

Disaster Management conceptual frame work and Dev. linkage: Some Case Studies

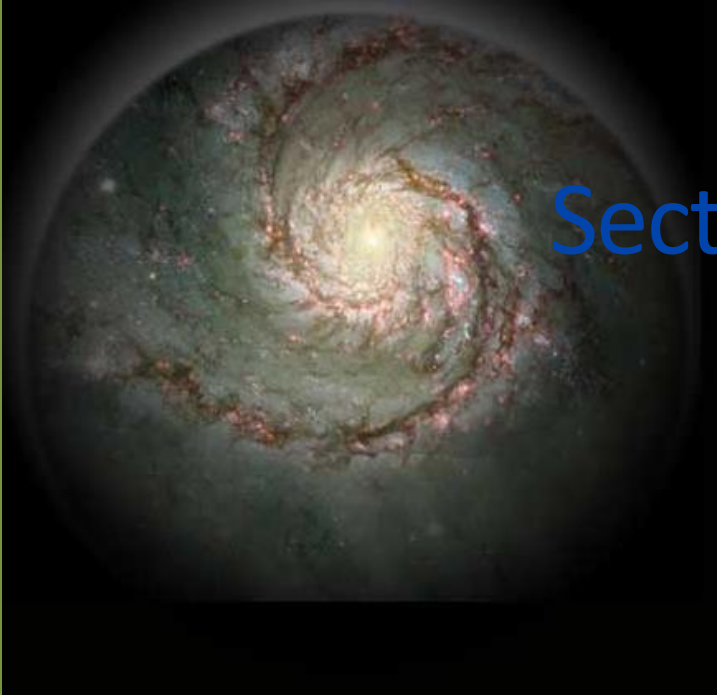
Presentation by:

Dr. Om Prakash

In-Charge

Disaster Management Cell

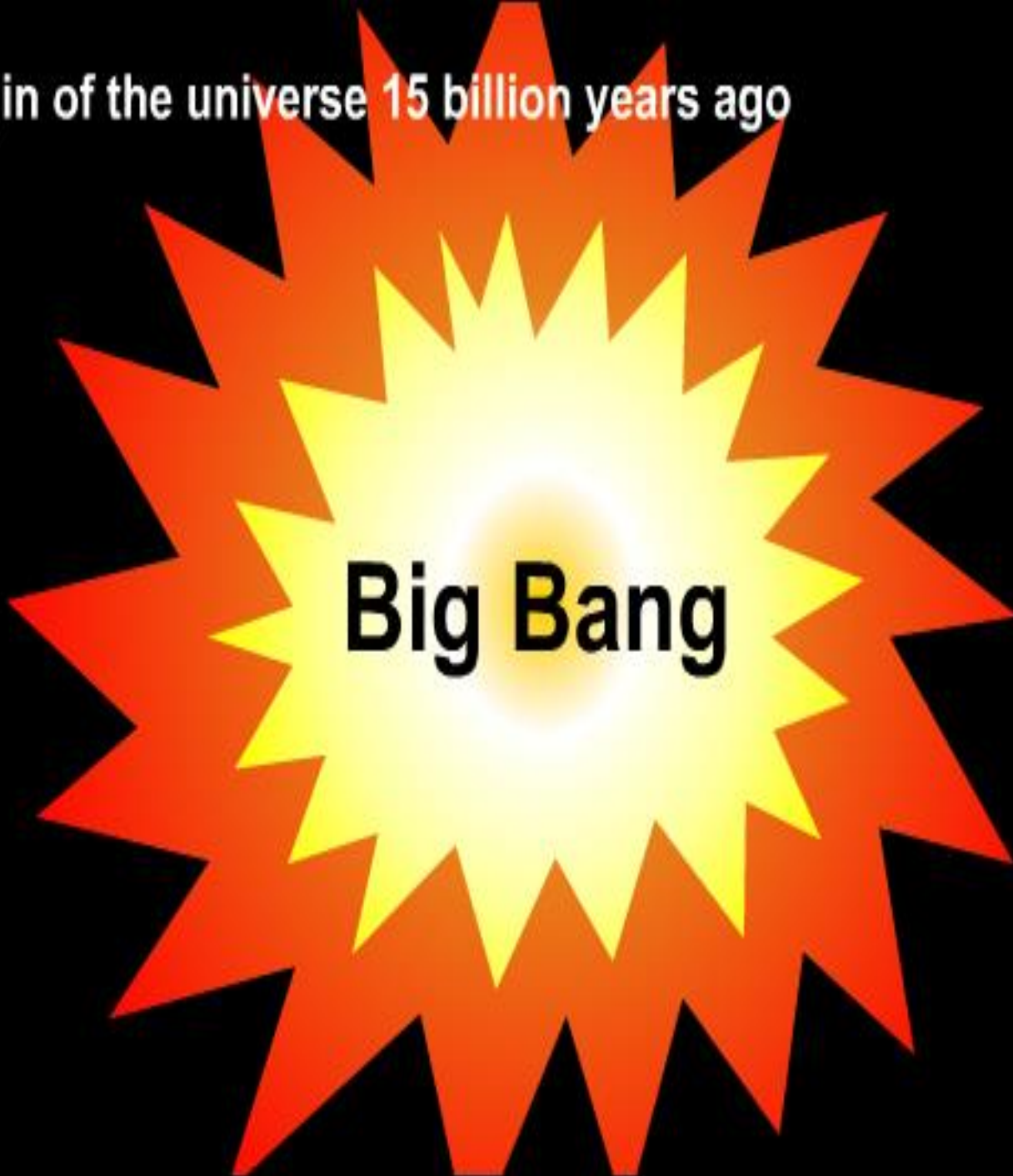
Dr. R.S Tolia Uttarakhand Academy
of Administration, Nainital



Section 1

Understanding disasters

The origin of the universe 15 billion years ago



Big Bang

The theory originated in 1929 when Edwin Hubble discovered

Major Threats of Uttarakhand

Light mag. 3.3 earthquake - 35 km southwest of Joshīmath, Chamoli, Uttarakhand, India, on Thursday, Feb 17, 2022 at 2:24 pm

Epicenter latitude / longitude: 30.27°N / 79.42°E (Chamoli, Uttarakhand, India)

Antipode: 30.27°S / 100.58°W



Map base: Robinson projection SW.jpg by Strebe (Own work) [CC BY-SA 3.0 (<http://creativecommons.org/licenses/by-sa/3.0/>)], via Wikimedia Commons

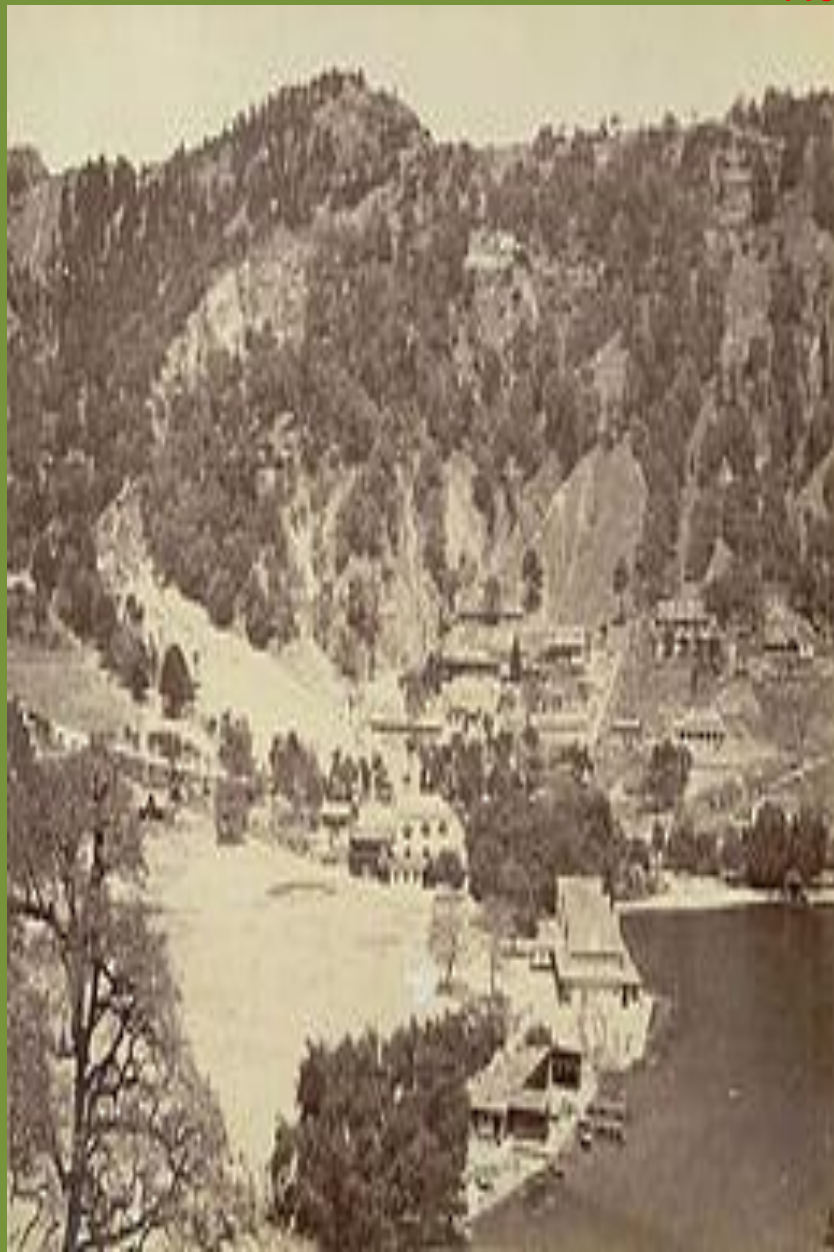
Modified & published under same license by VolcanoDiscovery

