

Scope

- Introduction
- Definition
- Classification & Types of Disasters
- Disaster Management
- Disaster Preparedness
- Medical and Public Health Response
- Public Health Impact of Disaster
- Disaster Mitigation
- Disasters in India
- Disaster Management in India
- Safety tips in major disaster situation
- References

Introduction

- Disasters are as old as Mankind.
- The first description of Disaster and its management comes from mythological “Noah” and his ark.
- Similar Flood tales are widespread in- Greek Mythology, Puranas, Mesopotamian stories, and many cultures.



Introduction

Etymology

*Originated from Greek
dus = bad aster = star*

Calamity due to position of a planet or a star.

*Then evolved in Italian as disastro,
To become French désastre (de.zastʁ).
& then disaster .*

Definition

Disaster -

Any occurrence that causes
damage, ecological disruption,
loss of human life,
deterioration of health and health services
on a scale, sufficient to warrant an extraordinary
response from outside the affected community or
area.(WHO)

A disaster can be defined as an occurrence
either nature or man made that causes human
suffering and creates human needs that victim
cannot alleviate without assistance.

(American Red Cross)

Definition

Hazard -

Any phenomenon that has the potential to cause disruption or damage to people and their environment.

"A hazard is natural event while the disaster is its consequence. A hazard is perceived natural event which threatens both life and property.....

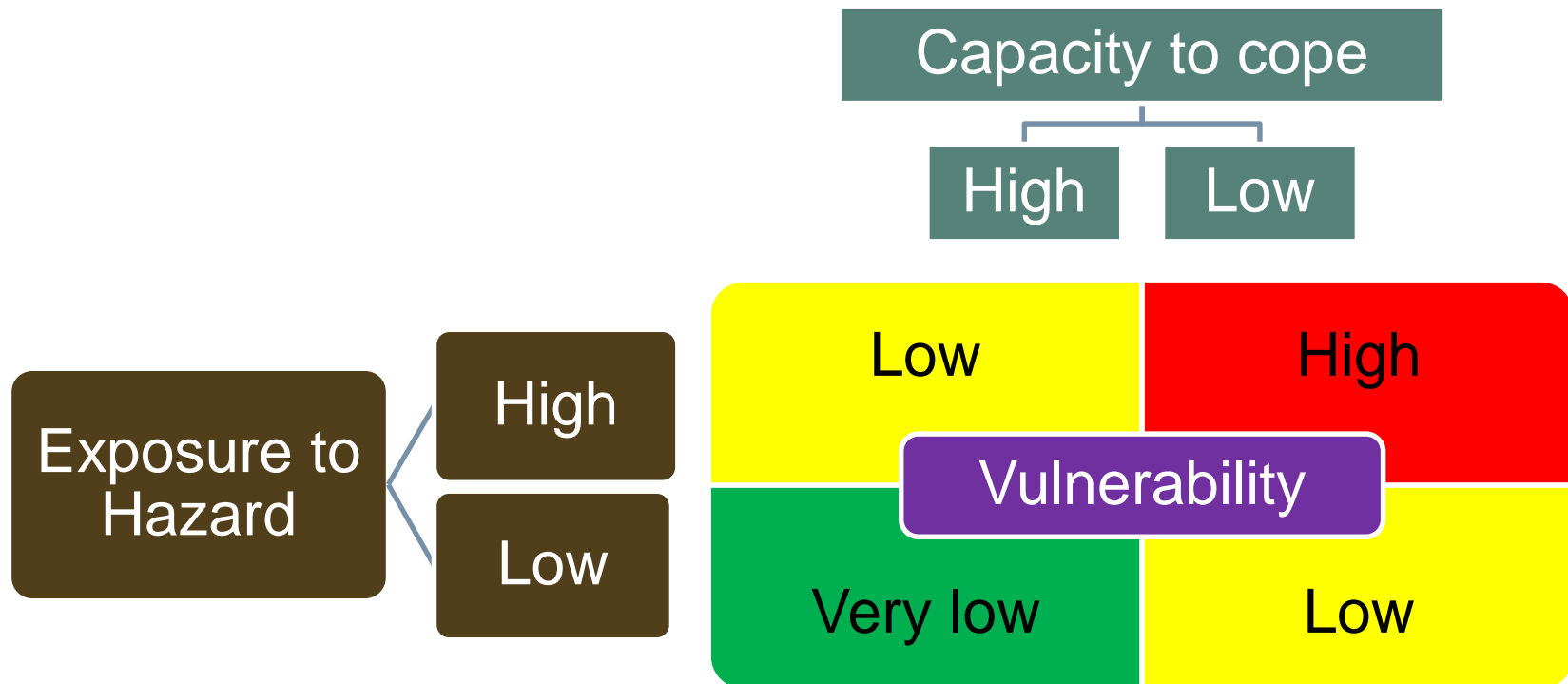
A disaster is a realization of this hazard."

