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From DM to DRR: An Overview

Disasters: What are they…?

• Origin from French word DESASTRE – Meaning ‘bad star’

• Sudden or great misfortune calamity … calamity (Concise Oxford Dictionary)

• Sudden calamitous event producing great material damage and distress (Webster)

The Traditional Thinking

- Traditional concerns considered disasters as "interruptions" in normal functioning
- Disasters seen in the context of emergency response
- Development programmes as "peace-time" operations.
- Development programmes not assessed in the context of disasters.
- Communities under disaster stress were considered too turbulent for development initiatives.

As a result…

- We waited for disasters to strike…

- Impact
  - Loss of valuable resources (human, economic)
  - Disruption of economic activities
  - Loss/disruption of livelihood
  - Adverse effect on investment climate
  - Loss of years of development benefits.
  - Political destabilization

Devastations

Muzaffarabad Earthquake 2005

Destructions

Orissa Super Cyclone 1999

Damages

Kobe Earthquake 1995

Japan Tsunami March 2011

Sufferings

Nepal- Bihar Flood 2008

What did we do?

- We managed the event:
  - Food & medical aid
    - Basic dry/wet rations
    - Special needs for vulnerable groups were rarely met
    - Govt led, allegations of inequitable distribution
  - Relief Camps
    - Basic facilities
    - No standards for individual/private space
  - Reconstruction
    - To the same condition as it was before the disaster struck

The Global Agenda…

- **1989: UN General Assembly announces**
  International Decade for Natural Disaster Reduction (IDNDR,1990-1999) – promotion of disaster reduction, technical and scientific innovations for disaster management

- **1994: First World Conference on Disaster Reduction:**
- **Yokohama Strategy and Plan of Action** – Mid-term review of IDNDR, first blueprint for disaster reduction policy guidance (social and civil society orientation)
  - Global Culture of Prevention
  - Adoption of prevention, preparedness and response
  - Promotion of regional cooperation and participation of private sector, NGOs and civil society.
  - Development and strengthening of human resources and material capabilities
  - Improved risk assessment, broader monitoring and comunication of forecasts

The New Millennium

- **Millenium Development Goals**
  - Ending poverty and hunger
  - Gender equity,
  - Maternal & child health,
  - Education
  - HIV/AIDS prevention
  - Environmental sustainability
  - Partnership actions

- **2000: International Strategy for Disaster Reduction (ISDR)** - increased public commitment and linkage to sustainable development, enlarged networking and partnerships. **Institutional mechanisms:** IATF/DR, ISDR secretariat, UN Trust Fund for Disaster Reduction

HFA 2005-15

- World Conference on Disaster Reduction 18-22 January Kobe, Hyogo, Japan, 2005
- Hyogo Framework for Action 2005-15

  - ✓ Ensure that disaster risk reduction is a national and a local priority
  - ✓ Identify, assess and monitor disaster risks and enhance early warning
  - ✓ Use knowledge, innovation and education to build a culture of safety and resilience
  - ✓ Reduce the underlying risk factors.
  - ✓ Strengthen disaster preparedness for effective response at all levels.

From Yokohama to Hyogo

- Disaster Risk Management: The systematic process of using administrative decisions, organization, operational skills and capacities to implement policies, strategies and coping capacities of the society and communities to lessen the impacts of natural hazards and related environmental and technological disasters.

- **Disaster risk reduction:** The conceptual framework of elements considered with the possibilities to minimize vulnerabilities and disaster risks throughout a society, to avoid (prevention) or to limit (mitigation and preparedness) the adverse impacts of hazards, within the broad context of sustainable development

Third UN World Conference on Disaster Risk Reduction The Sendai Framework was adopted by UN Member States on 18 March 2015 at the Third UN World Conference on Disaster Risk Reduction in Sendai City, Miyagi Prefecture, Japan.

The Sendai Framework is the successor instrument to the Hyogo Framework for Action (HFA) 2005-2015: Building the Resilience of Nations and Communities to Disasters. It is the outcome of stakeholder consultations initiated in March 2012 and inter-governmental negotiations held from July 2014 to March 2015, which were supported by the UNISDR upon the request of the UN General Assembly.

The Indian Approach

Disasters & the Indian Ethos

- Disasters integral part of living in India
- High profile disasters like earthquake, cyclone, flood, landslide, avalanche take heavy toll of life.
- Silent disasters like drought, starvation, epidemics, infant & maternal mortality take even heavier toll of life.
- Communities have learnt to cope with the disasters, but more often they are resigned to their fate
- Similar attitude of fatalism seem to have pervaded State Policy or lack of it till the nineties.

