

Outline of the talk

- Early Warning in our society and science nexus
- Conceptualizing “Early Warning System (EWS)” in the context of Disasters
- Key Components of people-centric EWS

1.

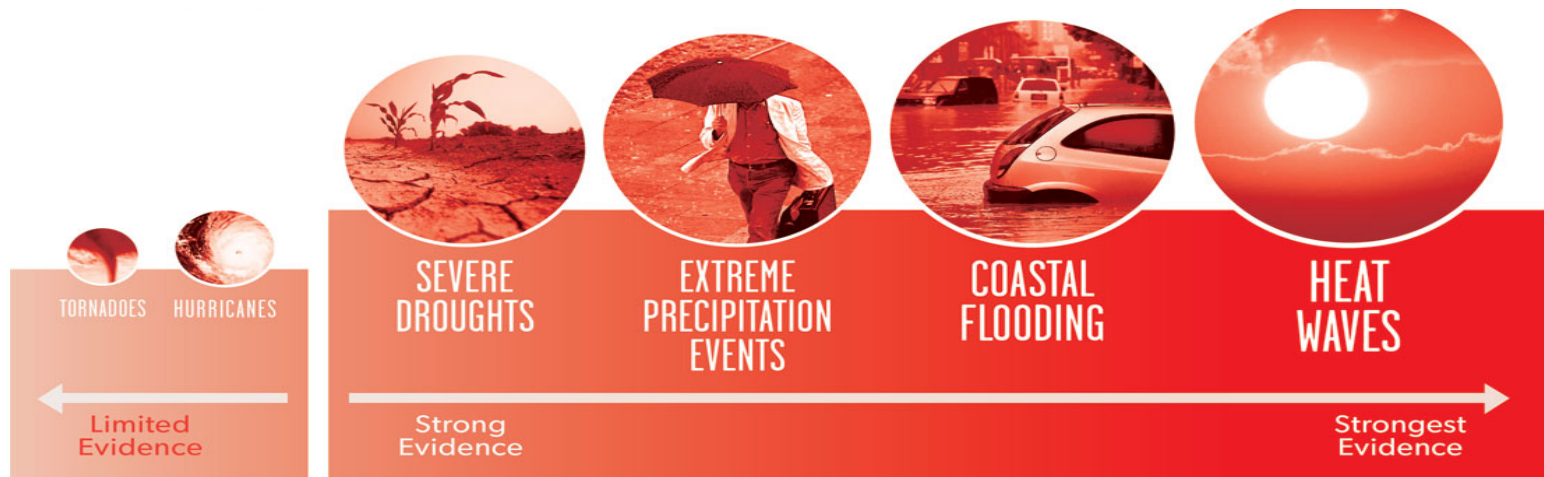
**Early Warning in our society
and science nexus**



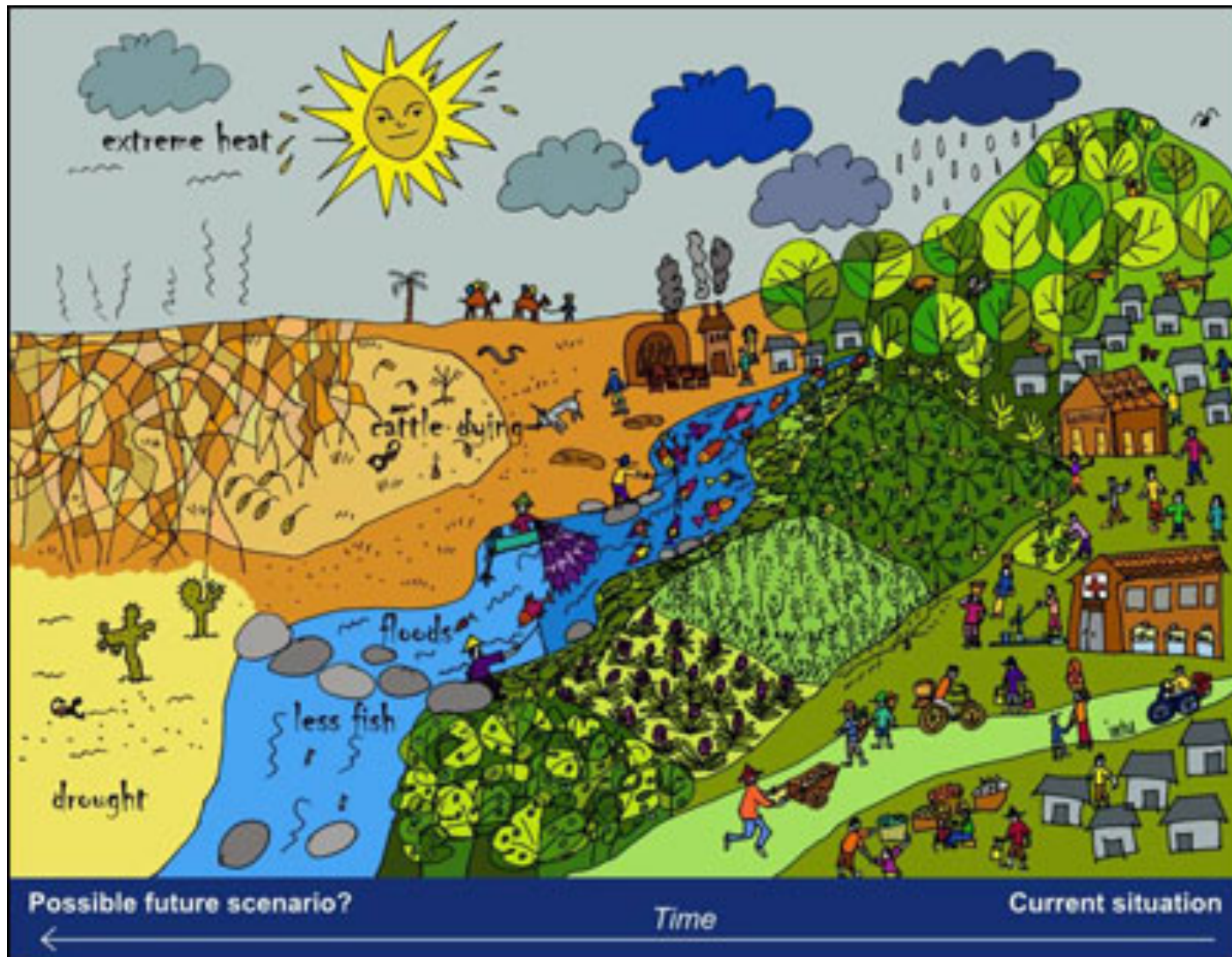
**Observing nature
and hinting future
is an ancient
affair.....**



We are living in a changing time
where looking into the future is critical than ever.....

