

Unit II
DEALING WITH
ENVIRONMENTAL CONCERNS

SYLLABUS AT A GLANCE:-

❖ UNIT-II-DEALING WITH ENVIRONMENTAL CONCERNS

- Concept & Impact/Effects of Disaster-
Physical, Psychological, Economic, Social
- Locally relevant case studies of Environmental Disaster
- Dealing with Disasters:-Factors to be considered for Prevention,
Mitigation(Relief & Rehabilitation)& Disaster Preparedness
- Human Issues in addressing Disasters-Issues related to Compensation &
Distribution of Relief, Humanitarian Approach to Resettlement &
Rehabilitation

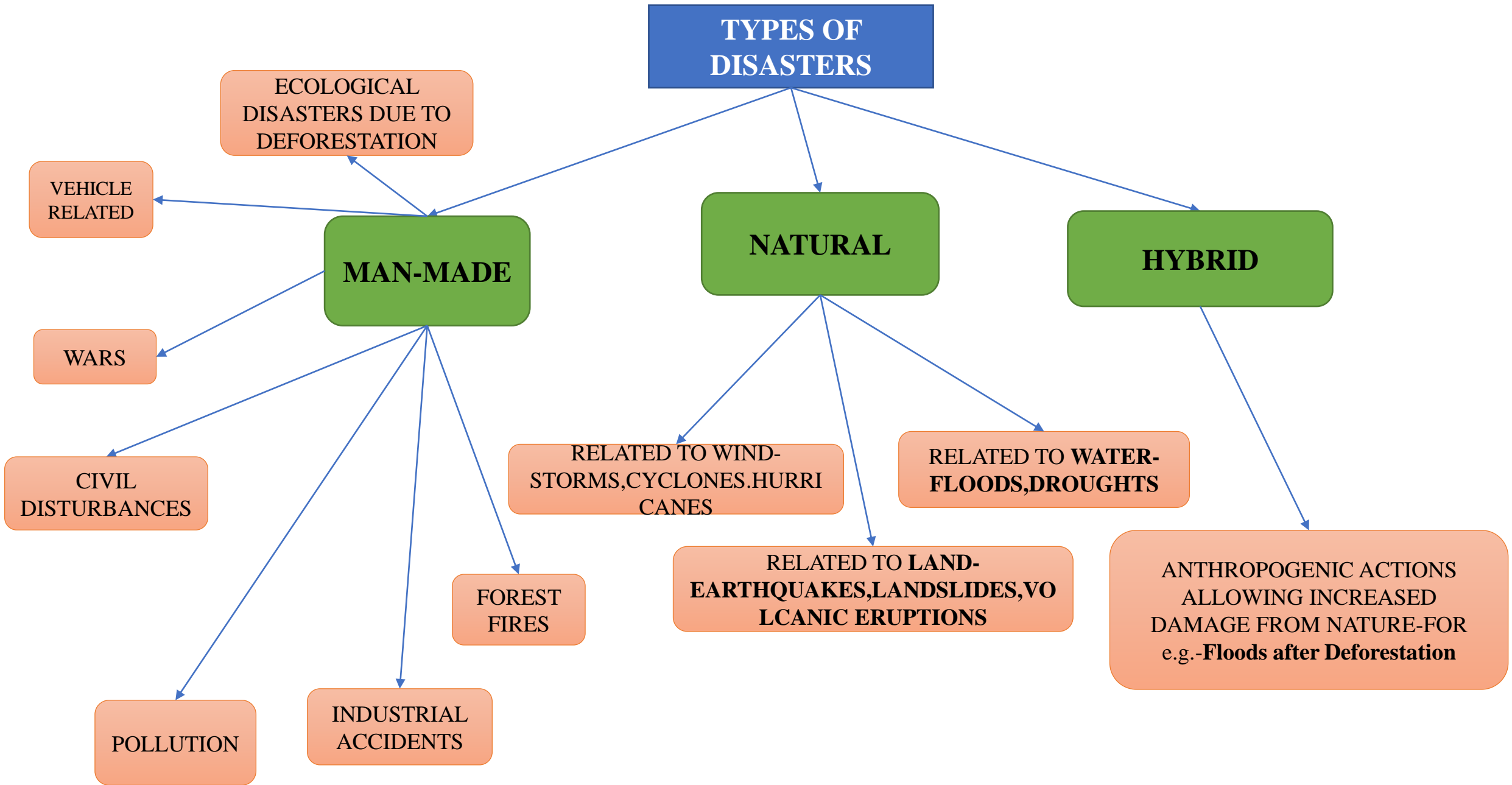


Concept and types of disasters

❖ CONCEPT OF DISASTER :-

▪ DEFINITIONS :-

1. According to **Webster's Dictionary**, Disaster is- “A grave occurrence having ruinous (Destructive) Results”.
2. According to **WHO (World Health Organisation)** Disaster is- “Any event concentrated in time & space in which a society or a relatively self-sufficient sub-division of a society, undergoes severe danger and incurs such losses to its members and physical objects, so that the social structure gets disrupted & fulfilment of all or some of the essential functions of society gets prevented.”



TYPES OF DISASTERS

ECOLOGICAL DISASTERS DUE TO DEFORESTATION

VEHICLE RELATED

MAN-MADE

NATURAL

HYBRID

WARS

CIVIL DISTURBANCES

RELATED TO WIND-STORMS, CYCLONES, HURRICANES

RELATED TO WATER-FLOODS, DROUGHTS

POLLUTION

INDUSTRIAL ACCIDENTS

FOREST FIRES

RELATED TO LAND-EARTHQUAKES, LANDSLIDES, VOLCANIC ERUPTIONS

ANTHROPOGENIC ACTIONS ALLOWING INCREASED DAMAGE FROM NATURE-FOR e.g.-Floods after Deforestation



AVALANCHE



CYCLONE



DROUGHT



FLOODS

EXAMPLES OF DISASTERS



DEFORESTATION



FOREST FIRES



TSUNAMI



EARTHQUAKE

OIL SPILLS



HURRICANES



