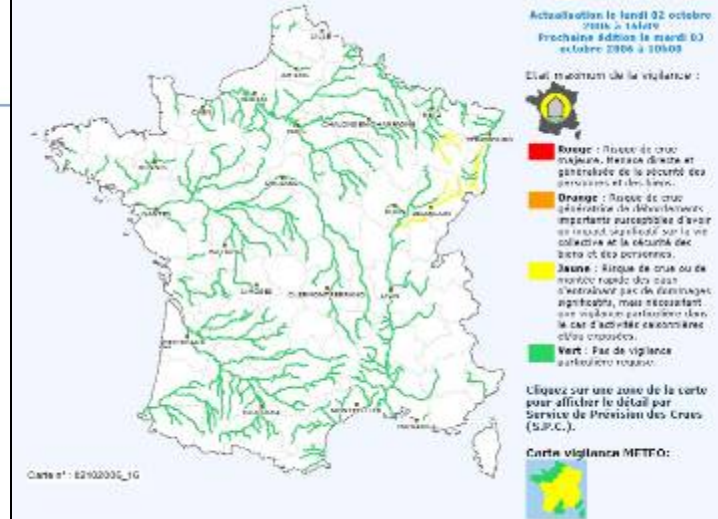


**Level 2**



**Level 1**

## + NEW: Flood warning map



## METEO FRANCE

### Guide vigilance

Carte de vigilance météorologique  
Diffusée le mercredi 03 décembre 2003 à 10h32  
Valable jusqu'au jeudi 04 décembre 2003 à 06h00

Actualisation de la carte diffusée  
le 03 décembre 2003 à 08h25

### Commentaires Météo-France

Sur la région de Montpellier la situation est potentiellement catastrophique aujourd'hui. Le vent d'Est violent souffle en Méditerranée.

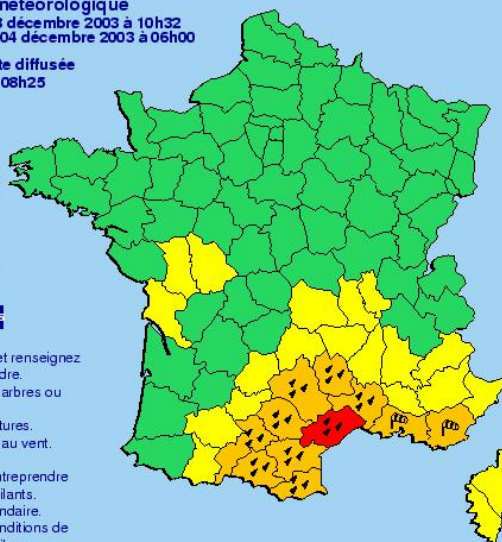
### Conseils des pouvoirs publics

#### Vent/orange

- Limitez vos déplacements et renseignez vous avant de les entreprendre.
- Prenez garde aux chutes d'arbres ou d'objets.
- N'intervenez pas sur les toitures.
- Rangez les objets exposés au vent.

#### Précipitations/orange

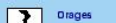
- Renseignez vous avant d'entreprendre un déplacement et soyez vigilants. Evitez le réseau routier secondaire.
- Soyez prudents face aux conditions de circulation pouvant être difficiles.
- Si vous habitez en zone habituellement inondable, prenez les précautions d'usage.



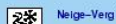
Vent violent



Fortes précipitations



Orages



Neige-Verglas



Avalanches

**Niveau 4** : Une vigilance absolue s'impose; des phénomènes météorologiques dangereux d'intensité exceptionnelle sont prévus; tenez-vous régulièrement au courant de l'évolution météorologique et conformez-vous aux conseils ou consignes émis par les pouvoirs publics.

**Niveau 3** : Soyez très vigilant; des phénomènes météorologiques dangereux sont prévus; tenez-vous au courant de l'évolution météorologique et suivez les conseils émis par les pouvoirs publics.

**Niveau 2** : Soyez attentif si vous pratiquez des activités sensibles au risque météorologique; des phénomènes habituels dans la région mais occasionnellement dangereux (ex mistral, orage d'été) sont en alerte prévue; tenez-vous au courant de l'évolution météorologique.

**Niveau 1** : Pas de vigilance particulière.

Les cartes de vigilance météo paraissent 2 fois par jour à 08h et à 16h.

En cas de vigilance orange (niveau 3) ou rouge (niveau 4), des bulletins de suivi sont disponibles.