Fragile mountains

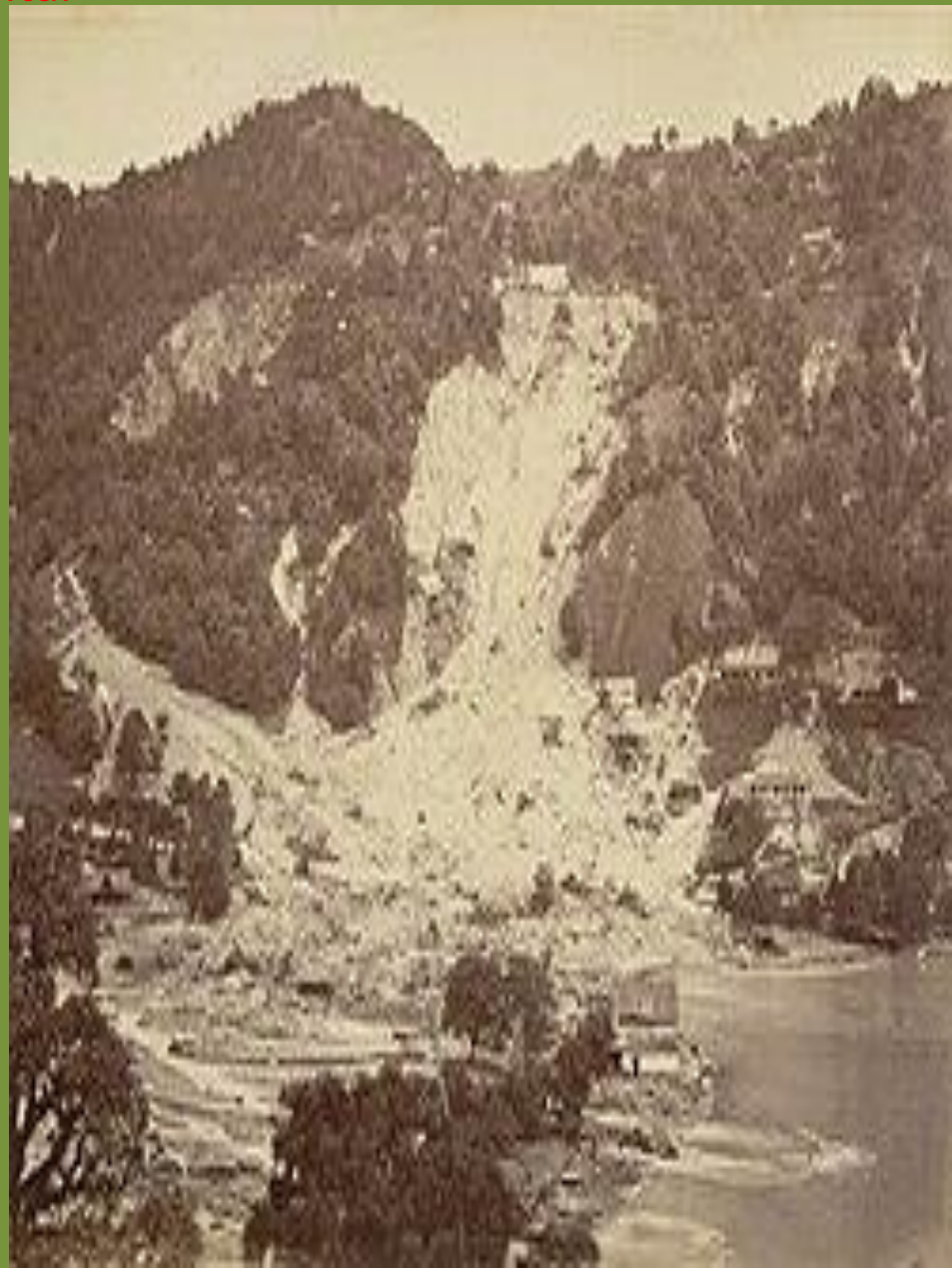
Before

Nainital

After

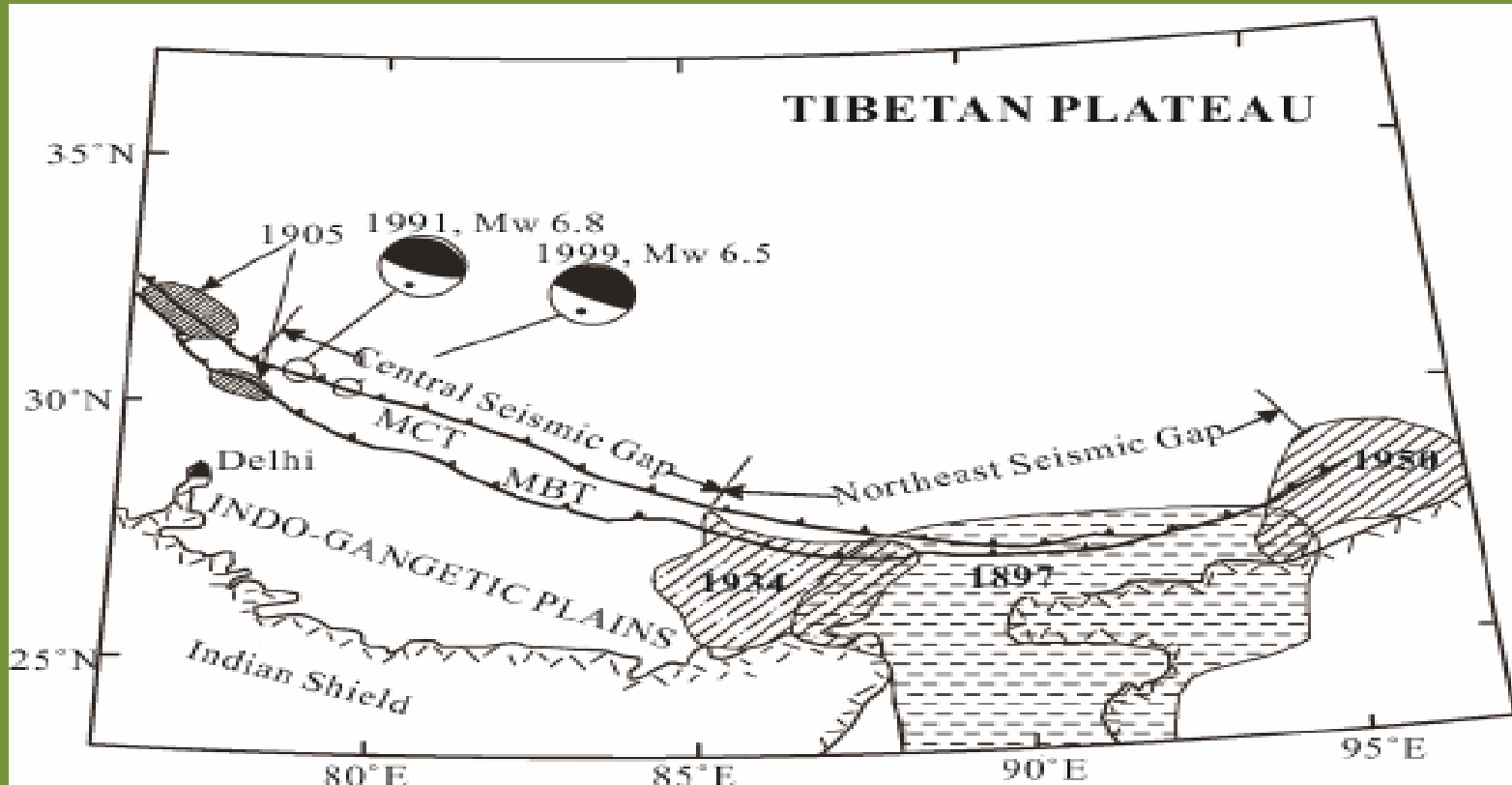


1875



1880

Seismic Gap



A **seismic gap** is a segment of an active fault known to produce significant earthquakes that has not slipped in an unusually long time, compared with other segments along the same structure.

Forest fire



Try artificial rain to douse wildfires: Court to Uttarakhand

The court also directed the government to provide budget to NDRF and SDRF and deploy them as well as helicopters to overcome the fires. The court had directed Rajiv Bhartari the Principal Chief Conservator of Forest of the state to be present virtually in the court. Bhartari informed the court about the policy and technique of fighting the forest fire.

08 Apr, 2021, 11.53 AM IST



**Himalayan Herb
sold at**

₹ 50 Lakh/Kg

**in the international
market**

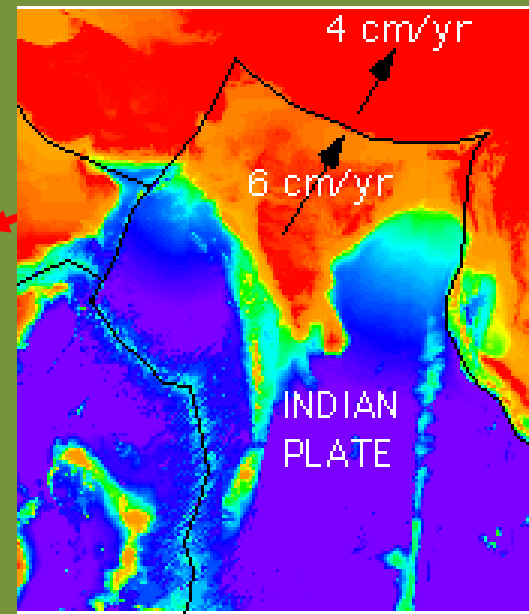
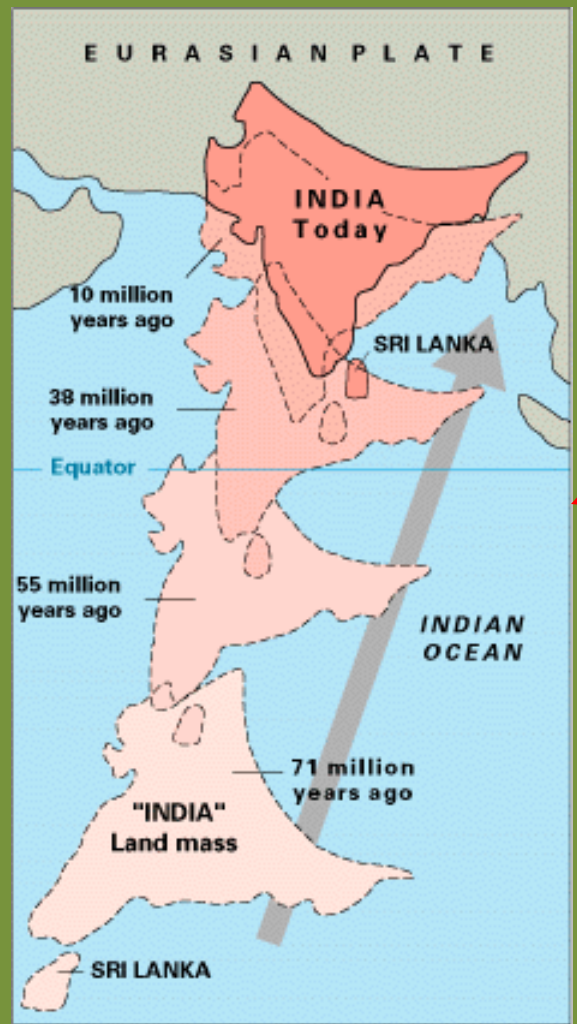
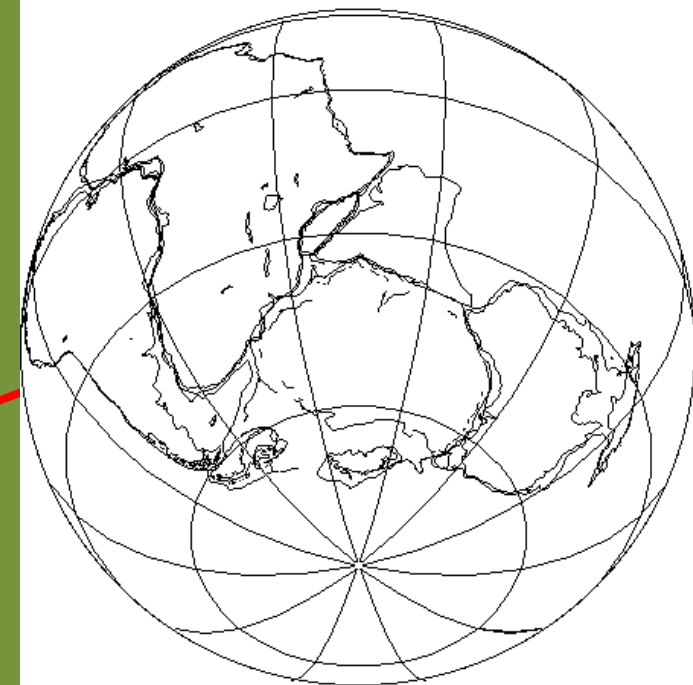
The 2011 AMRI Hospital fire was a major fire at a private hospital in Dhakuria, Kolkata, that occurred in the early morning of 9 December 2011. The hospital is part of a private hospital chain owned by the Emami & Sarachi group, known as AMRI Hospitals.