-John Whittow

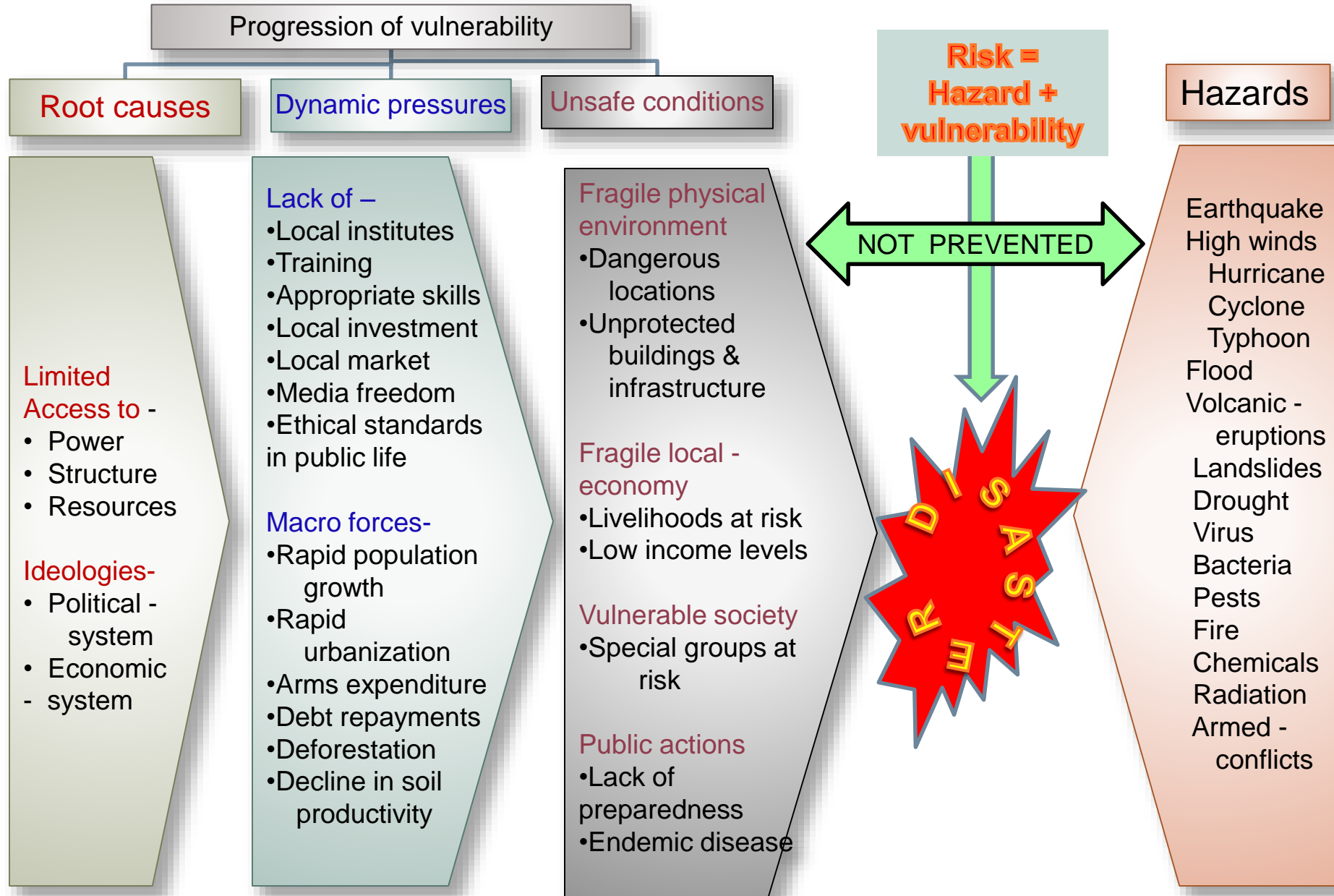
- When hazard involves elements of risks, vulnerabilities and capacities, they can turn into disasters.
- Hazards may be inevitable but disasters can be prevented.

Vulnerability

The propensity of things to be damaged by a hazard.



Disaster occurs when hazards meet vulnerability



Classification of Disasters



Natural Disasters

Meteorological

Topographical

Environmental



Man made Disasters

Technological

Industrial

Warfare

Natural Disasters

Meteorological Disasters

- Floods
- Tsunami
- Cyclone
- Hurricane
- Typhoon
- Snow storm
- Blizzard
- Hail storm

Topographical Disasters

- Earthquake
- Volcanic Eruptions
- Landslides and Avalanches
- Asteroids
- Limnic eruptions

Environmental Disasters

- Global warming
- El Niño-Southern Oscillation
- Ozone depletion-UV-IR Radiation
- Solar flare

Man made Disasters

Technological

- Transport failure
- Public place failure
- Fire

Industrial

- Chemical spills
- Radioactive spills

Warfare

- War
- Terrorism
- Internal conflicts
- Civil unrest

Disaster Management

The body of policy and administrative decisions and operational activities that pertain to various stages of a disaster at all levels.

An applied science which seeks, by systemic observation and analysis of disasters, to improve measures relating to prevention, emergency response, recovery and mitigation.

Encompasses all aspects of planning for, and responding to disasters, including both pre and post disaster activities.

Disaster Management

A continuous and integrated process of planning, organizing, coordinating and implementing measures which are necessary for-

- Prevention of danger or threat of any disaster.
- Reduction of risk of any disaster or its severity or consequences.
- Capacity-building.
- Preparedness to deal with any disaster.
- Prompt response to any threatening disaster situation
- Assessing the severity or magnitude of effects of any disaster.
- Evacuation, rescue and relief.
- Rehabilitation and reconstruction.

Activities that reduce effects of disasters

- Building codes & zoning
- Vulnerability analyses
- Public education

Mitigation

**Prepared-
ness**

Activities prior to a disaster.

- Preparedness plans
- Emergency exercises
- Training,
- Warning systems

**Integrated
Disaster
Management**

Response

Activities during a disaster.

- Public warning systems
- Emergency operations
- Search & rescue

Recovery

Activities following a disaster.