**Initiated in coordination by Météo-France and French civil security, Vigilance system activates cascades of preparedness and response plans, actions and responsibilities**

**Legislation**

**Planning**

**Organizational linkages**

**Training and feedback**

**national to local authorities**

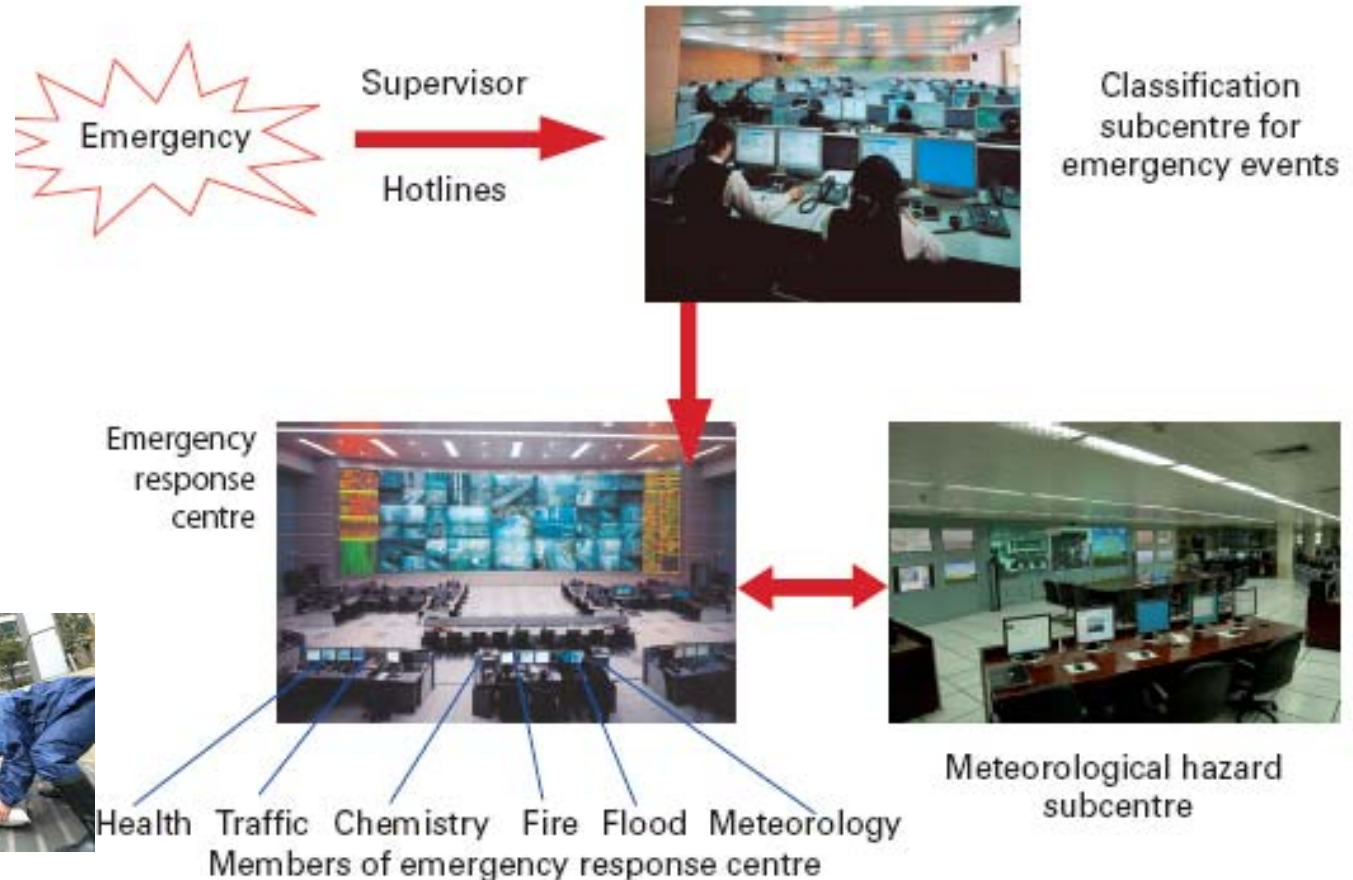




# Example 3: Shanghai City Multi-Hazard Early Warning and Emergency Response Programme (Mega City)

- Governance : (mega) city-level.
- Organisational: Top-down (monitoring, forecasting, warning) and bottom-up
- Operational: Community-based + high tech monitoring and alerting tools