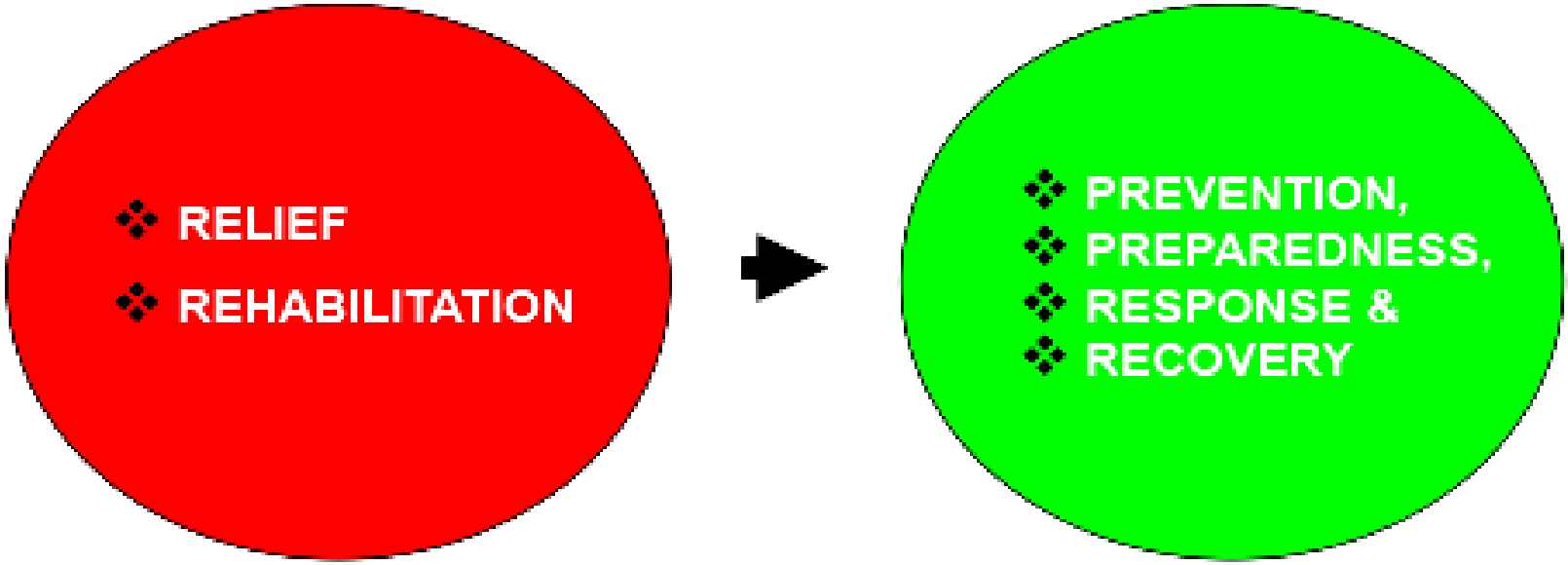
DM in India

- Originated with drought response
  - Famine Commission 1878 AD
  - Famine Codes 1883 AD
- Post Independence
  - Under DAC, Ministry of Agriculture
  - Scarcity Relief Division
  - Natural Disaster Management (NDM) Div
- Since June 2002
  - Nodal responsibility MHA (except drought)
  - National Disaster Management (NDM) Div
  - National Disaster Management Authority

Initiatives after IDNDR...

- The Reports of the High Powered Committee (HPC) and National Committee on Disaster Management (chaired by PM) identified wide-ranging issues and concerns.
  - Shift in focus from from reactive response oriented action to proactive prevention, preparedness and mitigation oriented action.
  - Mainstreaming of Disaster Management into the development process was the major thrust of the HPC reports.
- Planning Commission accepted the need for a Safe National Development
  - A Chapter on Disaster Management incorporated in the Tenth Plan document.

The paradigm shift



The New Paradigm

- Multi-disciplinary & multi-sectoral approach
- Incorporate risk reduction in development process to make it sustainable
  - Development cannot be sustainable unless disaster mitigation is built in the development process.
  - Objective is that hazards may be prevented from turning into disasters by taking mitigation and preparedness measures.
- Holistic mitigation spanning across all sectors of development

Central Legislation- The Disaster Management Act, 2005

- The Disaster Management Bill, 2005 was introduced in the Rajya Sabha on 11.5.2005 and notified on December 26, 2005.
- The Act aims to put in place requisite institutional mechanism for a holistic and coordinated approach to disaster management and prompt response to any disaster situation.