- Temporary housing
- Claims processing
- Grants
- Medical care

PHASES OF DISASTER MANAGEMENT

Disaster Preparedness

Disaster Impact

Disaster Response

Disaster Recovery

Disaster Mitigation

Disaster Preparedness

Disaster preparedness - is ongoing multisectoral activity.

Integral part of the national system responsible for developing plans and programmes for

disaster management,

prevention,

mitigation,

response,

rehabilitation and

reconstruction.



Disaster Preparedness

Co-ordination of a variety of sectors to carry out-

- Evaluation of the risk.
- Adopt standards and regulations.
- Organize communication and response mechanism.
- Ensure all resources- ready and easily mobilized.
- Develop public education programmes.
- Coordinate information with news media.
- Disaster simulation exercises.

Medical Preparedness & Mass Casualty Management

- Developing and capacity building of medical team for Trauma & psycho-social care, Mass casualty management and Triage.
- Determine casualty handling capacity of all hospitals.
- Formulate appropriate treatment procedures.
- Involvement of private hospitals.
- Identify health care centers that can function as a medical units.
- Identify structural integrity and approach routes.

Disaster Response

Immediate reaction to disaster as the disaster is anticipated, or soon after it begins in order to assess the needs, reduce the suffering, limit the spread and consequences of the disaster, open up the way to rehabilitation.

By-

- Mass evacuation
- Search and rescue
- Emergency medical services
- Securing food and water
- Maintenance of Law & Order



Disaster Impact & Response



Medical and Public Health response

- Pre-hospital emergency services -
 - Linkage to govt. incident command system.
 - External medical services and extrication workers.
 - Search and Rescue teams.
- Assessment of immediate health needs.
- Identification of medical & health resources.
- Temporary field treatment
 - Prompt and proper treatment to save lives.



EVACU-AIDTM TRIAGE TAG

Respirations ☐ Yes ☐ No

Perfusion ☐ +2 SEC ☐ -2 SEC

Mental Status ☐ Can do ☐ Can't do

Mark * ORIENTED ☐ Dis

Time Pulse

Time

Drug Solu

Major Injuries:

Destination:



EVACU-AIDTM TRIAGE TAG

Respirations ☐ Yes ☐ No

Perfusion ☐ +2 SEC ☐ -2 SEC

Mental Status ☐ Can do ☐ Can't do

Mark * ORIENTED ☐ DISORIENTED ☐

Time Pulse

Time

Drug Solution

Major Injuries:

Destination:

CONTAMINATION:
NO ☐ YES ☐
Circle type below



Chemical



Radioactive



Biological

UNCONSCIOUS ☐

Respiration

Dosage

DECEASED

IMMEDIATE

DELAYED

MINOR

DECEASED

IMMEDIATE

DELAYED

MINOR

IMMEDIATE



DELAYED



MINOR



Medical and Public Health response

- Food safety and Water Safety
- Animal control- Deadbodies can foul water,
Zoonotic diseases.
- Vector control- Mosquito and Rodents
- Communicable disease control:
Measles, diarrheal diseases, ARI, and malaria
Breakdown in environmental safeguards.
Crowding of persons in camps, Malnutrition.
- Waste management
 - Temporary latrines
 - Chemical toileting
 - Sewage disposal damage.
- Immunization – Mass immunization its not recommended

Medical and Public Health response

- Management of hazardous agent exposure
 - Particular matter
 - Also Infectious agents if hospital or scientific laboratories damaged
- Mental health
 - Specialized psychological triage and treatment significant in terrorism.
- Information
 - Behavioral Contagion handling
 - Risk communication

Consequences of Disaster

- **Health -**

 - **Physical** – Entanglement, Injuries, Disabilities, Coma ,Death.

 - **Psychological**- Cognitive, Behavioral, Social.

- **Structural Damage** – to variable extent.

- **Ecological**- Changes in eco system.

- **Economical**-Financial losses.

Symptoms after disaster

Physiological Symptoms

- Fatigue
- Shock symptoms
- Profuse sweating
- Fine motor tremors
- Chills
- Teeth grinding
- Muscle aches
- Dizziness

Cognitive Symptoms

- Memory loss
- Distractibility
- Reduced attention span
- Decision making difficulties
- Calculation difficulties
- Confusing trivial with major issues

Emotional Symptoms

- Anxiety
- Feeling overwhelmed
- Grief
- Depression
- Anticipation of harm to self or others
- Irritability

Behavioral Symptoms

- Insomnia
- Substance abuse
- Gallows humor
- Gait change
- Ritualistic behavior
- Hyper vigilance
- Unwillingness to leave scene

Factors which may affect reactions

Disaster Related Factors

- Lack of warning
- Scope of the event
- Abrupt contrast of scene
- Personal loss or injury
- Type of disaster
- Traumatic stimuli
- Nature of the destructive agent
- Human error
- Time of occurrence
- Lack of opportunity for effective action
- Environment (temperature, humidity, pollution...)

Host Related Factors

- **Health**
 - Disabled, Invalid
 - Medical problems
- **Social**
 - Lack of support network- Divorced, Widowed
 - Cultural: language barriers
- **Demographic**
 - Age: younger and older have more difficulties
 - Sex: more stress in women, but more resilient
- **Past History**
 - Traumatic events
 - Mental illness or emotional problems

Disasters and Diseases

Epidemic diseases

- ❖ **May be consequences of disasters.**
 - outbreak of diarrheal disease after flooding in Bangladesh in 2004 involved >17,000 cases;
 - A large (>16,000 cases) cholera epidemic (O1 Ogawa) in West Bengal in 1998 preceding floods
 - Leptospirosis outbreak following flooding in Mumbai, India, in 2000
- ❖ **Some tend to become pandemics,**
 - Spanish flu killed 50 million people in 1918-1919, more than those died in precedent First World War.