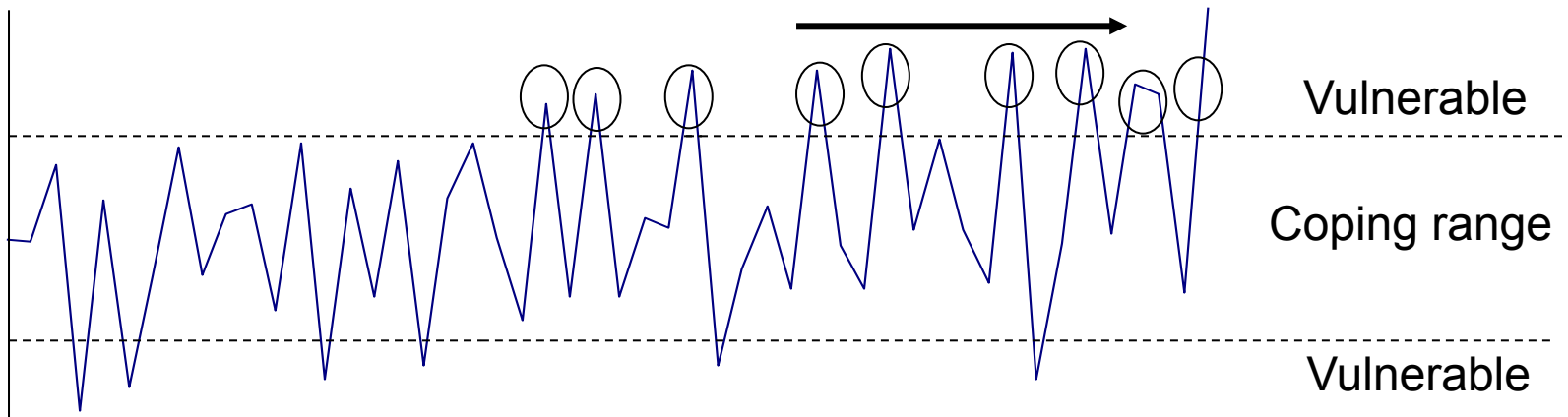


Societies are also good at expressing changes in a metaphoric manner, comparing future with their current times!

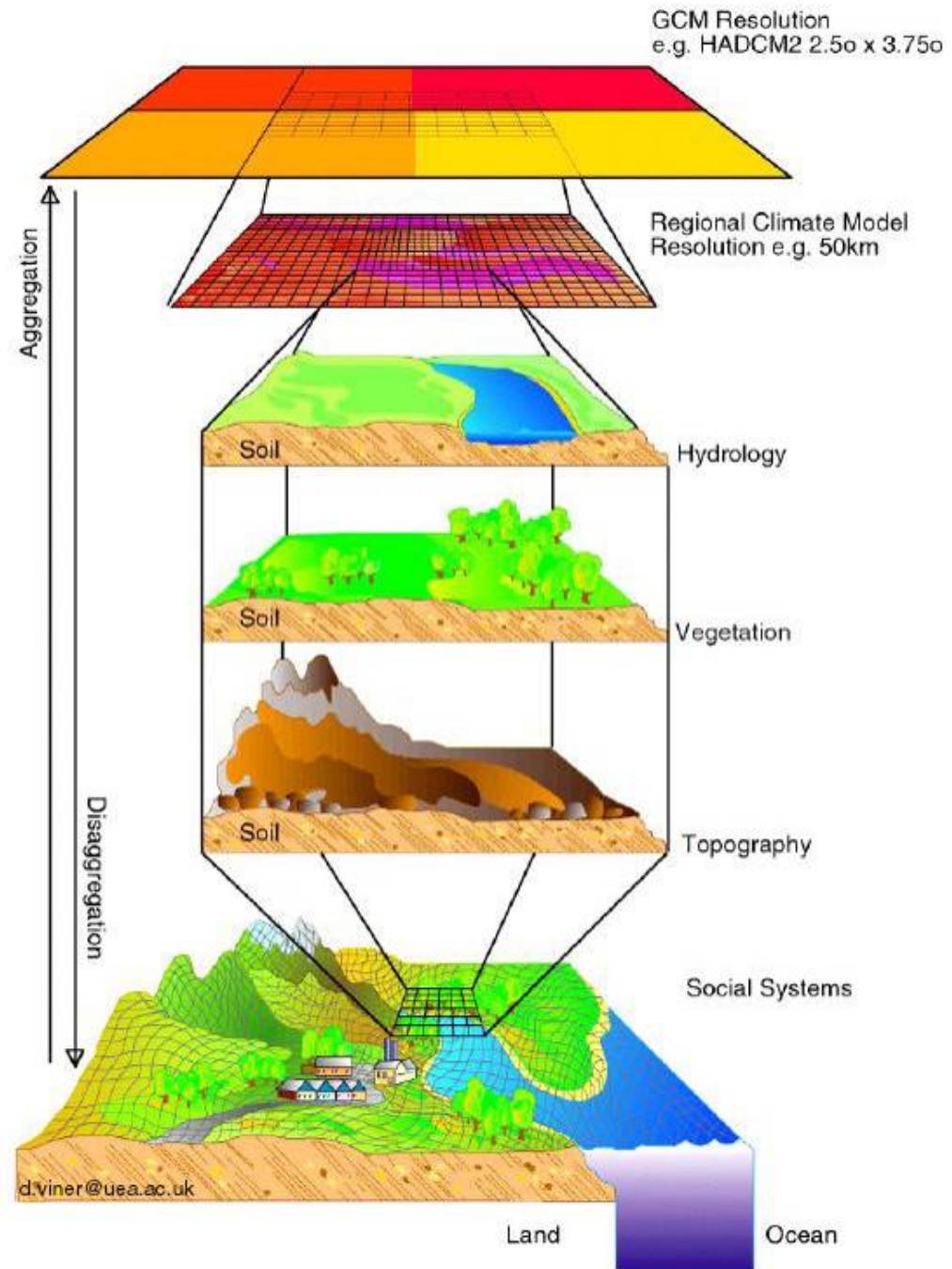


But, the problem is.....