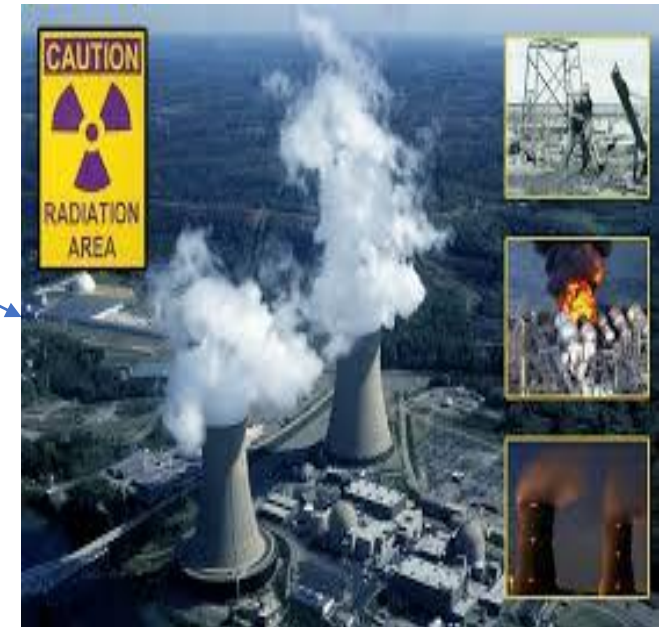
INDUSTRIAL ACCIDENTS



EXAMPLES OF DISASTERS



VOLCANIC ERUPTIONS



NUCLEAR ACCIDENTS

❖ CHARACTERISTICS OF DISASTERS :-

- 1. Borderless :-** Disasters do not follow boundaries of continents or nations. At a time, they can occur over a large amount of area.
 - For e.g. Tsunami of 26th December 2004 devastated shores of **India, Indonesia, Sri-Lanka, Thailand, Bangladesh, Malaysia, Maldives, Madagascar and so on.**
- 2. Severe loss :-** It kills not only humans but also leads to tremendous loss of Property, Houses, Land, Livestock, Offices, Factories etc.
 - 26th December 2004 Tsunami took away lives of almost **2.3 lakh** people across **14 nations.**
- 3. Unusual Events :-** Disaster can occur at any time. Within fraction of seconds, they just destroy almost everything present around.



26th December 2004-Tsunami



4. **Communication Failure:-** Modes of communication fail to operate thus adding hurdles in transfer of vital information.
 - For e.g. Mobile Network & Landline telephone connection failure, Electricity failure, Incorrect information in the form of **rumours**, **Misunderstandings** due to panic created by occurrence of disaster.
5. **Uncertainties :-** In Disaster, it is challenging to know, understand the extent of damage.
6. **Situation may get worse or better :-** Disasters are unusual, unpredictable many times. Their extremity varies with time. Therefore situations before & after the disaster can be totally different than actual disaster.
7. **Time consuming Recovery Process :-** Many people think that post disaster situation will come back to normal within weeks or days. But sometimes it takes months or years. One cannot always expect a quick recovery.