Communicable Diseases after Disasters

Pre existing Diseases in the Population :

dysentery, cholera, measles, tuberculosis, malaria, intestinal parasites, scabies, skin infections.

Ecological Changes :

- Altered ecology- vector borne and water borne diseases
- Living conditions - plague, louse borne typhus and relapsing fever.
- Stray animals and wild animal displacement- rabies.

Damage to public Utilities :

Water supplies & sewage disposal disrupted.

Communicable Diseases after Disasters

Population Movements :

- Introduction of new disease or vector.
- In settlements - diarrheal diseases , measles, viral hepatitis, whooping cough, malaria etc.

Interruption in Public Health Services :

- Disruption of curative and preventive services.
- Interrupted vector control - malaria, dengue
- Interrupted immunization - measles, whooping cough, and diphtheria.

Altered Individual Resistance to diseases :

- Malnutrition increases susceptibility to diseases .

Diseases after Man Made Disasters

- Will depend upon particular exposure type.
- Symptoms and diseases differ widely.
- Spectrum may range from simple non fatal injuries to chromosomal defects.
- Again technology that is capable of producing mass destruction weapons and developments in biotechnology leading to invention of deadly bio-attack organisms ,is of ever growing concern for world .

Other Public Health Impacts of Disasters

- **Sexual violence**

- Rape, Exploitation & Sexual violence

- Causes: Separation of women from family

- Weakened social structures

- Increased aggressive behavior

- **Human right violations**

- Torture of civilian

- Physical and psychological harms

- Sex trafficking

- Child labour

- Denial of basic needs

Mental Health Impact of Disasters

- **Post traumatic stress disorder**
 - Stage one- Adrenergic surge.
 - Stage two- Helplessness and a loss of self-control.
 - Stage three - Despondency (dispiritedness) and demoralization.
- **Children** -Developmental age is more important
- **Preschoolers**- Increased arousal, fear.
- **School-age children**- reckless ,psychosomatic signs.
- **Adolescents**- some partake in rescue and recovery, regression & withdrawal possible.
- **Elderly** - increased risk for physical injury, than mental.

Rescue workers in Disaster

- Secondary victims of a disaster.
- Stress reactions seen in non-professionals.
- More emotional trauma if involved in a failed rescue attempts (especially if children are involved).
- Inexperienced body handlers become more sensitive.
- 19 August is observed as World Humanitarian Day in honour of aid workers, who lost their lives.

Disaster Recovery

- **Repatriation** - after the emergency is over, displaced people return to their place of origin.
- **Rehabilitation** -restoration of basic social functions.
 - Providing temporary shelters,
 - Stress debriefing for responders and victims,
 - Economic Rehabilitation,
 - Psycho-social Rehabilitation,
 - Scientific Damage Assessment,
- **Elements of recovery**
 - Community recovery (including psychological).
 - Infrastructure recovery (services and lifelines).
 - Economy recovery (financial, political).
 - Environment recovery.

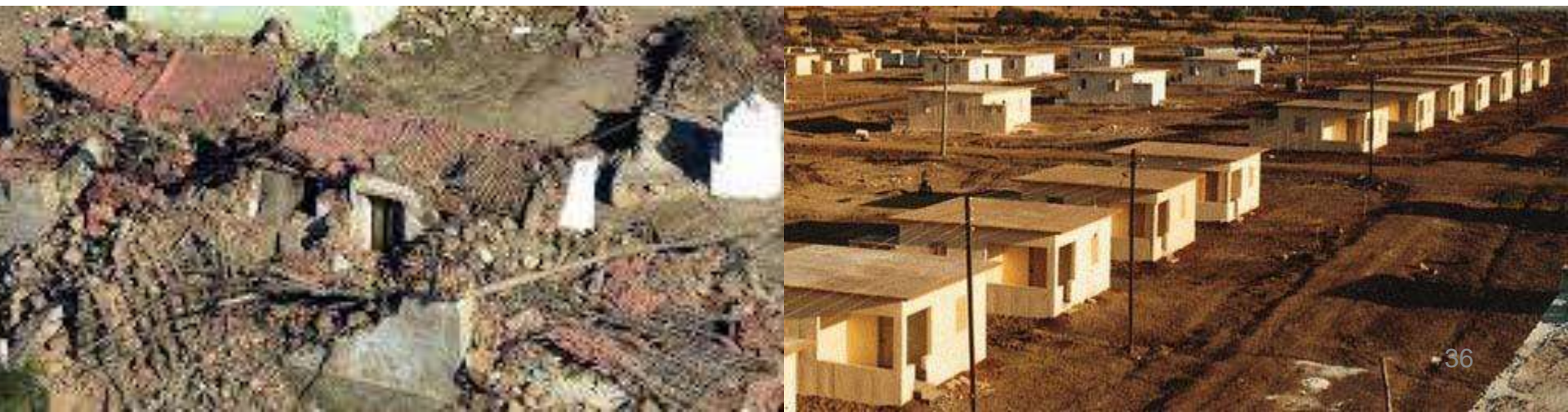
Reconstruction

Rebuilding homes.

Permanently repairing and rebuilding infrastructures.

Elements -

- Owner Driven Reconstruction.
- Speedy Reconstruction.
- Linking Reconstruction with Safe Development.



Disaster Mitigation

Permanent reduction of risk of a disaster, to limit impact on human suffering and economic assets.