Hazards are going beyond past experiences

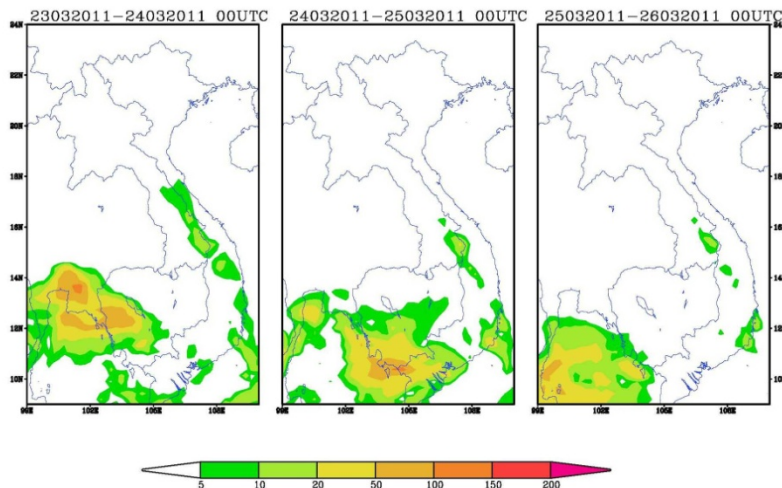


A science based process is needed for early warning

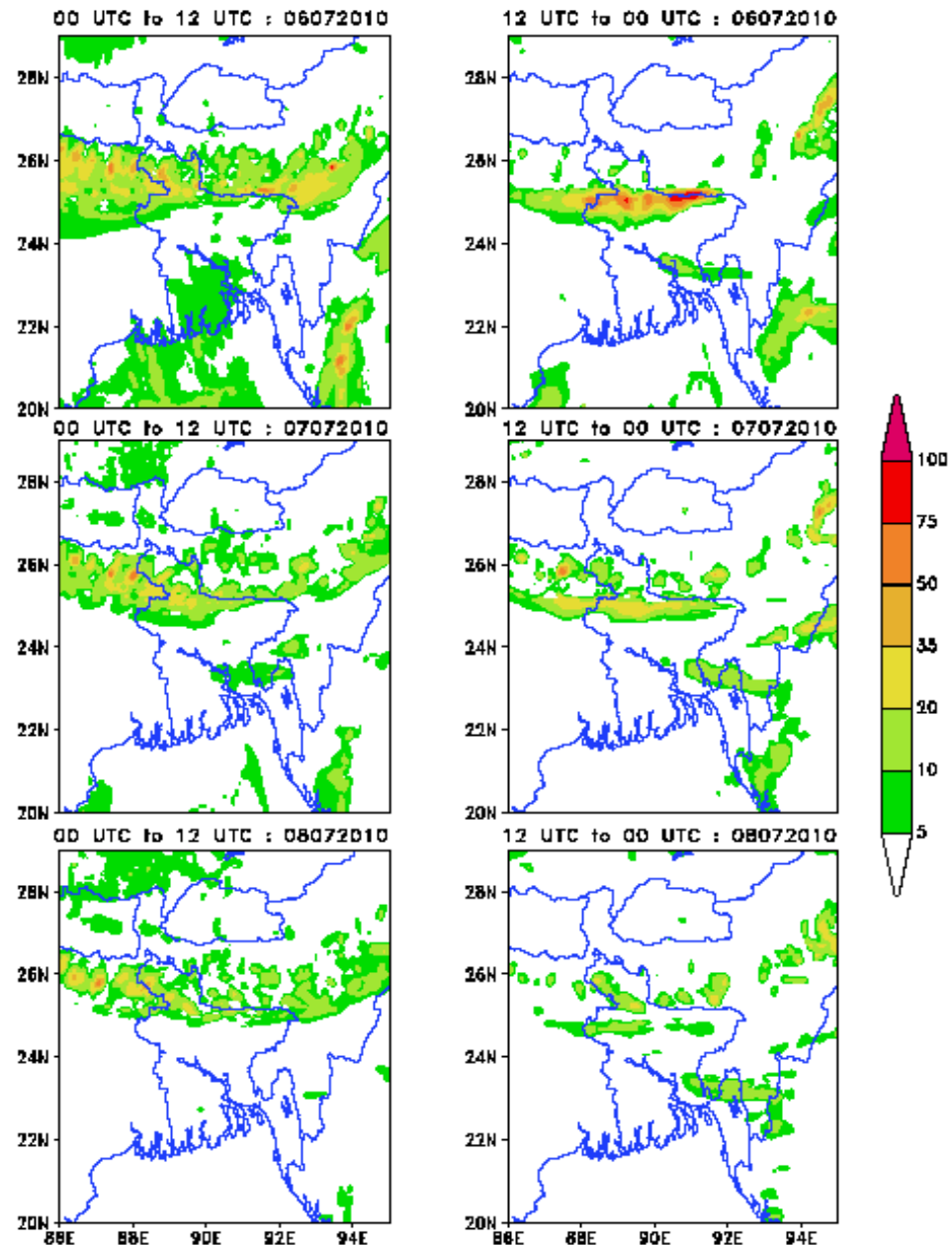


More localized and long-lead predictions

24 Hour Accumulated Rainfall (mm) Valid from



12 Hour Accumulated Rainfall (mm) Forecast Valid Between



2.

Conceptualizing EWS in the
context of Disasters

Defining Early Warning System (EWS)?