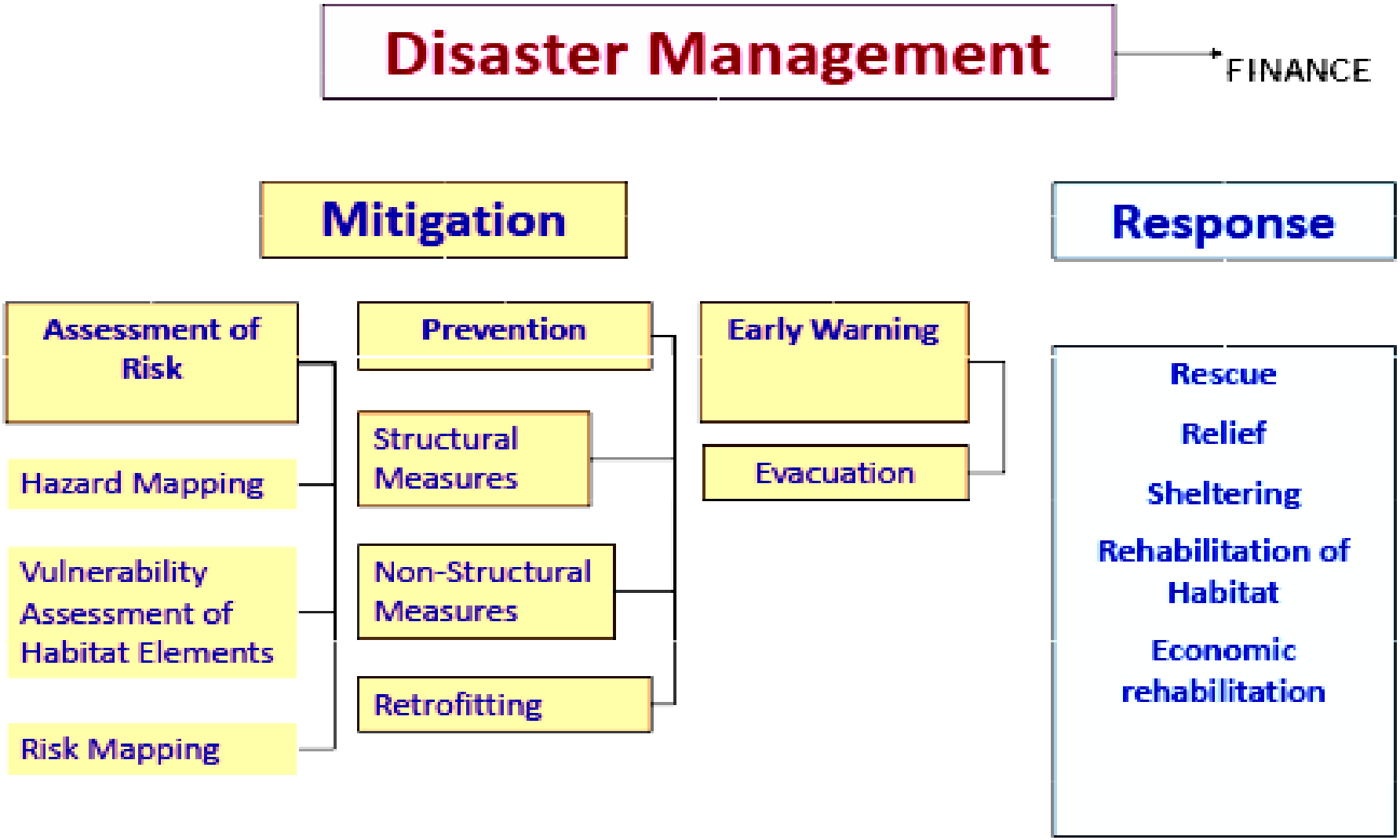
Legal-institutional framework

- National Disaster Management Authority
- State Disaster Management Authority
- District Disaster Management Authority
- National Disaster Response Force
- National Response Fund
- National Disaster Mitigation Fund
- National Institute of Disaster Management

A Disaster is...

"Disaster means a catastrophe, mishap, calamity or grave occurrence in any area, arising from natural or man-made causes, or by accident or negligence, which results in substantial loss of life or human suffering, or damage to, and destruction of, property, or damage to, or degradation of environment, and is of such nature or magnitude, as to be beyond the coping capacity of the community of the affected area."