- **Primary mitigation** - reducing hazard & vulnerability.
- **Secondary mitigation**- reducing effects of hazard.
- **Components:**
 - **Reducing hazard** - protection against threat by removing the cause of threat.
 - **Reducing vulnerability** - reducing the effect of threat

Natural hazards are inevitable, reduce vulnerability.

Components of Disaster Mitigation

- Hazard identification and mapping –

- Assessment – Estimating probability of a damaging phenomenon of given magnitude in a given area.

Considerations-

- History
- Probability of various intensities
- Maximum threat
- Possible secondary hazards

- Vulnerability analysis –

- A process which results in an understanding of the types and levels of exposure of persons, property, and the environment to the effects of identified hazards at a particular time.

Components of Disaster Mitigation

- Risk analysis –

Determining nature and scale of losses which can be anticipated in a particular area.

Involves analysis of

- Probability of a hazard of a particular magnitude.
- Elements susceptible to potential loss/damage.
- Nature of vulnerability.
- Specified future time period.

- Prevention –

- Activities taken to prevent a natural phenomenon or potential hazard from having harmful effects on either people or economic assets.

Disaster Mitigation Measures

Active measures

- **Promotion of desired actions by -**
 - Planning control.
 - Training & education.
 - Economic assistance.
 - Subsidies.
 - Facilities-refugee points, storage.
 - Public information.

Passive measures

- **Prevent undesired actions by -**
 - Requirement to conform with design codes.
 - Checking compliance of controls on site.
 - Court proceedings
 - Fines, Closure orders
 - Control land use.
 - Denial of utilities in areas development undesired.

VULNERABILITY PROFILE OF INDIA



58 %



16%



12%



8%



3%

<http://www.bmtpc.org/topics.aspx?mid=56&Mid1=180>

Major Disasters in India (last 40 years)

S. N	Event	Year	State & Area	Effects
1	Drought	1972	Large part of country	200 million affected
2	Cyclone	1977	Andhra Pradesh	10,000 people & 40,000 cattle died
3	Drought	1987	15 states	300 million affected
4	Cyclone	1990	Andhra Pradesh	967 died. 435,000 acres land affected
5	Earthquake	1993	Latur, Maharashtra	7,928 people died. 30,000 injured
6	Cyclone	1996	Andhra Pradesh	1000 people died. 5,80,000 houses destroyed
7	Super cyclone	1999	Orissa	Over 10,000 deaths
8	Earthquake	2001	Bhuj, Gujrat	13,805 deaths, 6.3 millions affected

Major Disasters in India (last 40 years)

S. N	Event	Year	State & Area	Effects
9	Tsunami	2004	Coastline TN, Kerala, AP, A&N islands & Puducherry	10,749 deaths.5,640 missing,2.79 Millions
10	Floods	July 2005	Maharashtra	1094 deaths 167 injured, 54 missing
11	Earthquake	2008	Kashmir	1400 deaths
12	Kosi floods	2008	North Bihar	527 deaths,19,323 cattle died
13	Cyclone	2008	Tamilnadu	204 deaths
14	Krishna floods	2009	Andhrapradesh & Karnataka	300 died
15	Flash flood	June 2013	Uttarakhand	5,700 deaths, 70,000 affected
16	Phailin Cyclone	Oct 2013	Coastline of Orissa, Jharkhand	27 died, 10,00,000 evacuations