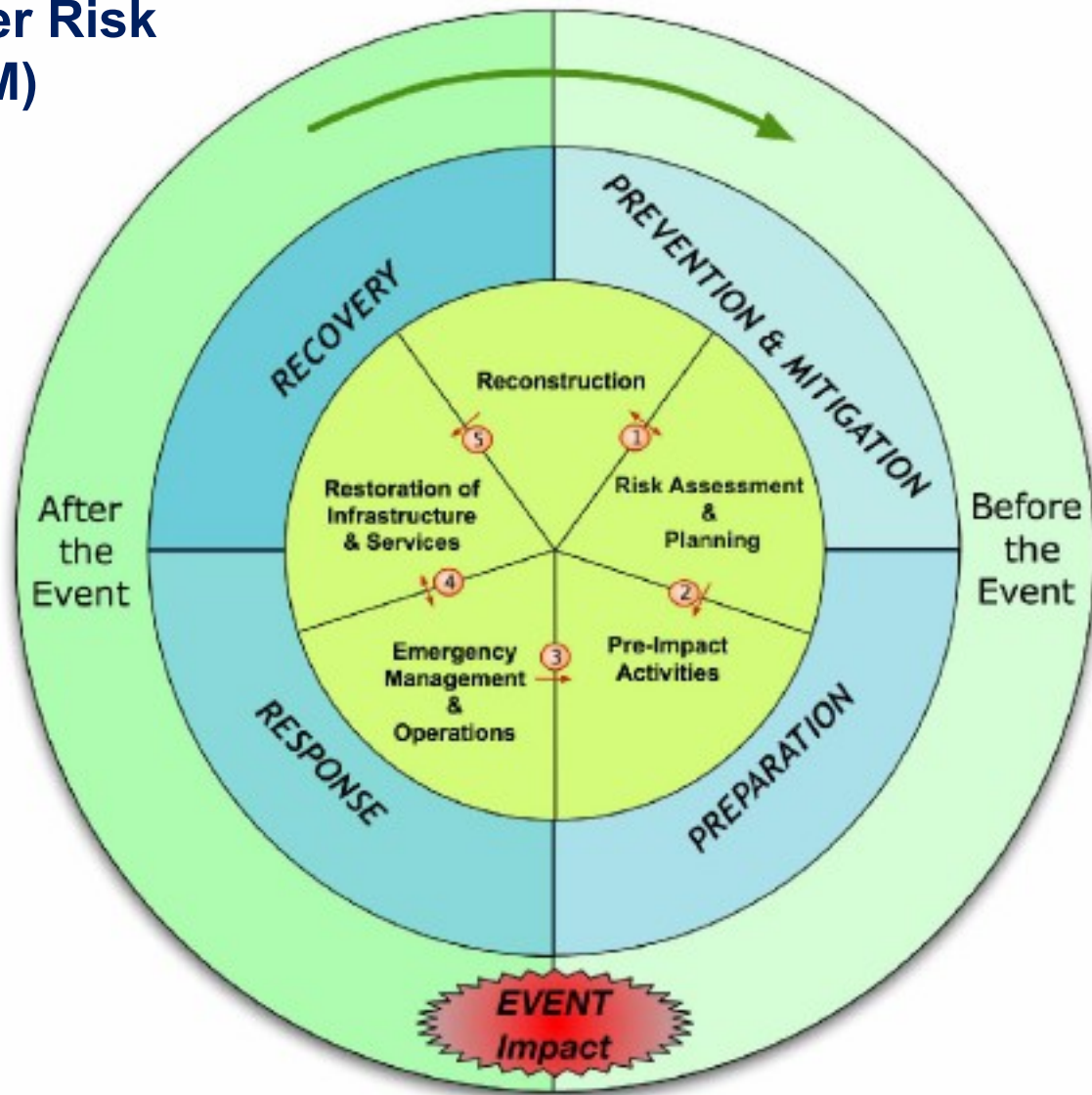
“EWS is the set of capacities needed to generate and disseminate
timely and meaningful warning information

to enable individuals, communities and organizations threatened
by hazards

to take necessary preparedness measures and act appropriately
in sufficient time to reduce the possibility of harms or losses ”

(ISDR: 2006)

EWS is an essential element of Disaster Risk Management (DRM)



(Atkinson et al, 2006)

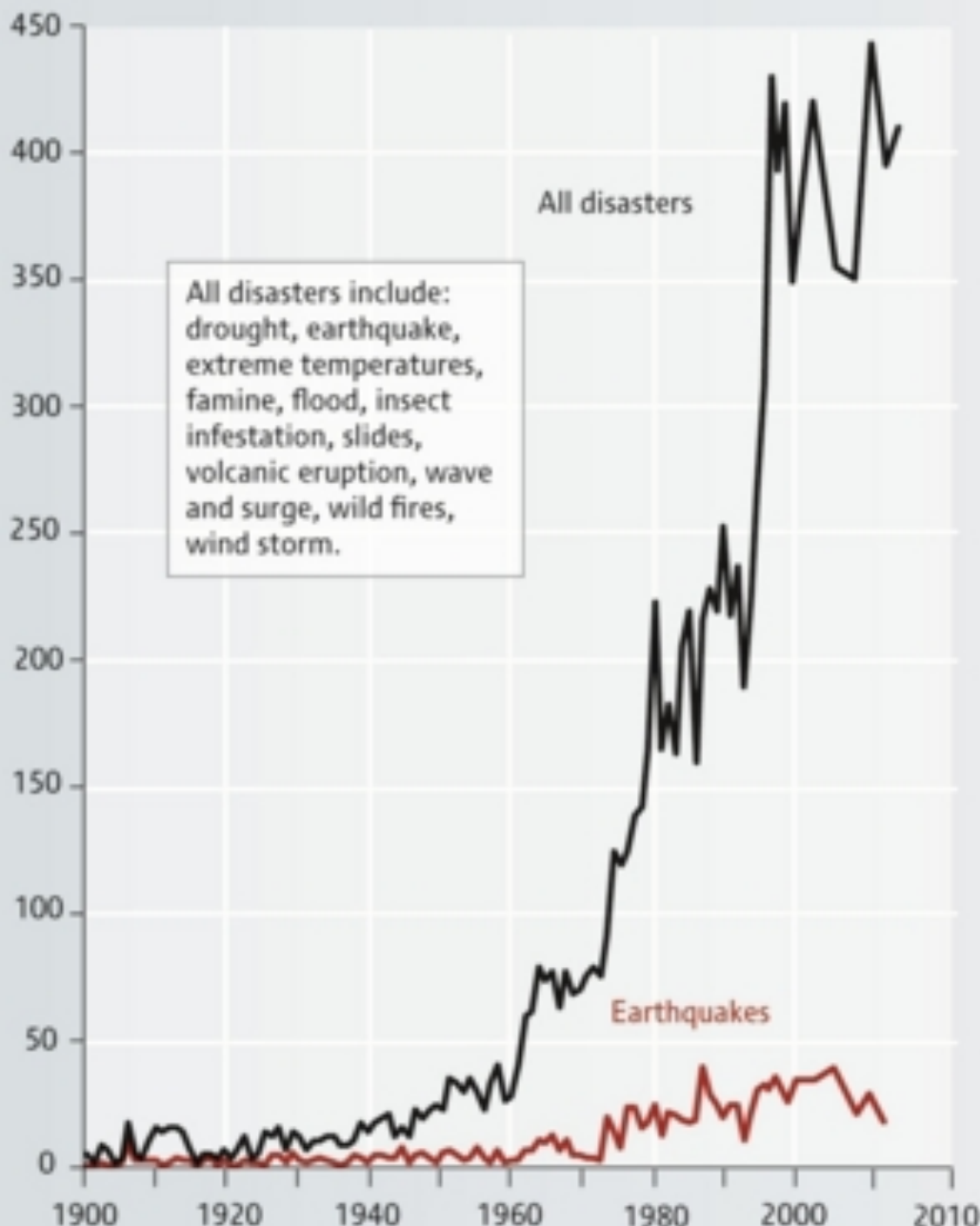
Governance and institutional framework (national to local levels)