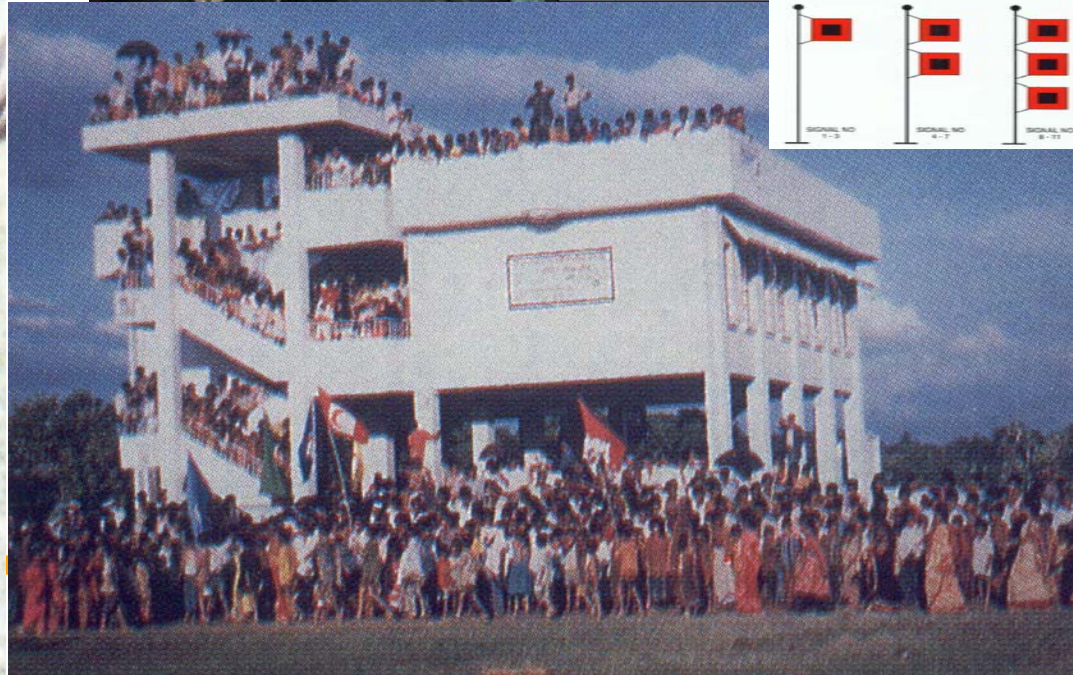
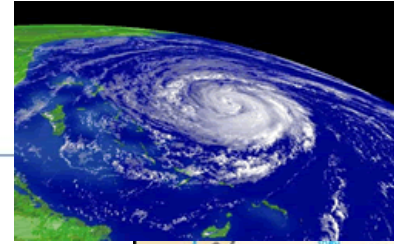
**Multi-Hazard Approach: Services are specialized but shared for alert dissemination and response mechanisms.**