A few disasters in

INDIA

**Earthquake,
Oct, 2005**

**Avalanche
Feb 2005**

**Bhuj,
Earthquake,
26 January,
2001**

**Floods,
Mumbai,
26 July 2005**

**Earthquake,
Latur, 30
Sept 1993**

**Tsunami
26 Dec 2004**

**Flood,
Uttarakhand
2013**

**Earthquake
Uttarkashi, 20
Oct 1991**

**Flood, Assam
& Bihar 2004**

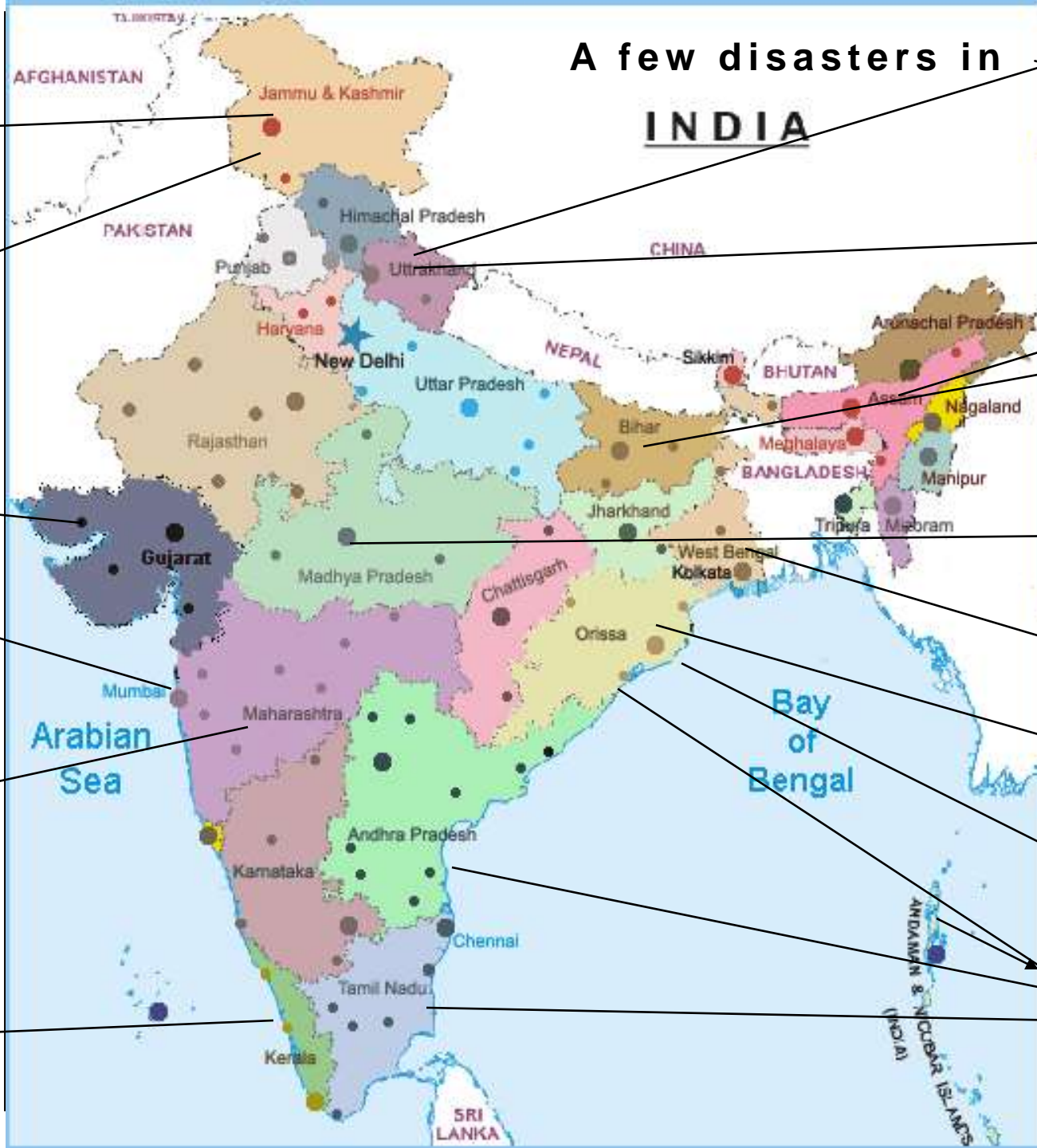
**Bhopal Gas
Tragedy, Dec
1982**

**Alia Cyclone
2009**

**Cyclone
29 Oct 1999**

**PHAILIN
Cyclone 2013**

**Tsunami
26 Dec 2004**



Developments in Disaster Management

High Powered Committee set up in August 1999.

Until 2001 – Responsibility with Agriculture Ministry.

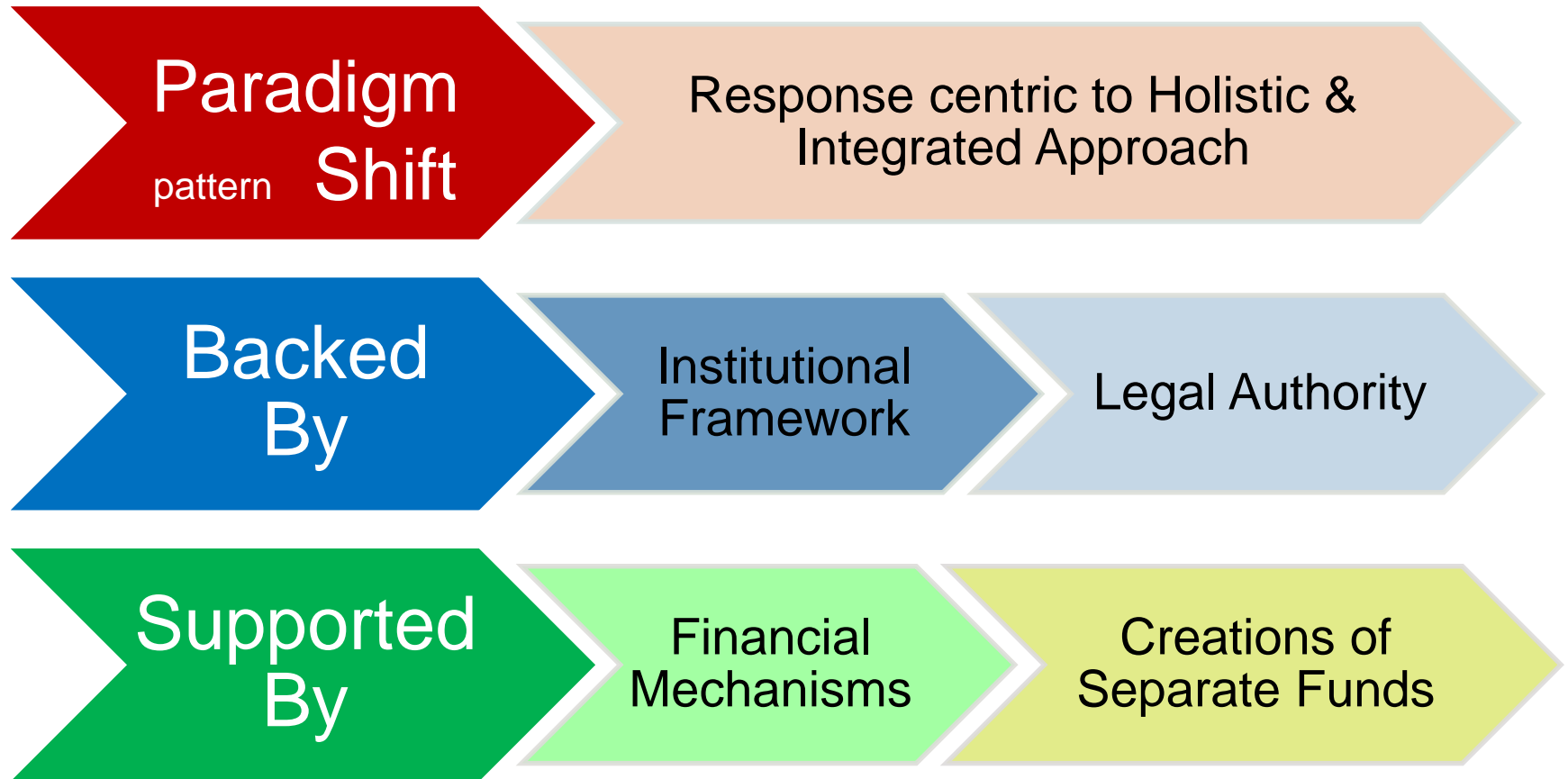
Transferred to Ministry of Home Affairs in June 2002.