Risk assessment	Risk reduction	Risk transfer
<ul style="list-style-type: none">Hazard databasesHazard statisticsClimate forecasting and trend analysisExposed assets and vulnerabilityRisk analysis tools	<ul style="list-style-type: none">PREPAREDNESS: Early warning systems Emergency planningMITIGATION AND PREVENTION: Medium to long term sectoral planning	<ul style="list-style-type: none">Catastrophe insurance and bondsWeather-indexed insurance and derivativesOther emerging products

Information and knowledge sharing
Education and training

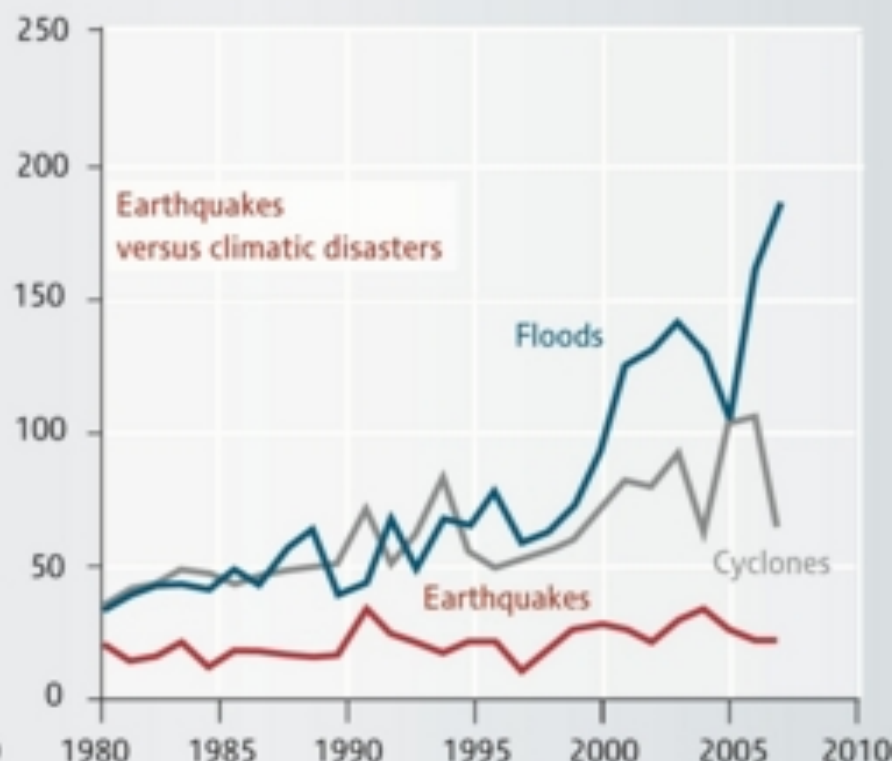
Number of disasters

per year