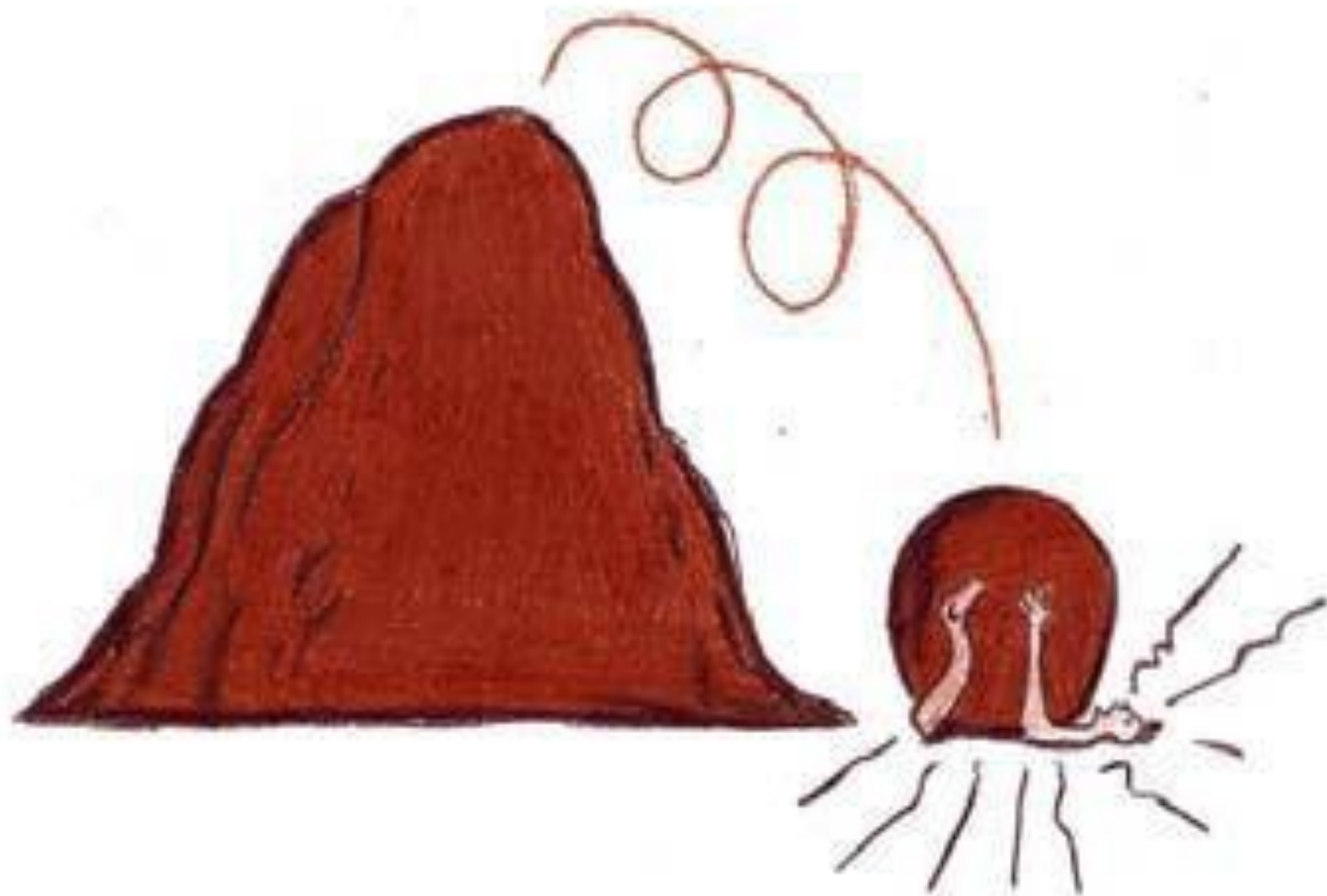
Date: 9 December 2011

Location: Dhakuria



Gondwanaland: 200 Ma





Disaster

WHAT IS.....

DEFINITION

“A Disaster (from Greek meaning) “bad” star is a natural or man made event that negatively effects life, property, livelihood often resulting in permanent changes to human society, ecosystem and environment.”

THE RELATIONSHIP BETWEEN DISASTERS AND DEVELOPMENT

DEVELOPMENT REALM

N

Development
can increase
vulnerability

Development
can reduce
vulnerability

P

Disaster can
set back
development

Disaster
can provide
development
opportunities

DISASTER REALM

According to the UN Office for Disaster Risk Reduction (UNISDR) **United Nations International Strategy for Disaster Reduction:** Economic losses due to natural hazards. Annually, these losses are estimated at over **\$306 billion.**

Indian Scenario

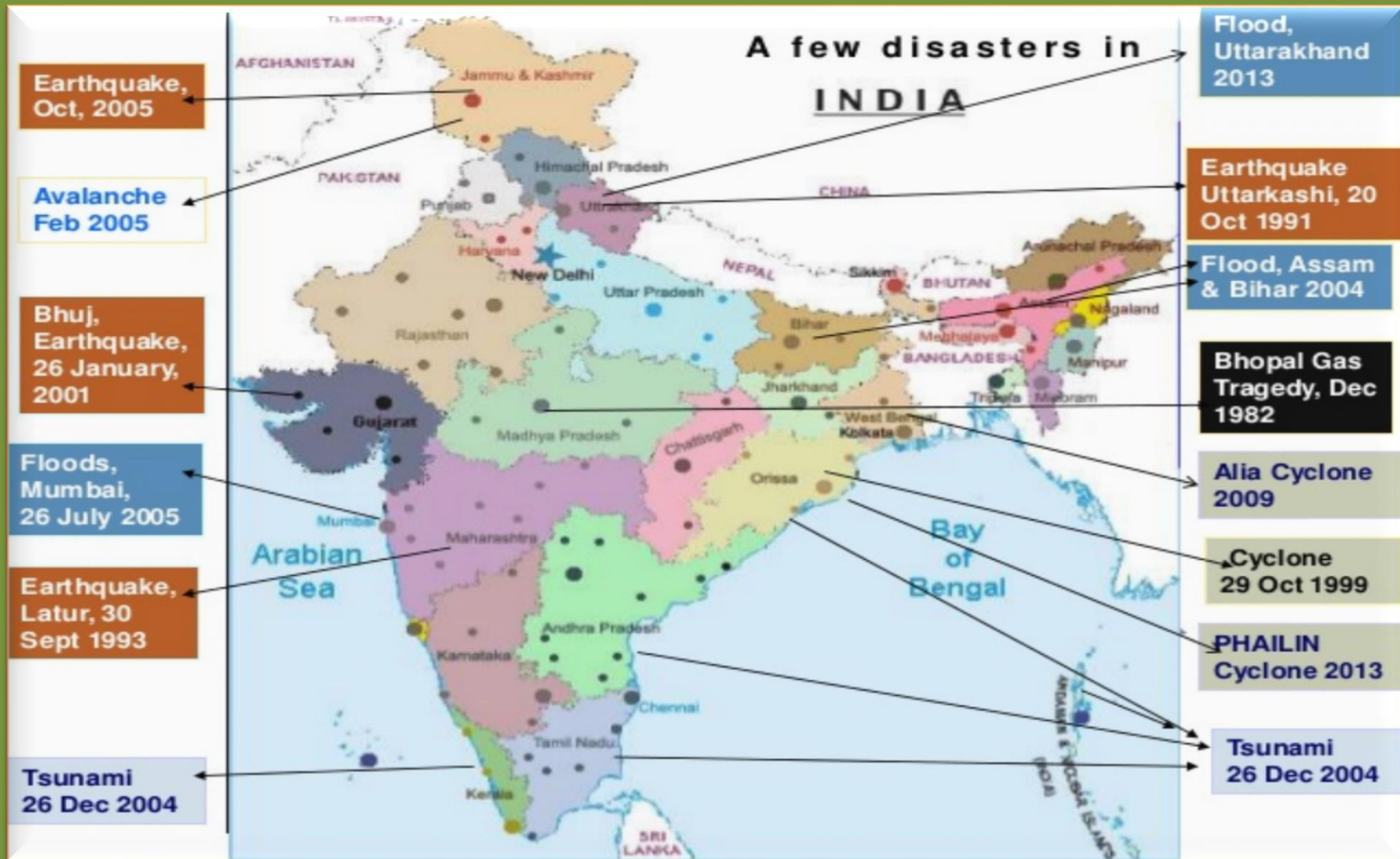
By the Global Assessment Report (UNISDR) estimates expected direct average annual losses for India at **\$10 billion per year**

India along with China is placed as top four countries (others include Japan, USA) as "high risk" in absolute economic exposure due to natural hazards

(Natural Hazards Risk Atlas 2014 by British Risk Assessors Maplecroft)

So we talk ??????????

India's Disaster Ridden History



The paradigm shift

- The focus of disaster management was earlier on :

Relief

Rehabilitation

Recovery

- Now the focus is shifting on to :

Prevention



Preparedness

Participation

Mitigation

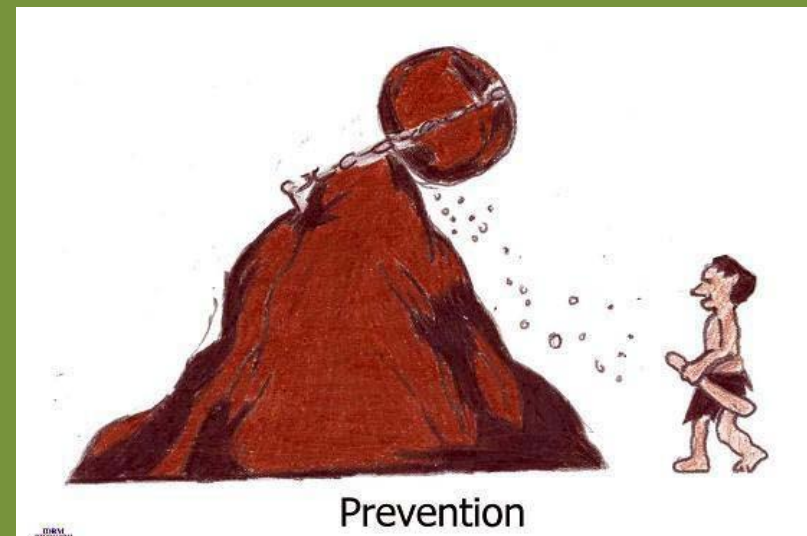


♦ **Disaster Risk Management:** The organization, planning and application of measures preparing for, responding to and recovering from disasters.

Prevention

Activities and measures to avoid existing and new disaster risks. While certain disaster risks cannot be eliminated, prevention aims at reducing vulnerability and exposure in such contexts where, as a result, the risk of disaster is removed.