National Disaster Management Authority established 28th September 2005.

Inclusion of Disaster Management in the Seventh Schedule of the Constitution.

On 23 December, 2005, Disaster Management Act .

Changes in Disaster Management in India



Institutional Framework

Disaster Management Structure

NDMA Apex Body with Prime Minister as Chairperson.
National Executive Committee - Secretaries of 14 Ministries
and Chief of Integrated Defence Staff.

Centre Level

Central Ministries; National Disaster Management Authority,
National Institute of Disaster Management
National Disaster Response Force (NDRF).

State Level

SDMA headed by Chief Minister.
State Executive Committee (SEC).

District Level

DDMA headed by District Magistrate.
Interface between Govt. and Public.

Nodal Ministries related with Disasters

Type of Disaster	Nodal Ministry
Natural- Flood, Tsunami, Cyclone, Earthquake Manmade-Civil strife	Home Affairs
Drought	Agriculture
Biological, Epidemics	Health & Family Welfare
Chemical, Forest related	Environment & Forest
Nuclear	Atomic Energy
Air Accidents	Civil Aviation
Railway Accidents	Railway
Industrial Accidents	Labour

Mitigation Projects

- Cyclones - 308 Million US \$.(World Bank)
- Earthquakes - Rs. 1597 Cr.
- Pilot Project for School Safety: Rs. 48 Cr.
- Disaster Information & Communication Network - Rs. 821 Cr.

Also projects are being implemented for-

- Landslides.
- Floods.
- Medical Preparedness.
- Creation of National Disaster Response Reserves

Disaster Management in Development

- All new Projects/ Programmes will mandatorily have inbuilt disaster resilience. (at conceptualization level).
- Planning Commission(NITI AYOOG) and the Ministry of Finance to give approval to the projects only if disaster resilience self certification is provided.
- Ongoing Projects to be revisited to include disaster resilience (लवचिकता) audit.
- Infrastructural loans to be sanctioned by the Banks only after due diligence (सर्वोत्तपरी) on disaster resilience audit.

Disaster Management Training

- NIDM(National Institute of Disaster Management, Ministry of Home Affairs,GoI provides Web based training courses.
- Satellite based demonstration cum Training Programme on Disaster Management conducted through Edu-SAT Network.
- Self E-learning courses- @ www.nidmssp.in
 - 1) Basics of Disaster Management
 - 2) Community Based Disaster Risk Management(CBDRM)
 - 3) A Guide for Civil Defense Volunteers
 - 4) A Guide for Public Health Worker
 - 5) School Safety
 - 6) Introduction to Earthquake Risk Mitigation & Management
 - 7) Introduction to Flood Risk Mitigation and Management
 - 8) Introduction to Cyclone Risk Mitigation and Management
 - 9) Introduction to Industrial Chemical Disaster Risk Mitigation and Management
 - 10) Landslide Risk Mitigation and Management

Response and Rescue

National Disaster Response Force (NDRF)

Composition: 10 battalions

Tasks-

Specialized Response during disasters.

Well equipped and trained in search and rescue.