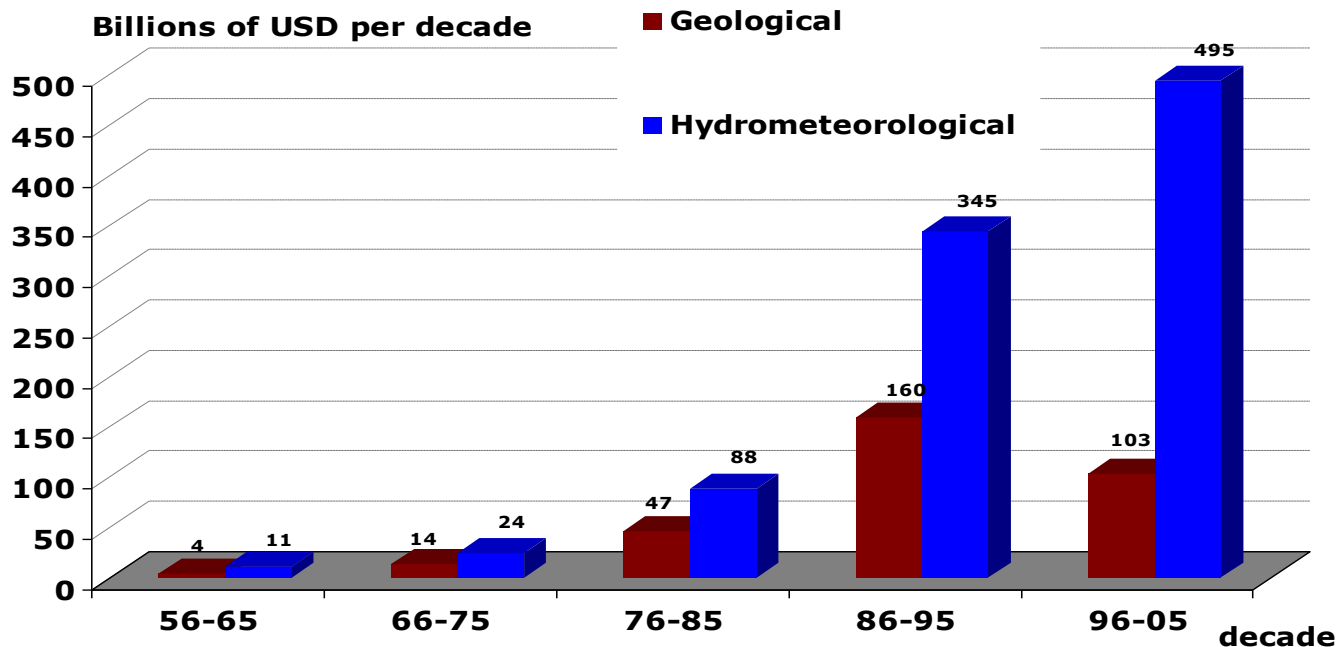


Trends in number of reported disasters

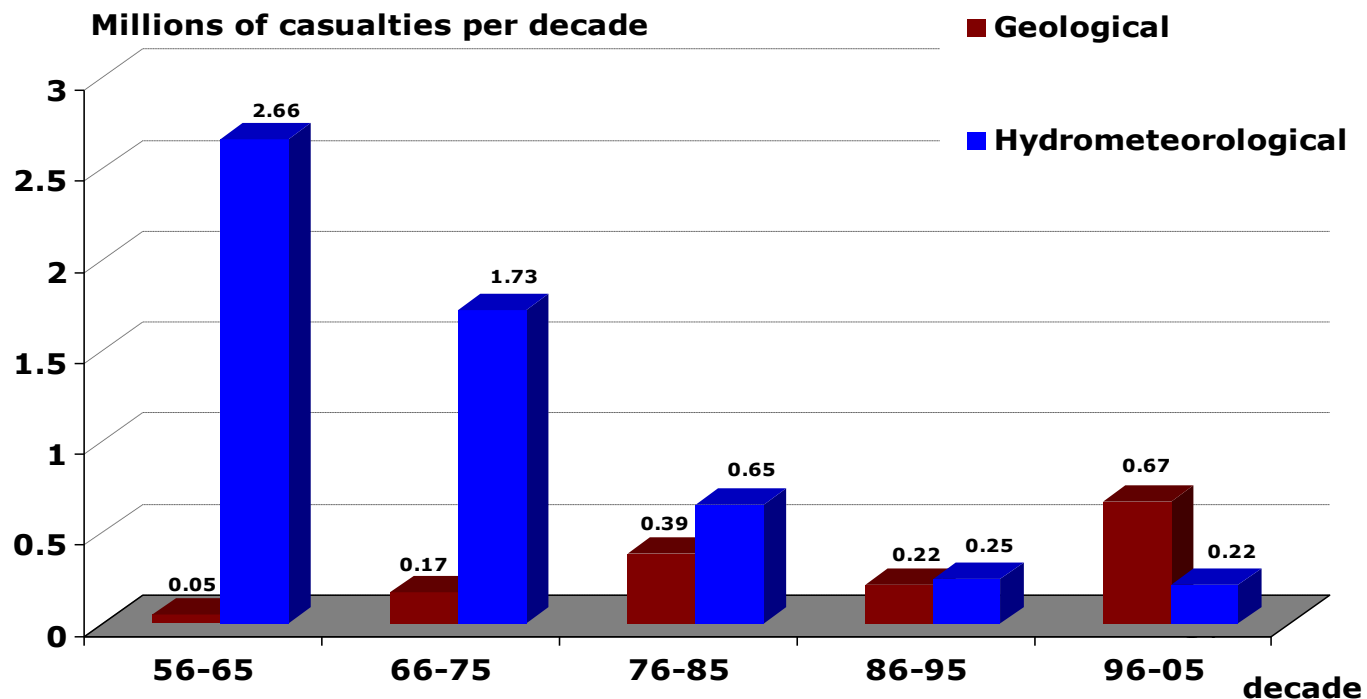
Much of the increase in the number of hazardous events reported is probably due to significant improvements in information access and also to population growth, but the number of floods and cyclones reported is still rising compared to earthquakes. Is global warming affecting the frequency of natural hazards?



Economic losses related to disasters are increasing



But, EWSs are saving lives

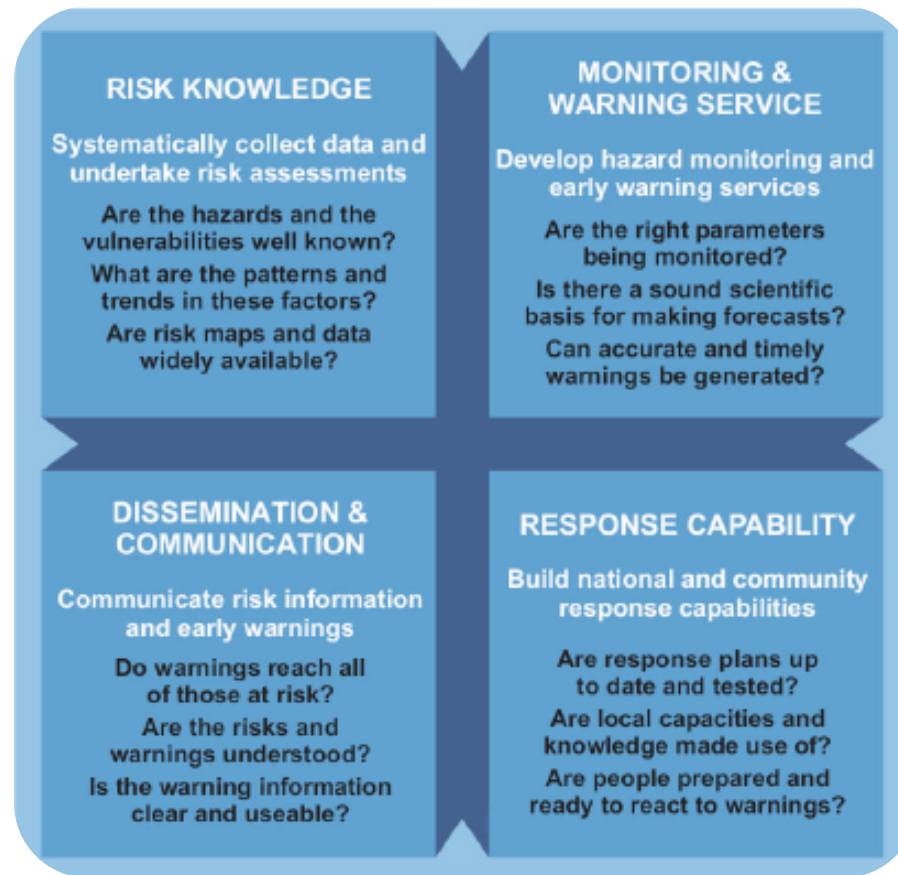


Source: EM-DAT: The OFDA/CRED International Disaster Database

3.