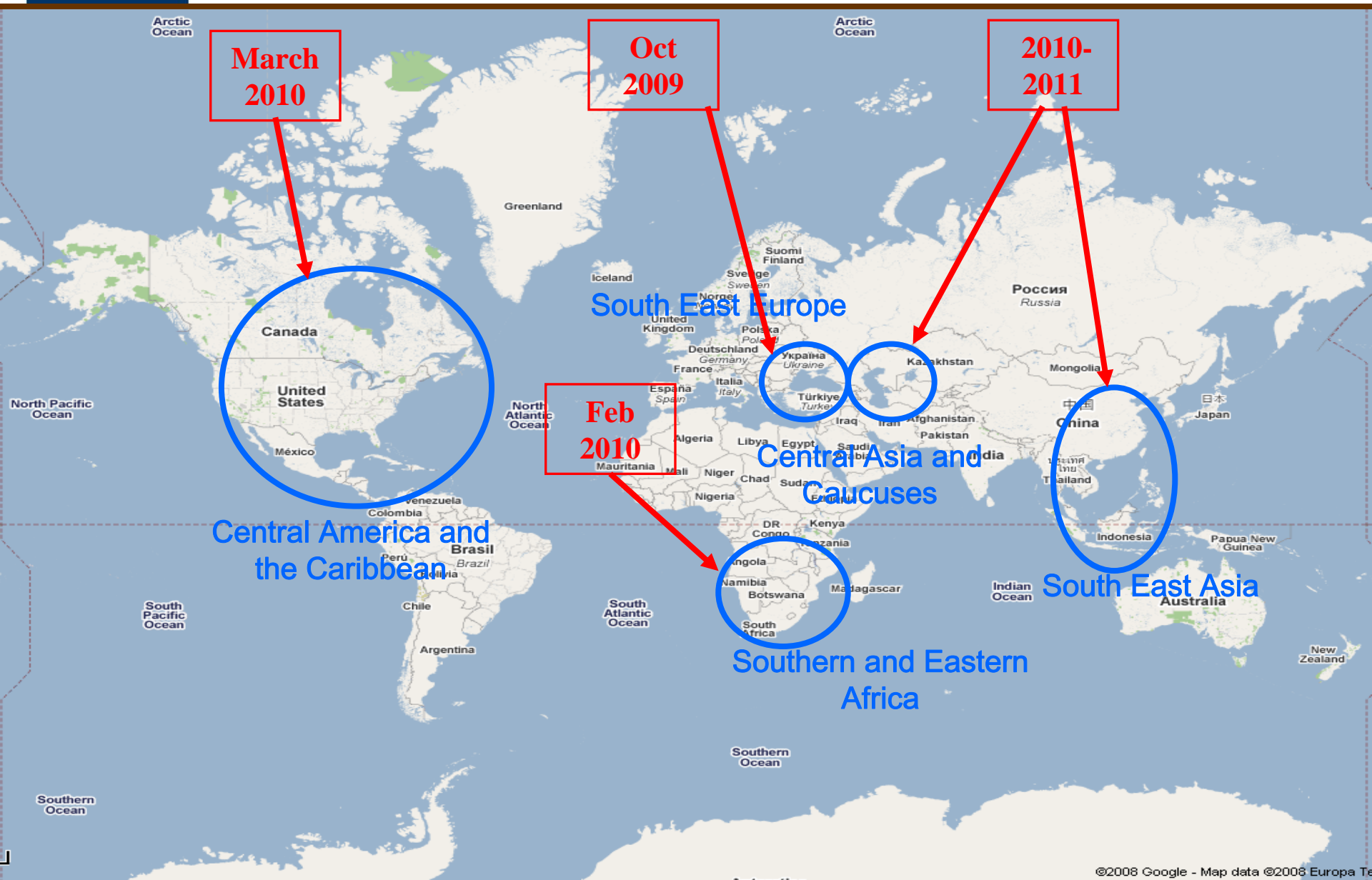


# Example 4: Cyclone Preparedness Programme in Bangladesh





# Training workshops on Multi-Hazard Early Warning Systems (2009-2010)



March 2010

Oct 2009

2010-2011

South East Europe

Central Asia and Caucasus

Central America and the Caribbean

Southern and Eastern Africa

South East Asia



# Introduction of Trainers

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- Dr. Jose Rubiera (Cuba)
  - Dr. Cyril Honore (France)
  - Dr. Patrizio Emiliani and Col. Sergio Pasquini (Italy)
  - Dr. Yinming Yang (China)
  - Mr. Lynn Maximuk (USA)
-



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### **3. Ten Basic principles for effective Early Warning System with Multi-Hazard Approach**

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# 10 Basic principles for effective Early Warning Systems

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1. Political recognition of the benefits of EWS along with effective legislation and planning
  2. Capacities and resources aligned and effective collaboration and coordination mechanism in place
  3. key stakeholders are indentified and their roles and responsibilities clearly defined and documented
  4. National Hydro-Met agencies capacities, roles and responsibilities reflected in policies, plans, legislation
  5. Clear, consistent and actionable warnings, with risk information, issued by a single recognized authoritative source
-



## 10 Basic principles for effective Early Warning System (Continued)

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6. Timely, reliable, redundant and sustainable warnings disseminated to authorities and public at risk
  7. Emergency response plans targeted to the individual needs of the vulnerable communities, authorities and emergency responders
  8. Standard Operational Procedures, linking warning to clear emergency preparedness and response actions
  9. Regular training and education programmes in risk awareness and emergency response and warnings
  10. Effective feedback mechanisms for system improvement over time
-



# *Thank You*

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**For more information please contact:**

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**<http://www.wmo.int/disasters>**

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