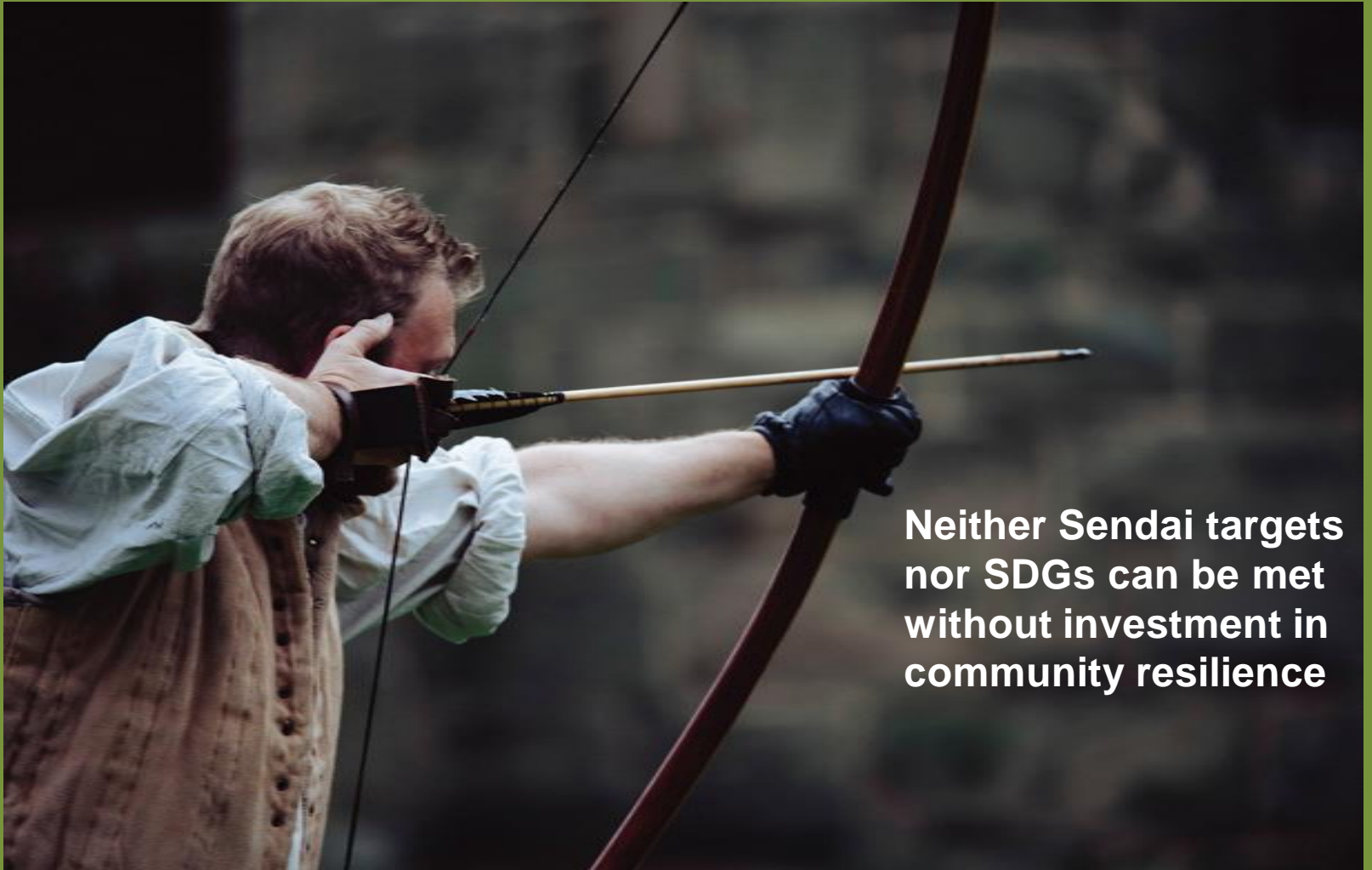
Examples include **dams or embankments that eliminate flood risks**



Global initiatives

- 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
 - ✓ Strengthen disaster preparedness for **effective response** at all levels.

First Sendai Conference held at Japan
on 12-14th March 2015, 187 countries
took part.



**Neither Sendai targets
nor SDGs can be met
without investment in
community resilience**

07 Global Targets

Reduce

1. Mortality

global population

2. Affected people/ global population

global population

3. Economic loss

4. Damage to critical infrastructure

& disruption of basic services



Increase

5. Countries with national
& local DRR strategies

6. International
cooperation

to developing countries



7. Availability and access
to multi-hazard early warning
systems & disaster risk
information and assessments



The Sendai Framework for Disaster Risk Reduction.mp4
Sendai Frame Work

**AMCDRR 2016, 03-05 November 2016 at Vigyan Bhawan,
New Delhi**

Venue: The AMCDRR 2016 organized at the Vigyan Bhawan, New Delhi.

Opening Ceremony: The Hon'ble Prime Minister of India Sri Narendra Modi inaugurated the AMCDRR 2016.

This conference was the first Asian Countries Conference on DRR, delegates from **51** countries participated in this conference.

PM's Ten-Point Agenda on DRR

1. Mainstreaming
2. Risk Coverage
3. Women's Leadership
4. Risk Mapping
5. Leverage Technology
6. Network of Universities
7. Effective Use of Social Media
8. Invest in Local Capacity
9. Post-Disaster Recovery
10. Coherent International Response



Institutional Framework

- **Disaster Management Structure**
 - NDMA - Apex Body with Prime Minister as Chairperson.
 - National Executive Committee
- **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
- **District Level** - DDMA headed by District Magistrate

National Disaster Response Force (NDRF)

- Contact Number: 011-26712851, 26161442
- [Email- Dg.ndrf@nic.in](mailto:Dg.ndrf@nic.in) ig.ndrf@nic.in
- 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.

Nodal Agencies for Disaster Management

- **Floods:** Ministry of Water Resources, CWC
- **Cyclones & Earthquakes:** Indian Meteorological Department
- **Epidemics:** Ministry of Health and Family Welfare
- **Flu:** Ministry of Health, Ministry of Environment, Ministry of Agriculture and Animal Husbandry
- **Chemical Disasters:** Ministry of Environment and Forests
- **Industrial Disasters:** Ministry of Labour
- **Air Accidents:** Ministry of Civil Aviation
- **Fire:** Ministry of Home Affairs
- **Nuclear Incidents:** Department of Atomic Energy

International Operations

Nepal Earthquake (April 2015)

On 25th April 2015, Nepal was rocked by a devastating Earthquake of magnitude 7.8, resulting in massive loss of lives and infrastructure and raised the fear of a humanitarian disaster across the Himalayan nation. The tremors were also felt across the areas in whole of Northern India.

National Disaster Response Force (NDRF) deployed its 16 USAR teams (03 teams of 08Bn, 04 teams of 07 Bn, 03 teams of 08 Bn, 03 teams of 02 B nand 03 teams of 09 Bn) comprising of more than 700 rescuers along with 18 dogs trained in USAR operation with latest gadgets at various earthquake hit areas of Nepal on the directions of the Government of India.



State Disaster Response Force (SDRF)

- Contact Number: 0135-2410293
- **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 DDRF.
 - Proactive Deployment during impending disaster situations.
 - Liaison, Rehearsals , awareness, capacity building Prgs. and Mock Drills.

Mock Drills

- Mock Exercises - 500 Conducted so far
 - >24 mock exercises on various natural and man-made disasters
 - Eight emergency management exercises (EMEx)



Satellite Phone Numbers

S. No.	District	Satellite Phone Numbers
1.	Almora	00873 7641 28651
2.	Nainital	00873 7641 28655
3.	Pithoragarh	00873 7641 28659
4.	Uttarkashi	00873 7641 28667
5.	Pauri Garhwal	00873 7641 28675
6.	Chamoli	00873 7641 28679
7.	Rudraprayag	00873 7641 28683
8.	Bageshwar	00873 7641 28687
9.	Tehri	00873 7641 28691
10.	Champawat (Provisional)	00873 76EB51 565F3B
11.	DMMC, Dehradun	00873 7641 28663
12.	DMMC, Dehradun	00873 7641 28671

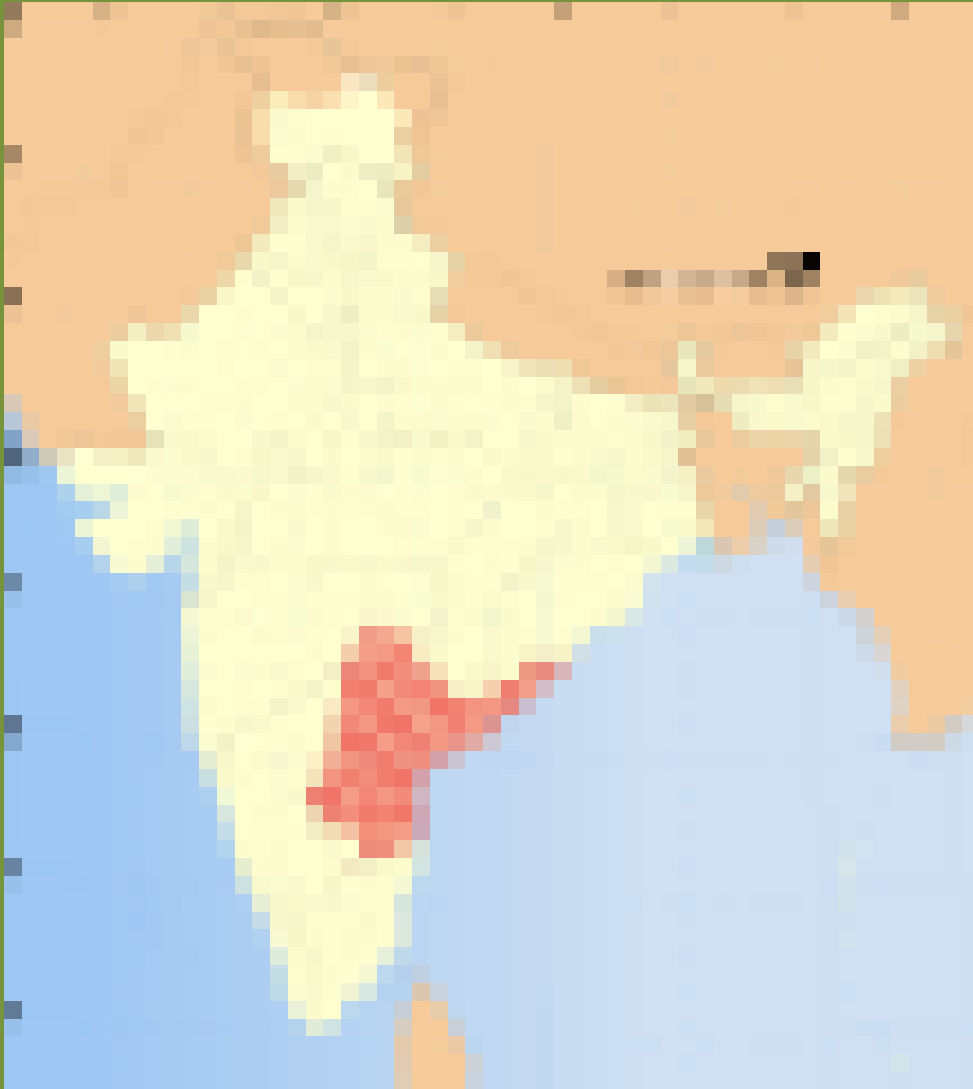
SOME DEADLIEST DISASTERS IN THE WORLD AND INDIA

SHAANXI EARTHQUAKE, 1556

On 14 February, 1556 an earthquake hit China. Some countries have up to 60% of their population killed. In all, more than 8,30,000 people died from the Shaanxi earthquake. The earthquake's magnitude was somewhere around 8.0



INDIA CYCLONE, 1839



Coringa is a tiny village of the [East Godavari district](#), in [Andhra Pradesh](#), [India](#). On 16 November, 1839 cyclone struck Coringa suffered great damage. over 3,00,000 people were died .