Key components of people-centric
EWS

Key Components of a people- centered EWS



(ISDR: 2006)

RISK KNOWLEDGE

Systematically collect data and undertake risk assessments

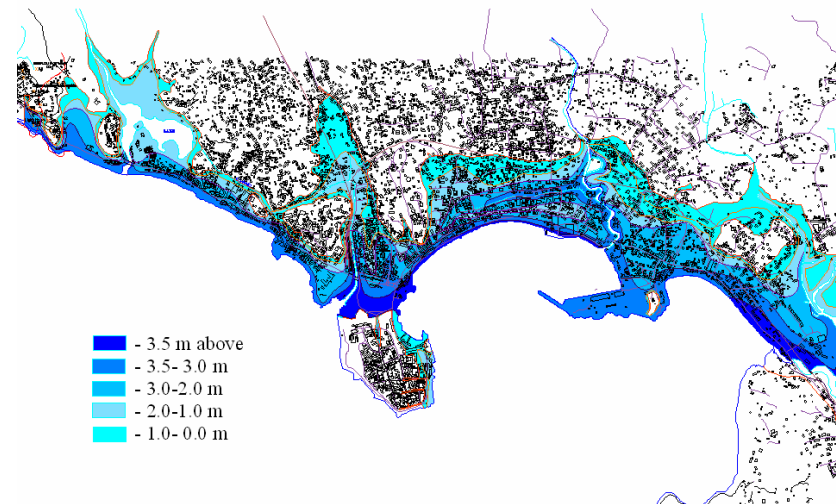
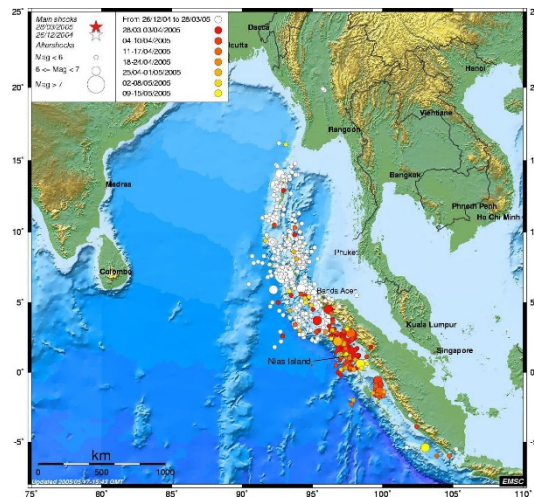
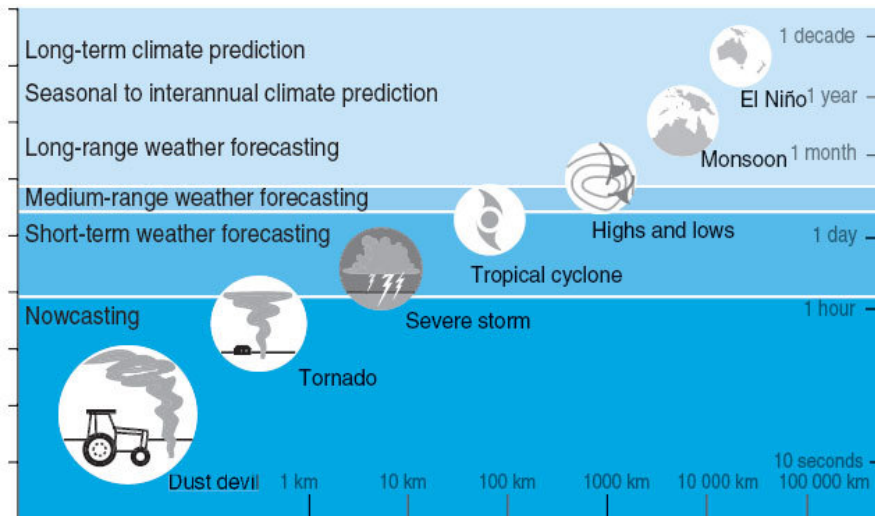
Are the hazards and the vulnerabilities well known?

What are the patterns and trends in these factors?

Are risk maps and data widely available?

Knowledge on:

- Hazards
- Sources
- Trends
- Spatial distributions
- Temporal distributions



MONITORING & WARNING SERVICE

Develop hazard monitoring and early warning services

Are the right parameters being monitored?

Is there a sound scientific basis for making forecasts?

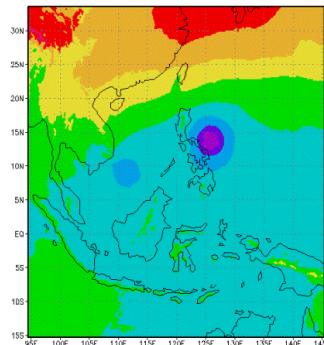
Can accurate and timely warnings be generated?

Ability to:

- Detect
- Predict
- Observe
- Formulate warning

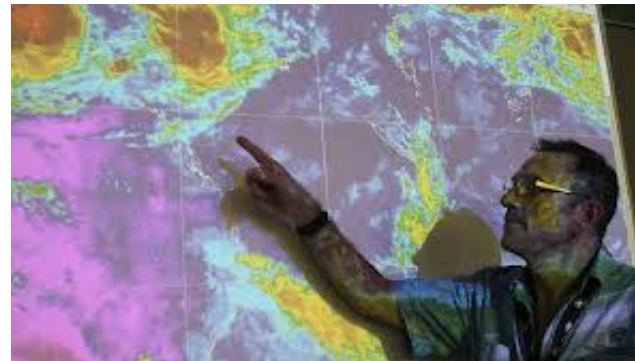


fcst. Mean Sea level Pressure 23110700+36 hrs.



SHES: COLA/DES

2007-11-28-18:09



DISSEMINATION & COMMUNICATION

Communicate risk information and early warnings

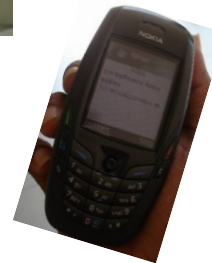
Do warnings reach all of those at risk?

Are the risks and warnings understood?

Is the warning information clear and useable?

Various layers of redundant dissemination and communication systems:

- Siren towers
- EOCs, DMIC
- Last mile public addressing systems
- Temples bells
- Miking
- Many more



RESPONSE CAPABILITY

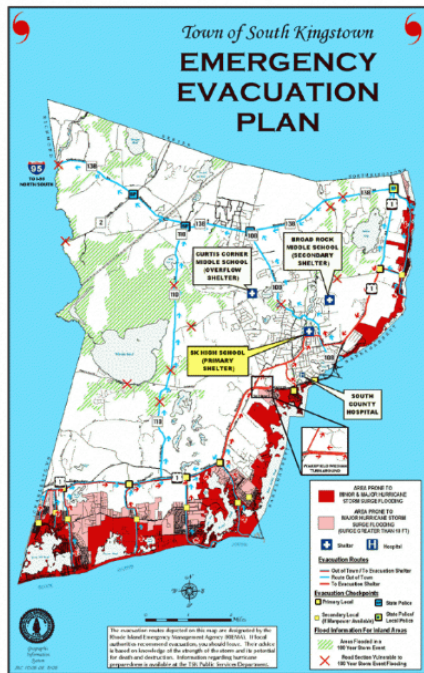
Build national and community response capabilities

Are response plans up to date and tested?