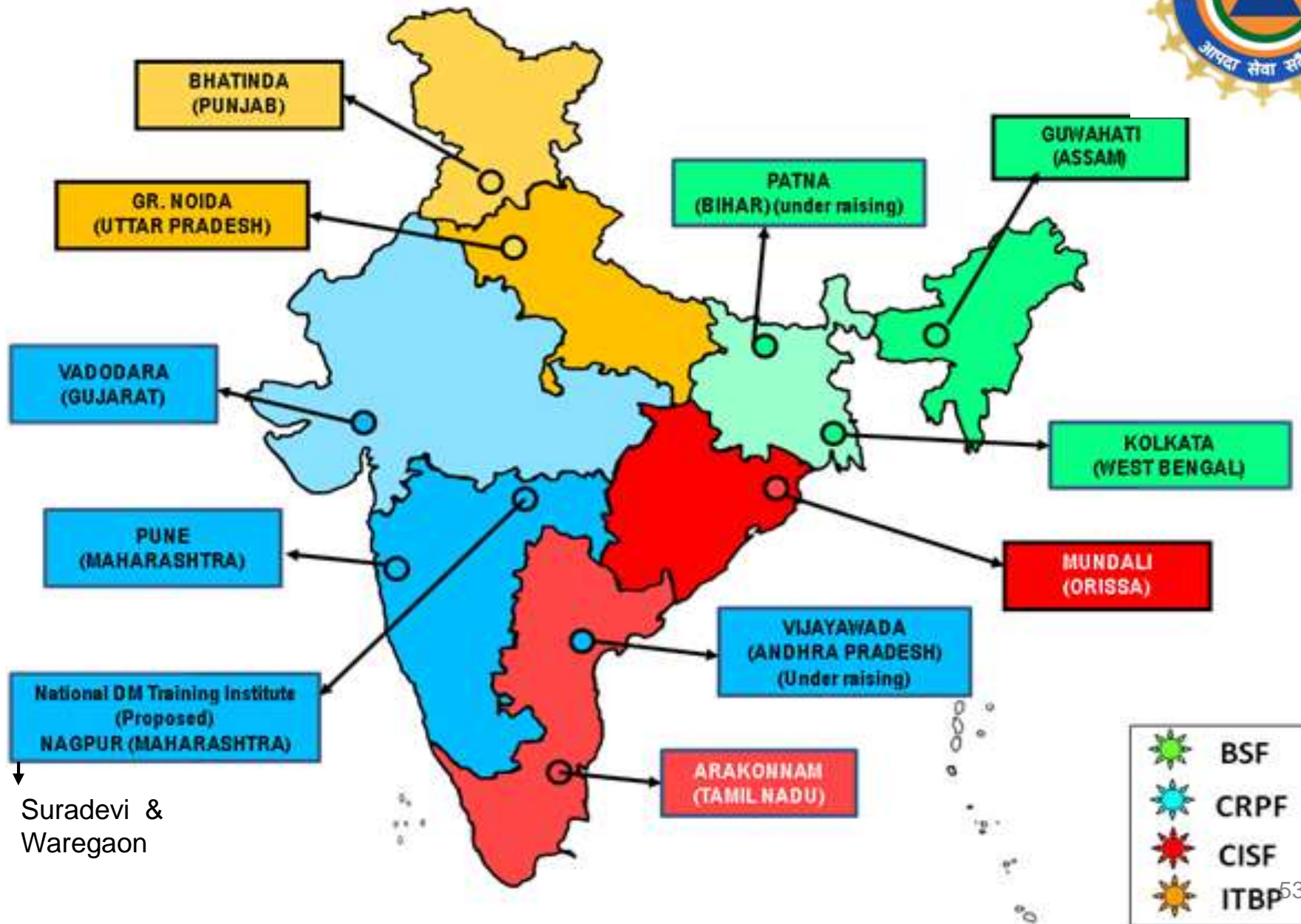
Assist in Community Training & Preparedness.

Impart basic and operation level training to SDRF.

Proactive Deployment during impending disaster situations.

Liaison, Rehearsals and Mock Drills.

NDRF Battalions in India



MOCK DRILLS

Mock Exercises (Districts & Schools)

- Conducted so far 209 (including 80 Schools/ Colleges).
- Community & First Responders: Sensitized 15.0 Lakhs.
- Commonwealth Games - 55 mock drills.



Research For Disaster Management

Involvement of various Universities and Research Institutes to carry out research for Disaster Management

- Case studies and lesson learnt exercises by NIDM
- Preparation of Digital Maps.
- Preparation of Upgraded Hazard Maps.
- Development of GIS Platform for Vulnerability Analysis and Risk Assessment.
- Seismic Microzonation.
- Improved Modeling for Advanced Forecasting Capability.
- National Disaster Management Information System (NDMIS).

Stakeholders' Participation

- Corporate Social Responsibility (CSR)
- Public Private Partnership (PPP)
- Media Partnership
- Training of Communities
- DM Education in Schools

International Co-operation

UN Office for Coordination of Humanitarian Affairs (UNOCHA)
for all international disaster response.

United Nations Development Programme (UNDP),
for mitigation and prevention aspects

UN Disaster Assessment and Coordination (UNDAC) System.
Streamlining Institutional Arrangements for Disaster Response.

The Asian Disaster Reduction Center in Kobe(1998)
to enhance disaster resilience of the 30 member countries,
to build safe communities,
to create a society where sustainable development is possible.

Disaster Reduction Day

- NIDM observes "Disaster Reduction Day" on the Second Wednesday of October.
- UN General Assembly in 2009, designated October 13 as International Day for Disaster Reduction.
- **2015 Theme** -“Knowledge for Life is the local knowledge that helps you to manage disaster risk in your community”.
- **Rallies and lectures for awareness for disaster reduction amongst youth, children and general people.**

Disaster Management in Maharashtra

- SDMA AND SDRF - At conceptual level.
- EOC- Emergency operations Centre at Mantralaya.
All disaster activities handled through Ministry of Relief and Rehabilitation.
- Fire department – Urban Development Ministry.
- PLAN – Relief commissioner in Mantralaya will be assisted by YASHADA
- Supreme Court on 23, Sept. 2013 issued notice to the central government, disaster relief agencies, the meteorological department and some states including Maharashtra, to implement Disaster Management Act.

SAFETY TIPS

Earthquake

- Be calm
- Cover and protect head under desk
- Triangle of life
- Away from pole ,building ,staircase
- Stop vehicles
- Don't use lift

FLOOD

- Turn of electricity
- Get to upper floors
- Get necessary things with
- Move to temp.shelters set
- Be aware of contamination of food water
- Follow authority

STORM

- Move to to shelter like cellar , basement,
- Tie down ,nail,planked movables
- Keep doors and window little open
- Off the electicity
- if in open Get in to a ditch

Summary

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- FOR INFORMATION ON DISASTERS
DIAL TOLL FREE No. 1070
- Contact
NDMA Control Room
26701728,730;Fax-26701729
9868891801,9868101885
controlroom@ndma.gov.in; ndmacontrolroom@gmail.com

WEBSITE

- Republic of India-[http:// ndma.gov.in](http://ndma.gov.in)

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Thank You!