YELLOW RIVER FLOOD, 1887

The Yellow River, which is located in China, is extremely prone to flooding. In 1887, the Yellow River flooded and completely devastated about 50,000 square miles of land. The flood is said to have killed between 900,000-20,00,000 people.



HAIYUAN EARTHQUAKE, 1920

On 16 December, 1920 A 7.8 Mg.earthquake hit Ningxia, China. The earthquake also caused landslides and large ground cracks, especially close to the epicenter of the earthquake. The earthquake was so strong that some rivers became dammed and others changed courses. Most of the homes and buildings were destroyed. Over 2,00,000 people were killed.



CENTRAL CHINA FLOODS, 1931

Three different rivers Yangzta, Yellow, and Huai rivers. flooded-over, and up to 4 million people were killed because of the floods.

1 Million=10 LAKH



AP/WIDEWORLD
Photo by Neg. 1 August 1931



ON 6 AUGUST, 1945,

The Japanese city of Hiroshima was destroyed by a nuclear weapon, an atomic bomb dropped by the United States. Three days later, a second atomic bomb was dropped on the city of Nagasaki; five days after that, Japan unconditionally surrendered to the United States, bringing an end to World War II.



BHOLA CYCLONE, 1970

The Bhola Cyclone hit East Pakistan, now known as Bangladesh. On 12 November, 1970, up to 5,00,000 people were killed because of the heavy rain and flooding in many areas.



TANGSHAN EARTHQUAKE, 1976

At 3:42 a.m. on 28 July, 1976, a magnitude 7.8 earthquake hit the sleeping city of Tangshan, in north eastern China, and killed over 2,40,000 people



BHOPAL GAS TRAGEDY 1984 (PABLO BARTHOLOMEW)



Casualties were near about **15,000** Persons. Because safety standards and maintenance procedures had been ignored at the Union Carbide India Limited (**UCIL**) pesticide plant in Bhopal, a leak of **Methyl Isocyanides Gas** and other chemicals triggered a massive environmental and human disaster. A man who was burying a child.

INDIAN OCEAN EARTHQUAKE/TSUNAMI, 2004

On 26 December, 2004, a day after Christmas, and undersea earthquake struck, with its epicenter off the coast of Sumatra, Indonesia. Through the earthquake hit many different places, it was most felt in India, Sri Lanka, Indonesia, and Thailand. This is the second largest earthquake recorded the casualties were **2,30,000**, a magnitude was 9.1-9.3.



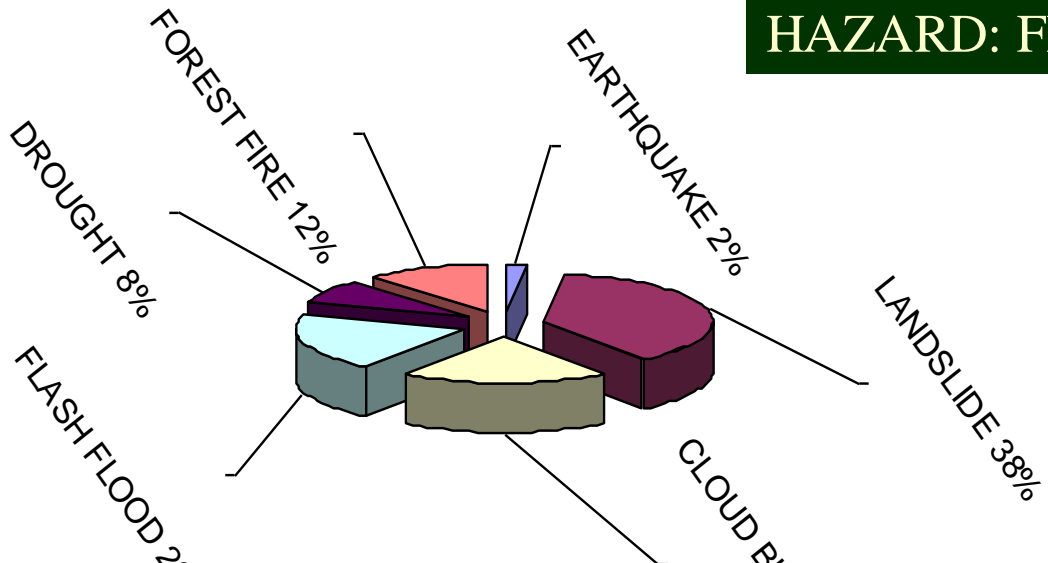
Himalaya Prone to Natural Disasters



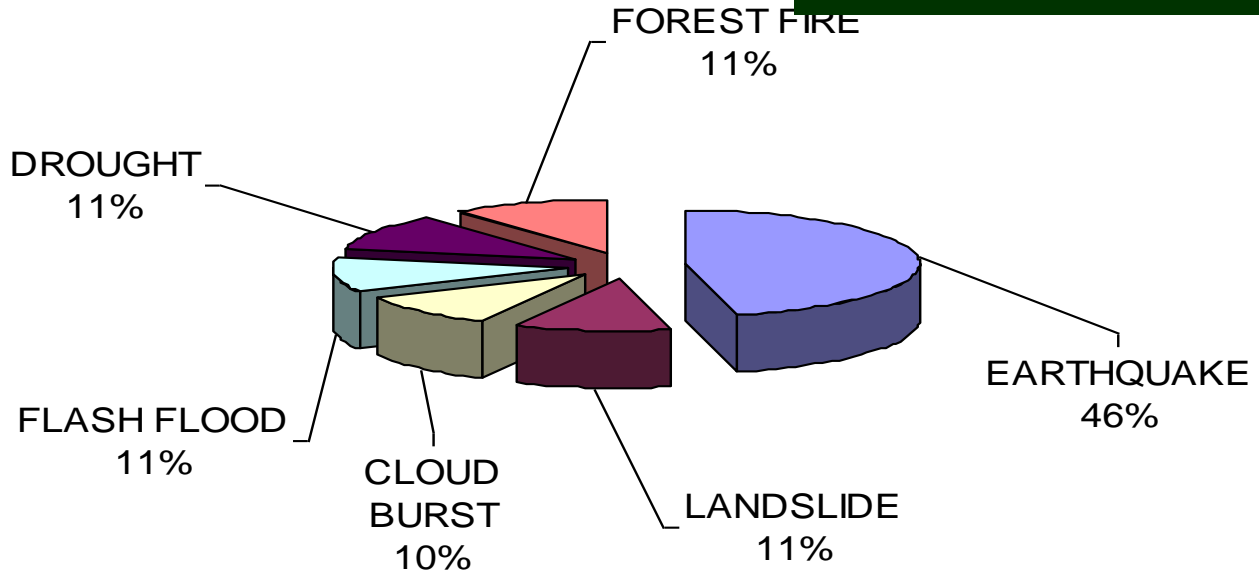
HAZARD VULNERABILITY AND RISK ANALYSIS

A PROFILE OF HAZARDS IN UTTARAKHAND

HAZARD: FREQUENCY



HAZARD: SEVERITY



Uttarakhand

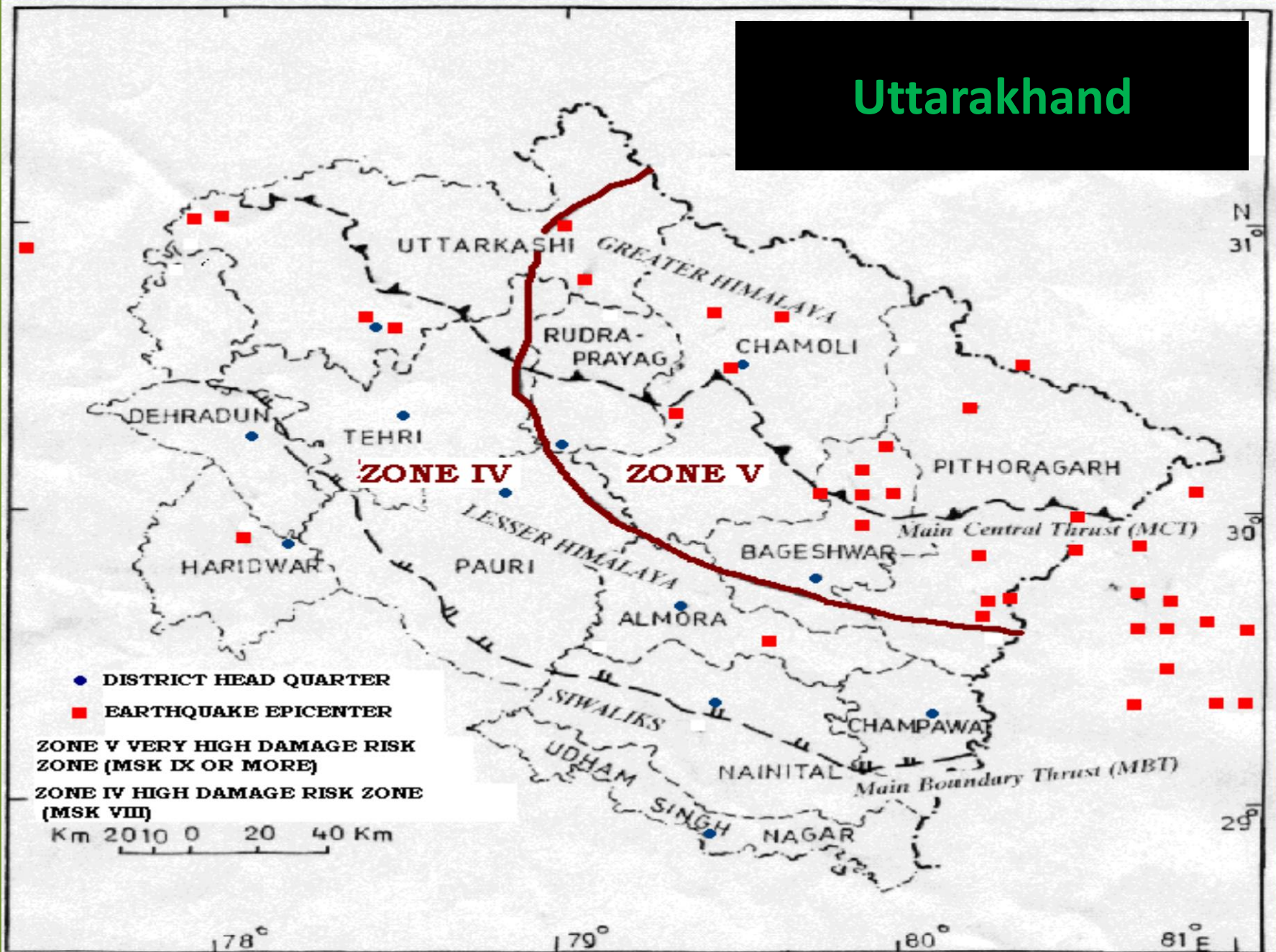
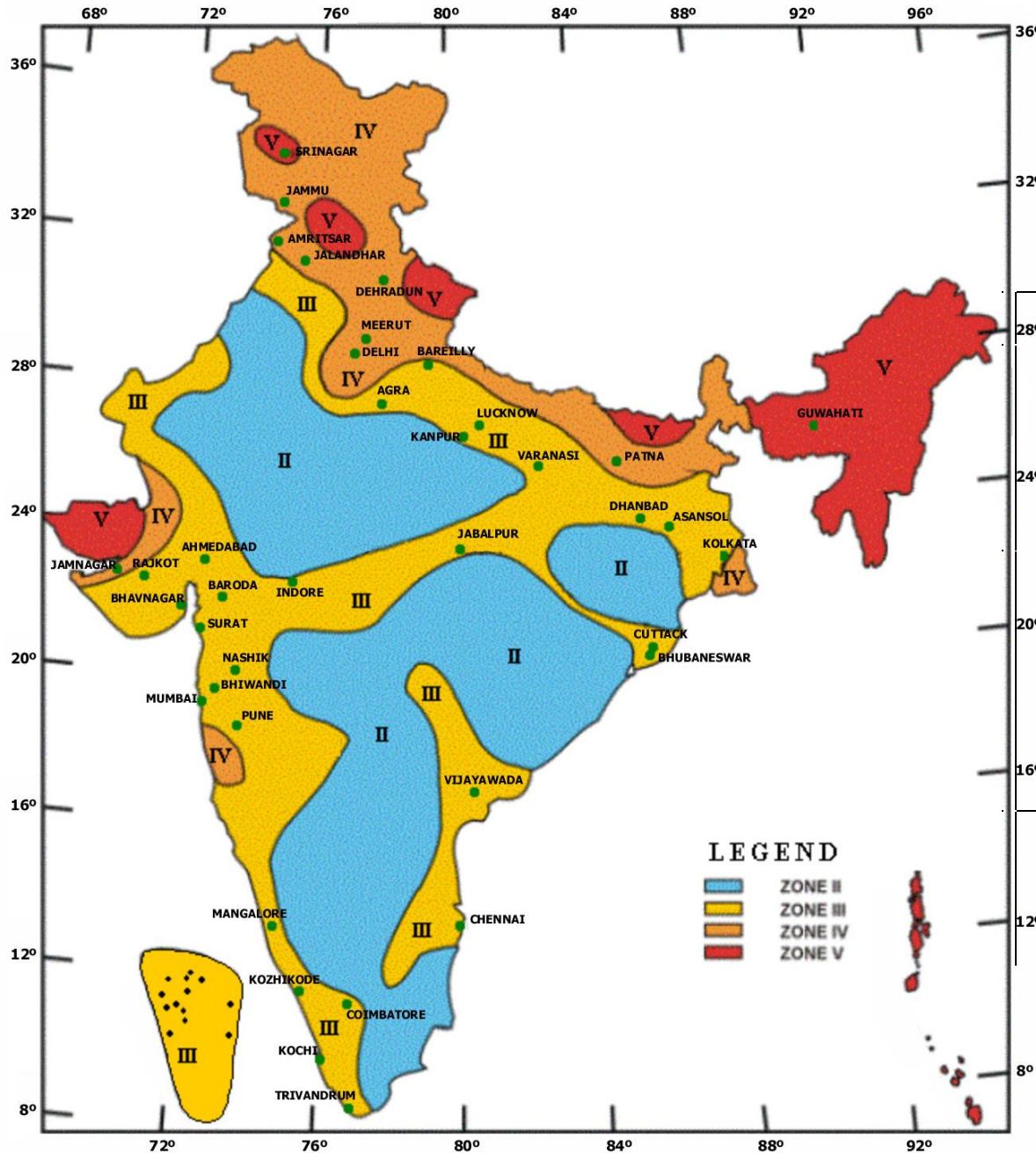