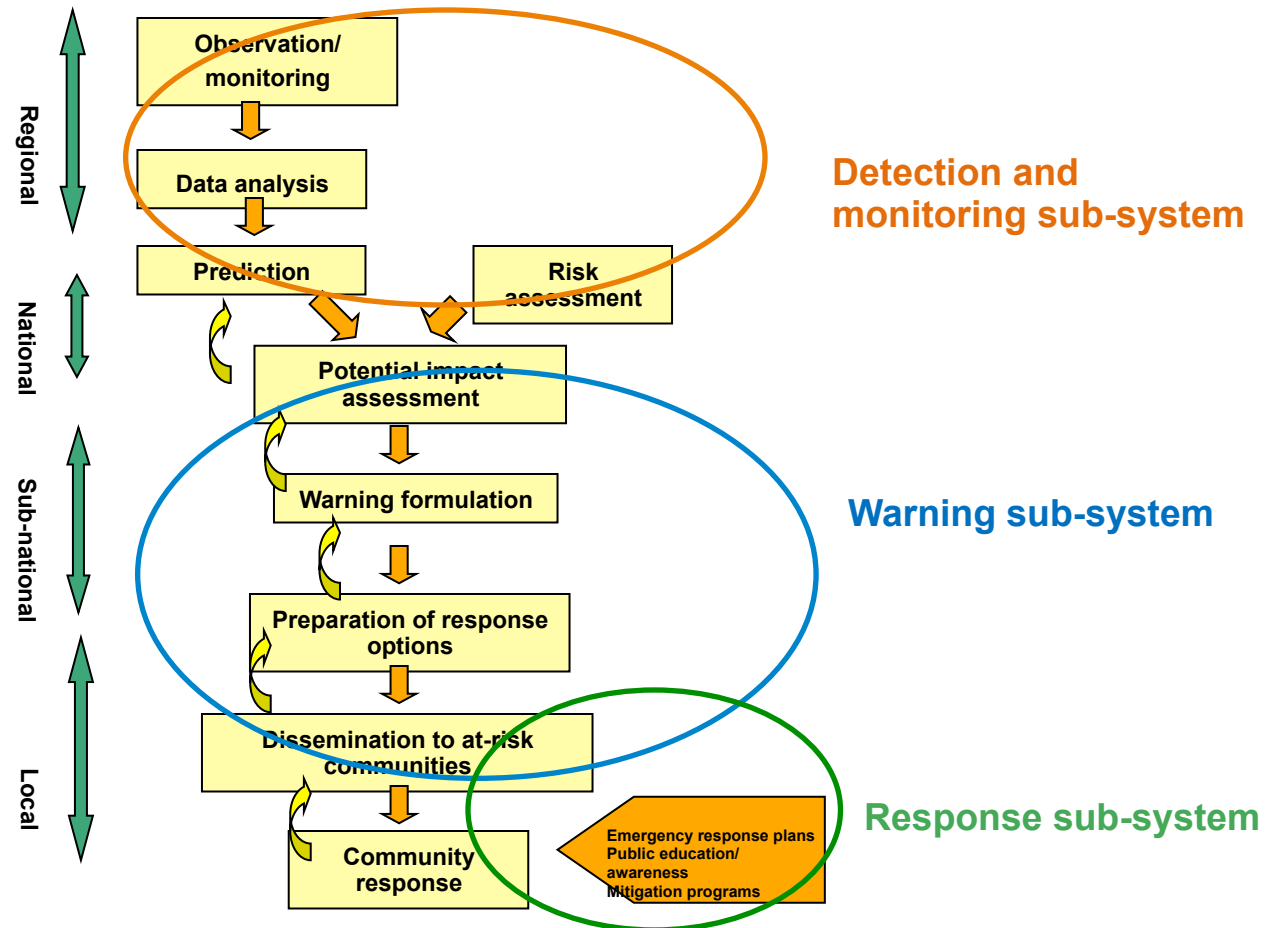
Are local capacities and knowledge made use of?

Are people prepared and ready to react to warnings?

- Plans
- Evacuation sites
- Processes
- Procedures
- Participation



End-to-end early warning system components



Few success key factors for EWS - Technical

- **Predictability** relates to the ability to predict or forecast the impact of a hazard with respect to magnitude, location, and timing;
- **Detect-ability** refers to the ability to confirm the prediction that impacts are going to occur;
- **Certainty** is the level of confidence of predictions and detections;
- **Lead time** is the amount of time between prediction/detection and the impact of the hazard;
- **Duration of impact** is the time between the beginning and ending of impacts in which warning information can be disseminated;
- **Scientific dissemination** networks and institutions

Few success key factors for EWS – Social and institutional

- Local dissemination the warning
- Access/Receive-ability and understanding the warning and warning messages
- Validation of the warning
- Trust/faith on the EW
- Taking appropriate action/response to the warning
- Warning for people with special need and diversity
- Feedback to assess impacts
- Ownership of the EWS

Considerations for message disseminations

Targeting populations-at-risk, dissemination for warning should take into account:

- Who are the recipients
- Where people are located
- What activities people are performing
- Time of the day.
- Season (e.g., peak tourist season)
- What mode people rely upon to receive information
- What special needs people may have
- Level of understanding and acceptance of warning information
- Many more....



Paradox!!

Warning \neq Alert

Warning \neq Action

Warning \neq Awareness \neq Preparedness

..... a systematic understanding is
required.

- Ultimately, the warning should be **capable of interrupting** whatever people are doing, compelling them to understand the threat, and to act as instructed.
- people should **believe** that the warning is truthful and accurate.
- people should **personalize** the message as being relevant to them.
- people should **decide to act** and overcome any constraints to taking the advised action(s).
- And the EWS is **owned by the community** and **co-managed jointly** with community and internal-external duty bearers .

Warning must be viewed as part of an
“integrated system” and not simply a scientific technology rather a **“science-
institution-societal system”**

The success of a EWS depends on **“what actions are taken by the people in
their communities”**

Thank You

Atiq Kainan Ahmed
Programme Specialist (Early Warning Systems), ADPC.
Email: atiqka@adpc.net