DM Act 2005


Disaster Management
FINANCE
Mitigation
Response
Assessment of Risk
Hazard Mapping
Vulnerability Assessment of Habitat Elements
Risk Mapping
Prevention
Structural Measures
Non-Structural Measures
Retrofitting
Early Warning
Evacuation
Rescue
Relief
Sheltering
Rehabilitation of Habitat
Economic rehabilitation

Urban risks
Facets and dimensions

Risks

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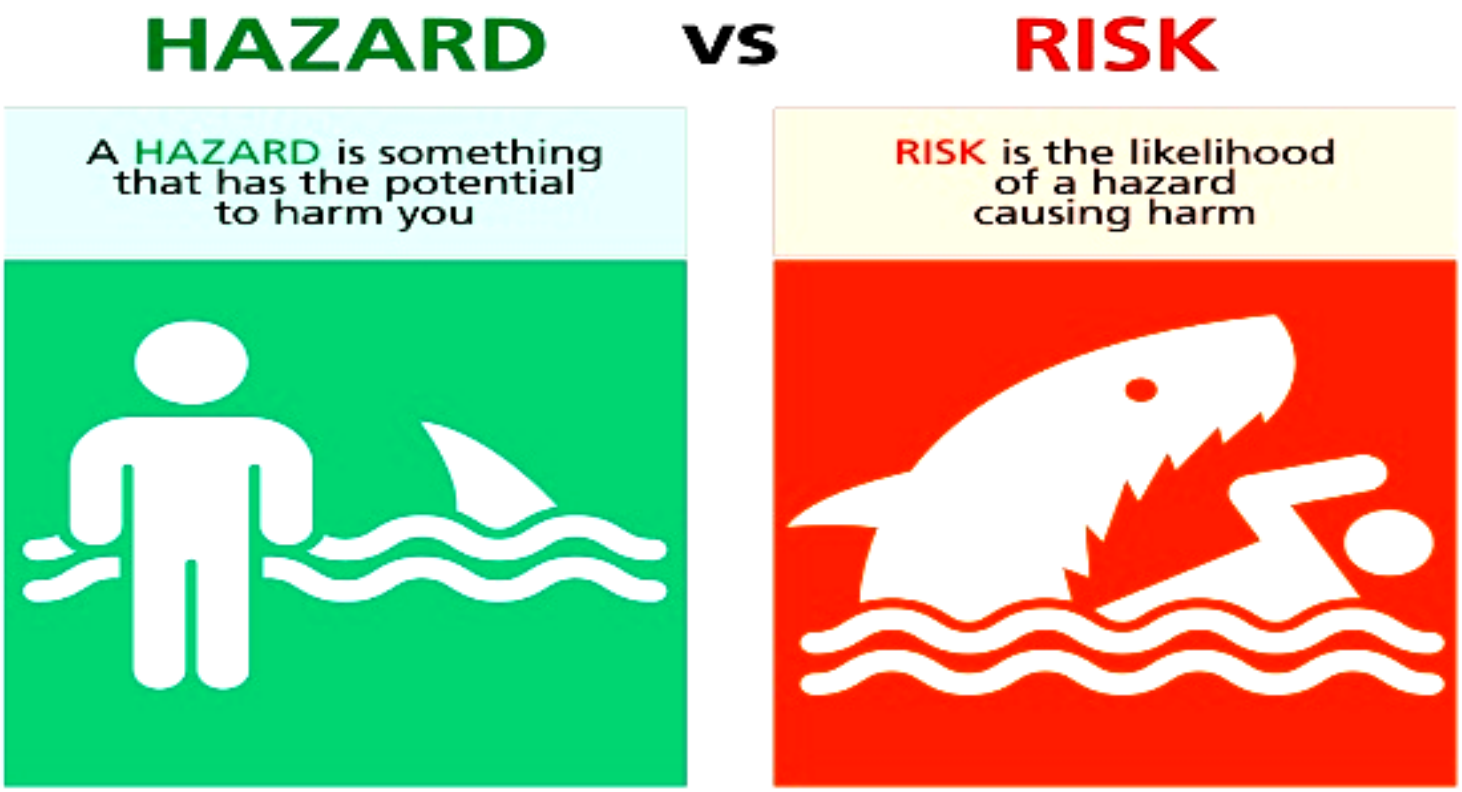

Risks

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The product of hazards over which we have no control.

It combines:

- the likelihood or probability of a disaster happening
- the negative effects that result if the disaster happens
  - these are increased by *vulnerabilities (characteristics/circumstances that make one susceptible to damaging effects of a hazard)*
  - and decreased by *capacities (combination of strengths, attitudes and resources)*

What is risk?

Risk is the probability of harmful consequences, or expected losses (deaths, injuries, property, livelihoods, economic activity disrupted or environment damaged) resulting from interactions between natural or human-induced hazards and vulnerable conditions.