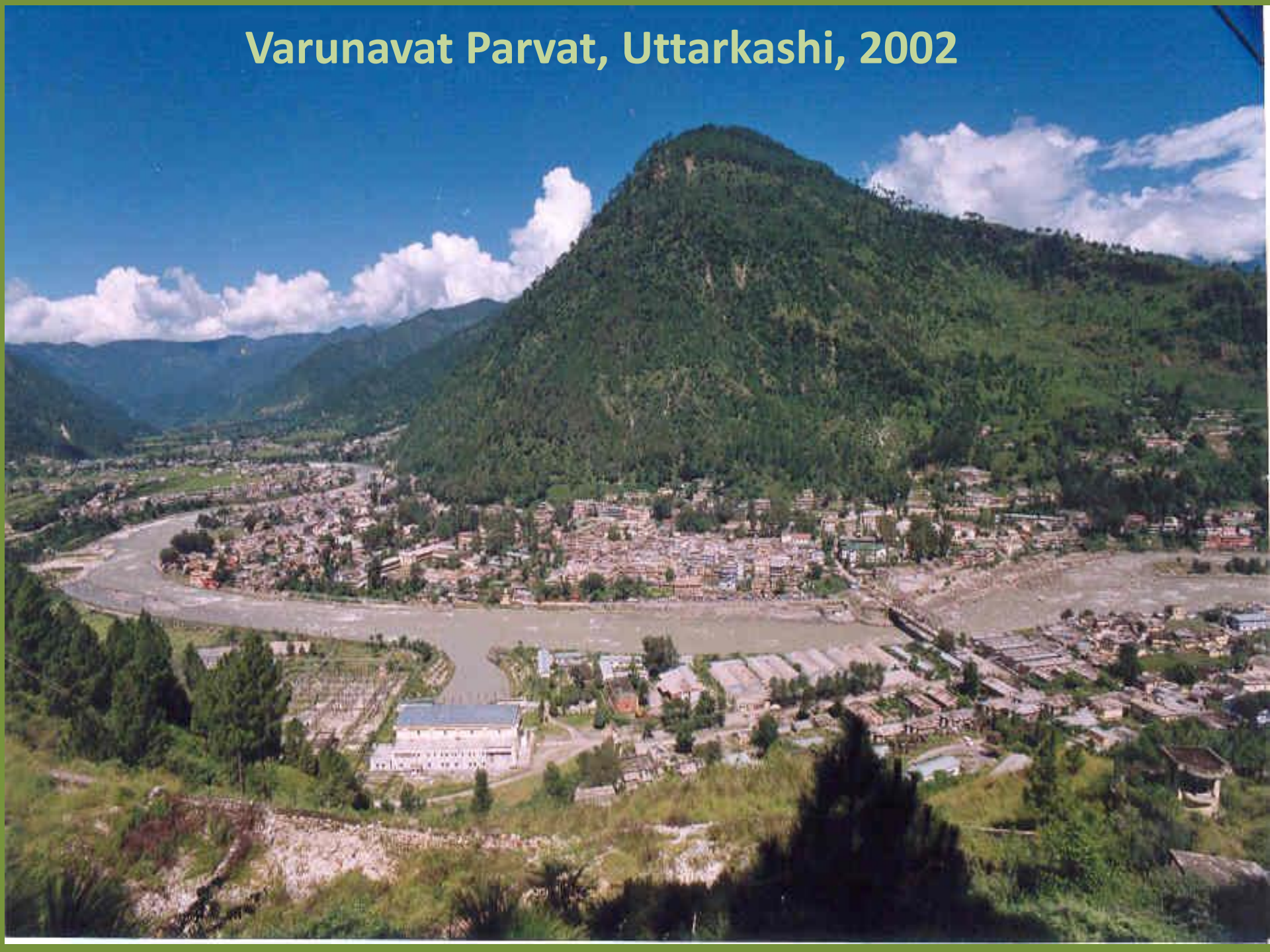
Fig: 2.1.6



Zone	Magnitude
Zone V	Very High Risk Quakes of Magnitude 8 and greater
Zone IV	High Risk Quakes upto Magnitude 7.9
Zone III	Moderate Risk Quakes upto Magnitude 6.9
Zone II	Seismic Disturbances upto Magnitude 4.9

Hazards Exposure in Uttarakhand

Varunavat Parvat, Uttarkashi, 2002



Section 2

HAZARDS

UNAVOIDABLE PART OF OUR LIFE

What is

Hazard

- A process, phenomenon or activity that may cause loss of life, injury or other health impacts, property damage, social and economic disruption or environmental degradation. Hazards may be natural, anthropogenic or socio natural in origin.

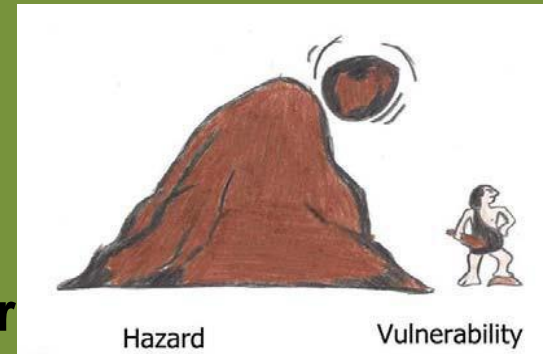
Vulnerability - Exposure of loss of life

Risk

- The probability of disaster happening.

Capability

- Capability is the sources of individuals, households, and community or resists the impact of disasters.



RISK



SOURCE: Mr. RS RANA DDMO, Pithoragarh

THE GOLDEN RULE OF MATHEMATICS
IF ANY THING MULTIPLIED BY ZERO
RESULT WILL BE ZERO. SO TO MAKE
RISK ZERO

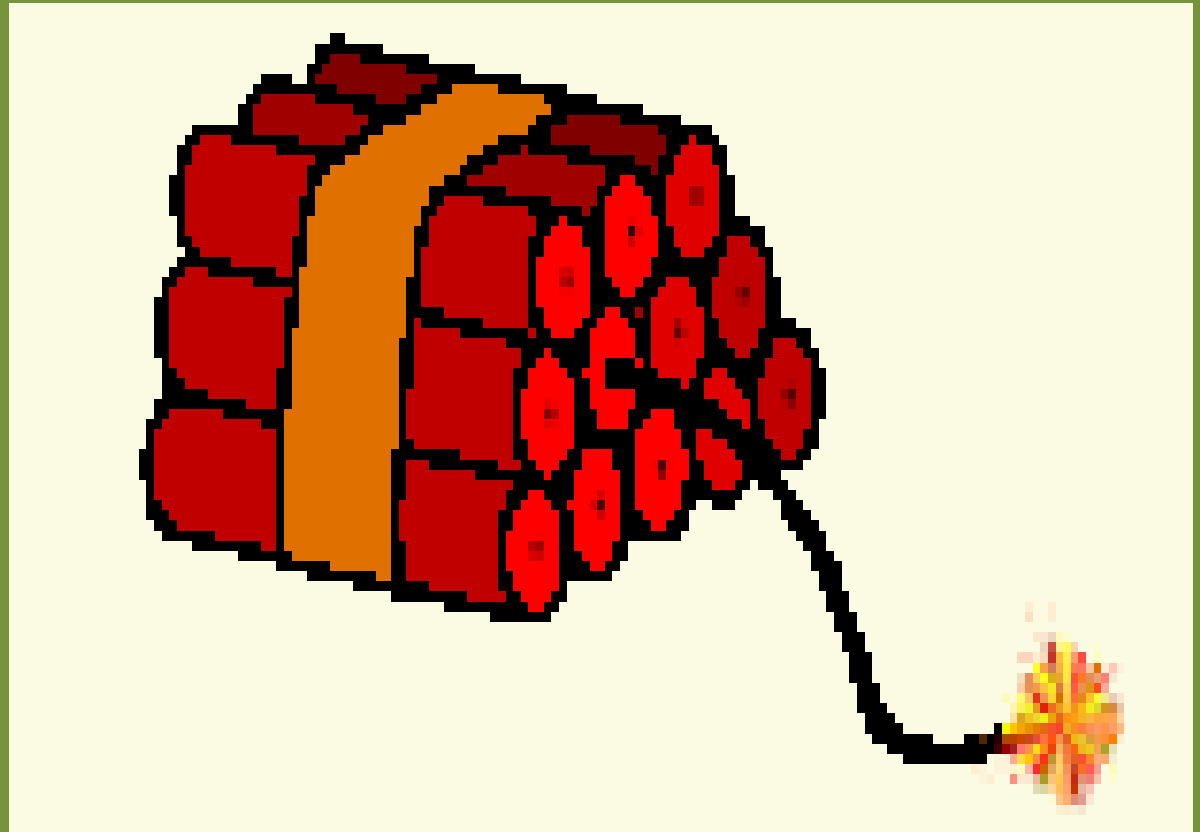
$$\text{RISK} = \frac{\text{HAZARD} \times \text{VULNERABILITY}}{\text{Manageability}}$$

Section 3

EARTHQUAKE



EARTHQUAKE



Most destroyer event

Impact of Earthquake: 26 December 2004



11 September 2021
Chamoli earthquake

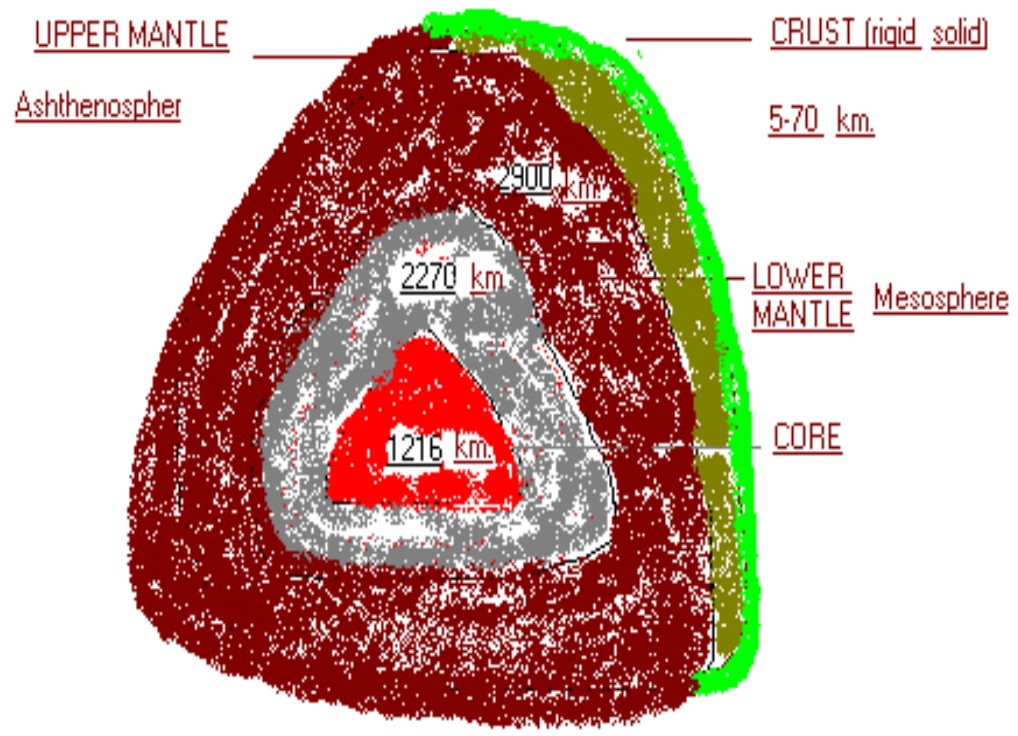
DEFINITION

An earthquake is a series of vibrations on the earth's surface caused by the generation of elastic (seismic) waves due to sudden rupture within the earth during release of accumulated strain energy.

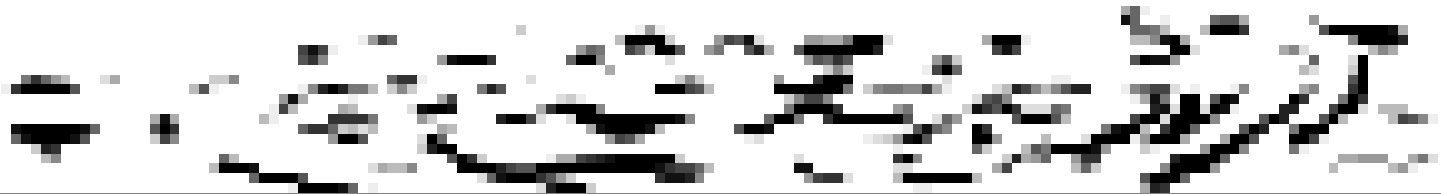
Causes

: **Non-Tectonic**

: **Tectonic**

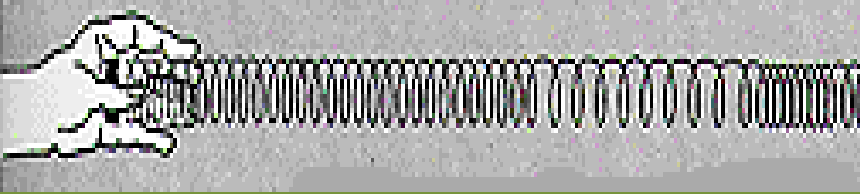


तरंगें (WAVES)