Risk = Hazards x Vulnerability - Capacity

DISASTERS IN URBAN AREAS

- Impact magnified
(concentration of people, buildings, activities, infrastructure)
- Complex Emergencies
- Multiplicity of authorities
- Low Awareness levels
- Community capacities untapped

Urban risk factors

- Location of towns in hazard maps
  - Seismic – flood - cyclonic – landside zone
- Types of constructions
  - Engineered - non-engineered - structural safety
  - non-structural elements - fire safety
- Human development
  - Poverty - education - health
- Infrastructure
  - Drainage - road - solid waste management
  - water - sewerage - power - hospitals - fire brigade
- Crime, public order, terrorist violence
- Urban governance

Urban earthquakes

"With few exceptions (Tokyo 1923; Tangshan, 1976), recent large earthquakes (M>7.5) have spared the world's major urban centers. This will not persist indefinitely. In the next millennium several mega cities will be damaged by significant earthquakes. We are most certain of the fate of those cities near plate boundaries, however, mid-continent earthquakes also occur, albeit infrequently (c.f. M>8 events in the eastern US and India in the early 18th century), and these events will wreak great havoc in mid-continent cities where earthquake resistant construction is not mandated".

Bilham, R., Earthquakes and Urban Growth, *Nature*, 336, 625-626, 1988.

Urban flooding

Natural : heavy rainfall in cities and catchments areas

Manmade : unplanned growth, dam discharge, paved surfaces > low infiltration >faster run off, inadequate drainage

Cyclones in coastal cities

Urban landslide

Urban epidemics

- Supply of safe potable water and sanitation arrangements are two biggest challenges of cities in developing countries
- Problem is compounded by inadequate solid waste disposal system
- Result is poor public health standard, often reflected in epidemics like cholera, malaria, plague etc

Chemical disasters

Bhopal gas tragedy

- 2,000 people died immediately
- Another 13,000 died next fifteen years
- 10-15 persons dying every month
- 520,000 diagnosed chemicals in blood causing different health complications
- 120,000 people still suffering from
  - Cancer
  - Tuberculosis
  - Partial or complete blindness,
  - Post traumatic stress disorders,
  - Menstrual irregularities

Terror attacks

Nuclear and biological disasters

- Cities of the world, particularly large cities are increasingly getting exposed to nuclear threats
- Threats of pandemics like avian flu and human induced biological disasters are also looming large

Slow onset disasters?...

- Air pollution and mobility crisis
  - Vehicular pollution
  - Congestion costs
- Solid Waste Disposal
  - 120,000 tonnes of garbage daily in Indian cities
  - Limited disposal, recycling culture
  - Waste to energy remains a non-starter
- Water: Per capita water supply ranges from 9 lpcd to 584 lpcd in Indian cities
- Energy crisis
- Land constraint: Urban sprawl

Delhi Pollution

equivalent to **smoking**
44 cigarettes/day

Menacing foam engulfs Marina beach, Chennai

Bengaluru: Varthur lake spilling toxic foam yet again

“Clean River Umkhrah Mission”

Urban risk mitigation
Approaches and issues

Prevention and Mitigation : Structural and non-structural

Structural measures refer to any physical construction to reduce or avoid possible impacts of hazards, which include engineering measures and construction of hazard-resistant and protective structures and infrastructure.

Non-structural measures refer to policies, awareness, knowledge development, public commitment, and methods and operating practices, including participatory mechanisms and the provision of information, which can reduce risk and related impacts.

Each of the urban disasters have specific structural and non-structural measures for mitigation

Preparedness

- Early Warning System
- Pre-Disaster Planning
  - Search and rescue
  - Evacuation
  - Temporary shelter
  - Emergency medial relief
  - Caracas disposal
  - Debris disposal
  - Damage assessment
  - Restoration of utilities
- Standard Operating Procedure defining role and functions of each agency and individuals
- Training and re-training
- Mock drills

Our goal

- We can not prevent natural hazards and the risks associated with these hazards, since these are endemic to our geo-climatic conditions
- We can not altogether prevent natural or man made disasters since there are complex web of factors which can not always be anticipated even with best of structural and non-structural mitigation measures
- But we can certainly make efforts to keep the impact of disasters to its minimum, so that cities are able to cope with it with minimum adverse effects.
- Our goal is to make our cities resilient – they may bend for some time, but they should never break down.

How to do it?

- Make communities aware of their risks
- Encourage local initiatives of RWAs etc
- Take up urban CBDRM programmes
- Make local level disaster preparedness plans
- Involve schools in safety programmes
- Involve hospitals, civil defence, fire service
- Take up innovative Public-Private-Partnership in disaster risk reduction

Thanks

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