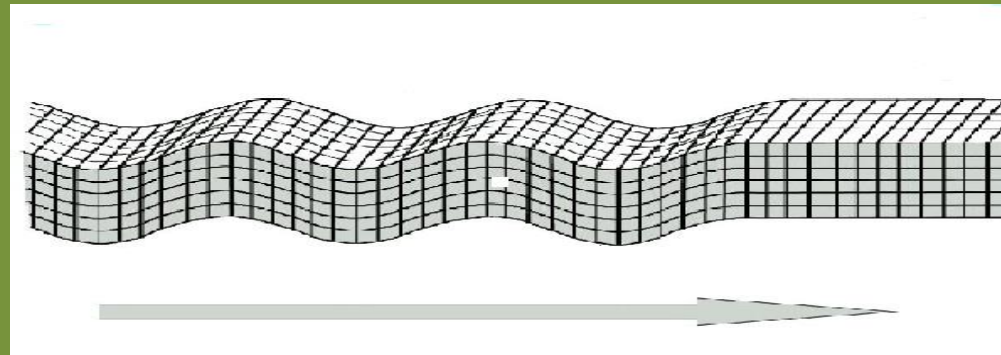


BODY WAVES

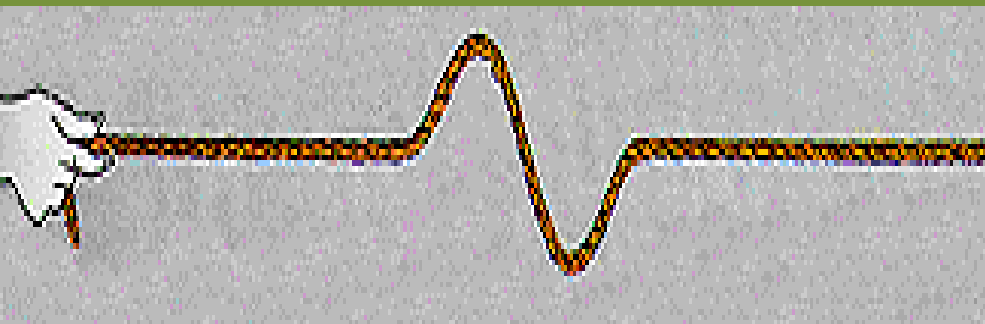
SURFACE WAVES



P-WAVE



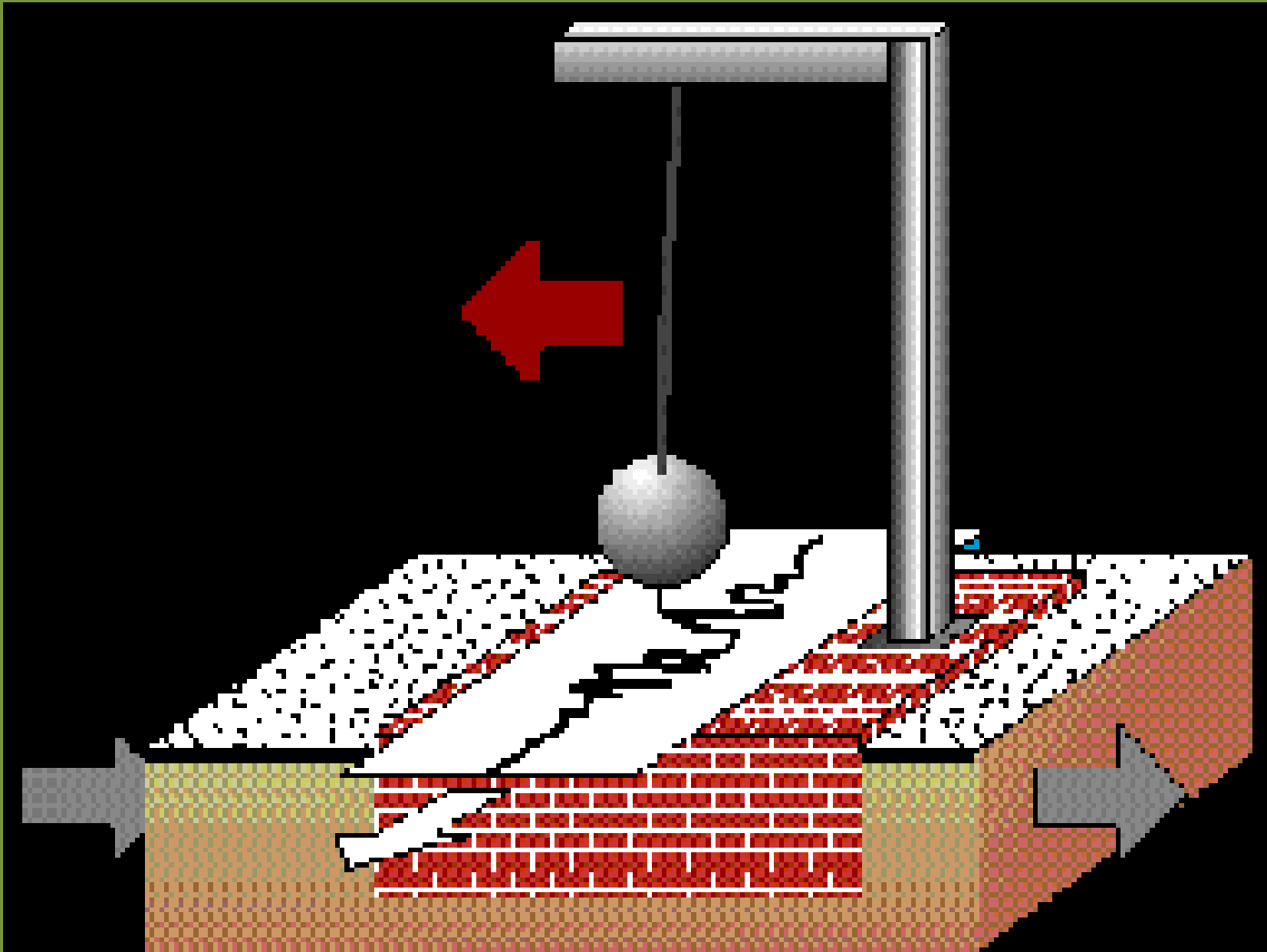
S-WAVE

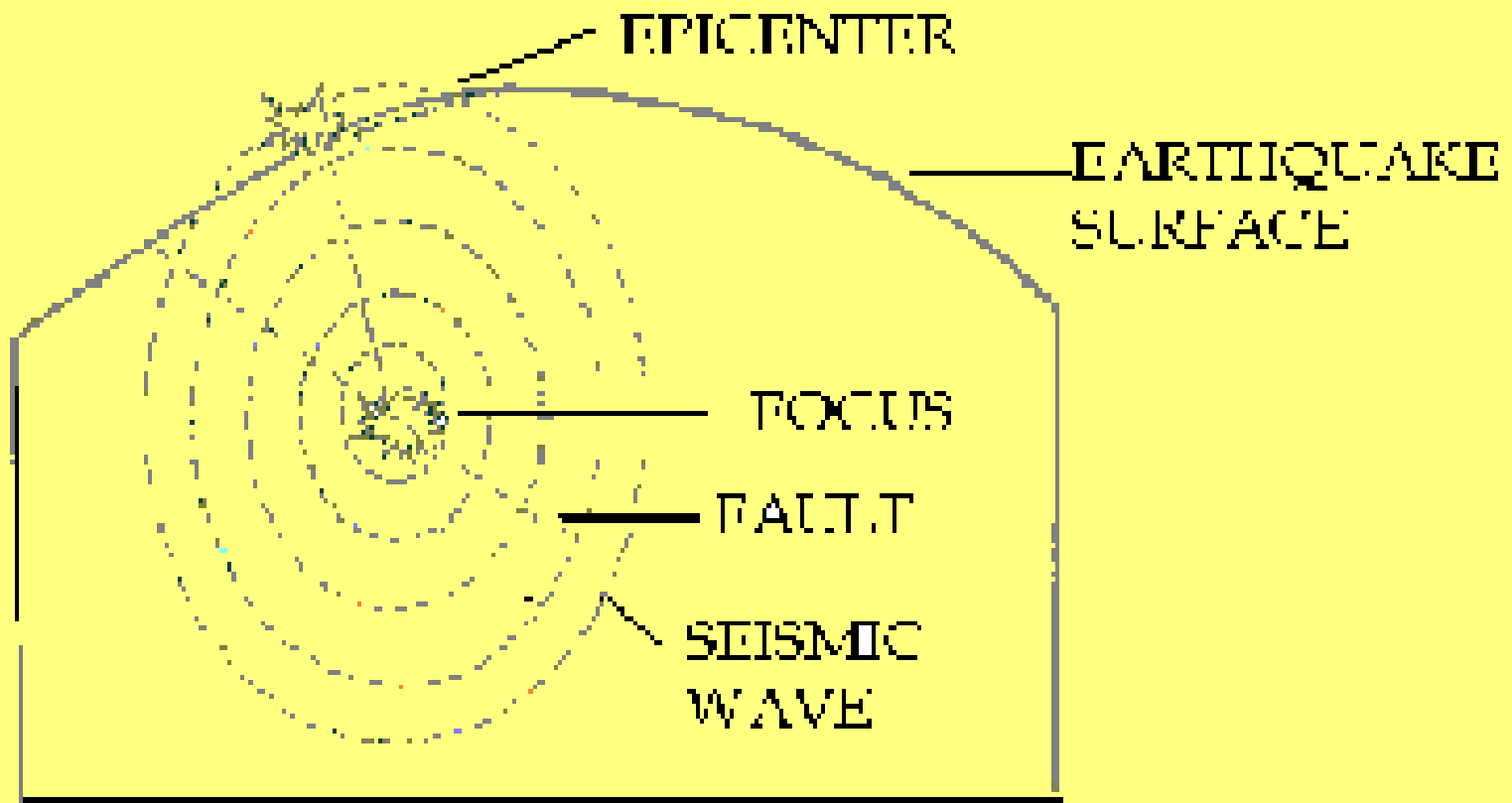


लव (LOVE)- तरंग

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SEISMOGRAPH





CLASSIFICATION OF EARTHQUAKES:

**Slight - Magnitude up to 4.9
on the Richter scale**

Moderate - Magnitude 5.0 to 6.9

Great - Magnitude 7.0-7.9

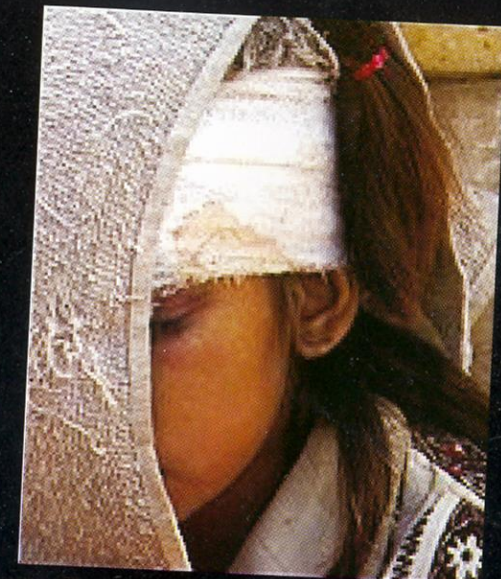
Very Great - Magnitude 8.0 and more

WORST EARTHQUAKES

4 अप्रैल 1905	कागड़ा, भारत	8.2	30,000
28 दिसम्बर 1908	मेसिना, इटली	7.5	1,00,000
16 दिसम्बर 1920	गानूस, चीन	8.6	2,00,000
1 सितम्बर 1923	क्वान्टो, जापान	7.3	1,10,000
22 मई 1927	जिनिंग, चीन	8.3	2,00,000
15 जनवरी 1934	भारत, नेपाल, सीमा	8.4	10,700
30 मई 1935	क्वेटा, पाकिस्तान	7.5	50,000
5 अक्टूबर 1948	तुर्कमेनिस्तान, रूस	7.3	1,10,000

15 अगस्त 1950	आसाम,भारत	8.7	1,530
22 मई 1960	चिली	9.5	6,000
31 मई 1970	पेरू	7.8	66,000
27 जुलाई 1976	तॉंगशान,चीन	8.0	2,55,000
20 अगस्त 1988	भारत–नेपाल	6.6	1,450
20 जून 1990	पश्चिमी इरान	7.7	50,000
20 अक्टूबर 1991	उत्तरकाशी भारत	6.6	768
30 Sept.1993	LATUR EARTHQUAKE	7.4	20,000
26 जनवरी 2001	भुज, भारत	7.7	20,023
26 Dec. 2003	S.Eran	6.5	43,200
26 De.2004	Anman Nikobar	9.1-9.3	2,30,000
8 October,2005	Pakistan	7.6	75,000
12 January,2010	Haiti (United State)	7.0	3,16,000
07 April,2011	Japan	9.0	15,870 (Japanee National Police Agency)

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Manta Ramveer, aged 10, recovers from her injuries after her school collapsed

971 students and 31 teachers died in the 2001 Bhuj Earthquake.

1884 school buildings collapsed.

Loss of 5950 classrooms.

11761 school buildings suffered major to minor damages

Additional 36584 rooms unfit and holding classes.

300 children marching in the Republic Day Procession in the narrow lanes were killed when building collapsed into the narrow street from both the sides.

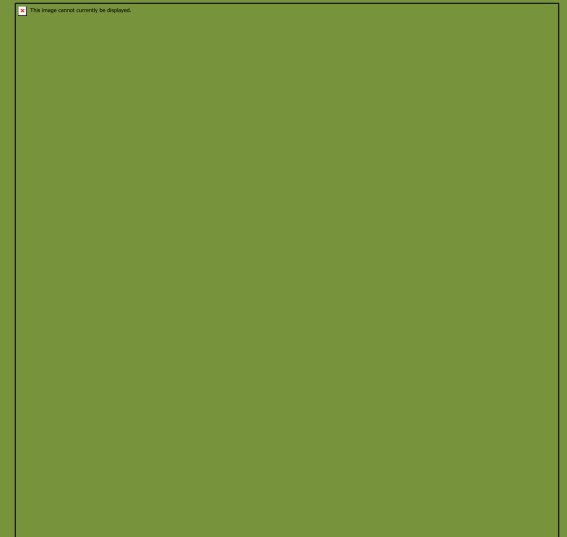


23 December 1995, nearly 425 people many of them school children perished as they tried to escape the flames during a school prize giving ceremony in the town of Dabwali, Haryana.

Kumbakonam fire tragedy

A deadly fire raged through Lord Krishna School.

Killed 93 children, all below the age of 11 years.



Section 4

Earthquake Resistant Construction

Traditional Houses in a Village of Uttarkashi





18/05/2007

Impact Of Earthquake

SEISMICALLY INDUCED LANDSLIDE AFTER CHAMOLI EARTHQUAKE, 1999



**STRATEGY
FOR
DISASTER RISK REDUCTION**

STRATEGIES FOR DISASTER MANAGEMENT

1. Change of Focus from **Relief Centric to Holistic Approach.**
2. Mainstreaming Disaster Management into **all National Developmental Programmes.**
3. Empowerment of the Community to face the Disaster.
4. Emphasis on Training, Development of Human Capital and **Capacity Building.**
5. Key Role of **Educational and Professional Institutions** for Mass Education and Awareness.
6. **Upgradation of the Key Responders.**

STRATEGIES FOR DISASTER MANAGEMENT

7. Supporting and Enabling **Mechanisms for the Districts and States.**
8. Failsafe **Early Warning & Communication Systems.**
9. **Coordinated**, Timely and Effective Response.
10. Involvement of **NGOs & Corporate** Sectors.
11. Time Bound Action Plan for
12. Pro-active Participation at the Regional and International Level.
13. Hospital Disaster Management Plan
14. Urban disaster risk reduction plan
15. Make cities of India disaster resilient

NPDRR “Disaster Risk Reduction for sustainable development: Making India resilient by 2030” from 15th to 16th May, 2017 at Vigyan Bhawan, New Delhi. This meeting organized by National Disaster Management Authority (NDMA), New Delhi.

Outcome points of the meeting are following:

- **It was recommended to increase intuitional capacities of University, Engineering Colleges & Polytechnic by adding Disaster Management in the curriculum.**
- **A state level facility to be created for maintaining and managing the data with regards to Disaster Management.**
- **Micro-zoning and high risk vulnerability atlas is to be created at Taluka/District/State level.**
- **Community based Disaster risk training to be provided specially at Gram Panchayat level.**

- Insurance policy should be made compulsory for every citizen of the State.
- Resource mapping should be done at District level.
- Training for Masons should be compulsory.
- Building codes should be made compulsory at all level.
- Early Warning Fore Casting System (EWFS) should be implemented at all levels
- Hundred percent training for PRD & Home Guards on Disaster response.

Challenges

- Building in disaster risk reduction measures within mainstream development initiatives.
- Developing required capacity to assess risk, plan, prepare and manage disasters at various levels.
- Creating a culture of safety as a concern, specially among the communities at risk

Greater Involvement and Leadership of Women in Disaster Risk Management



Thank You