8. **Failure of emergency services** :- Fire halls & Fire trucks get damaged & crushed, making impossible for fire extinguishers to bring the situation under control, as water pipes break. Hospitals get over flooded with patients. Sometimes hospital buildings also collapse making people impossible to get in or out.

Fire-Brigade



Crowded & Damaged Hospitals



❖ Impacts of Disasters

Physical

Tremendous no. of Deaths

Irreparable Injuries

Outbreak of Diseases

Waterborne

Crowd Born

Vector Borne

Malnutrition

Psychological

Post-Traumatic Stress Disorder

Stress Symptoms

Physiological

Psychological

Behavioural

Social

Caste & Communal Disturbances

Cast & Communal Discrimination

Problem of Social Networking/Connectivity

Adverse effects on Women

Problem of Social Evils

Problems of Social Tribes

Economical

Economical Loss Due to

Unemployment

Loss of Assets

Physical Injury Treatment

Death of earning family member/Sole Bread Earner

Physical Impacts of Disaster :-

- i) **Deaths** :- Disasters result into death of large number of human beings.
 - For e.g. in **Indian Ocean Tsunami** of 26th December 2004, there occurred death of **2.3 lakh people** overall across 14 countries, including India.
 - In India alone, death of **10,000** people took place.
 - Highest number of occurred in **Indonesia** with a death toll of more than **40,000**.

- ii) **Physical Injury** :- Physical injury leads to extreme mental suffering, trauma. It may take years to recover from injury or the injury can be irrecoverable in the form of **permanent blindness, deafness or loss of limbs**.

- iii) **Outbreak of Diseases** :- Disasters leads to massive spread of diseases.
 - a) **Waterborne Diseases** :- Disasters like floods lead to contamination of potable water resources.

This water may contain several harmful pathogens & excreta of rodents. This causes stomach disorders **like- Cholera, Diarrhoea, Leptospirosis & Jaundice.**

- b) **Diseases associated with overcrowding** :- As young children have very limited immunity, overcrowding in relief camps can make them quickly catch infection. Some diseases associated with overcrowding are **Measles & Acute respiratory Problems.**
- c) **Vector-borne diseases**:- Vectors are organisms that carry pathogens & transfer from one person to another.
- Vector borne diseases are transmitted by insect or animal bites, most commonly by mosquitoes. In floods like disasters due to accumulation of water, mosquito breeding takes place on larger scale & dreadful diseases like- **Dengue, Chickengunya & Malaria spread.**

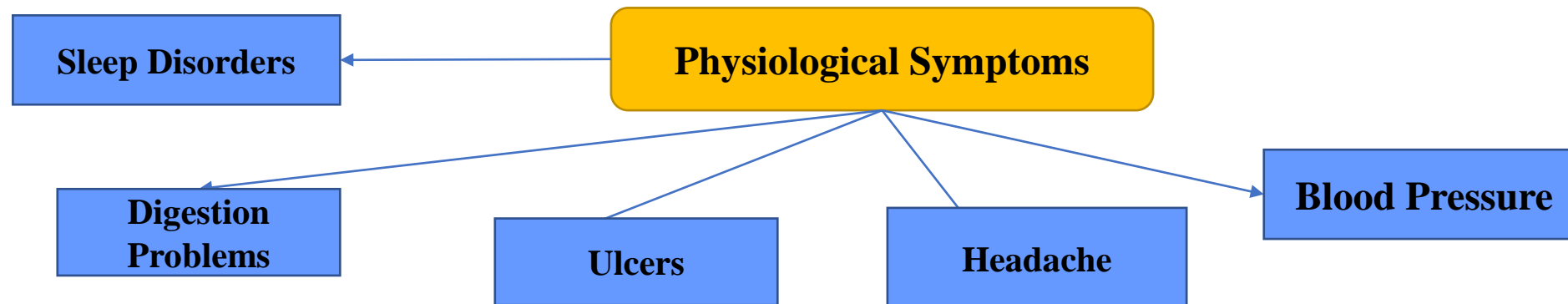
d) **Malnutrition Diseases** :-As disasters destroy agricultural land ,forest & lead to water shortage, food supply gets severely affected.

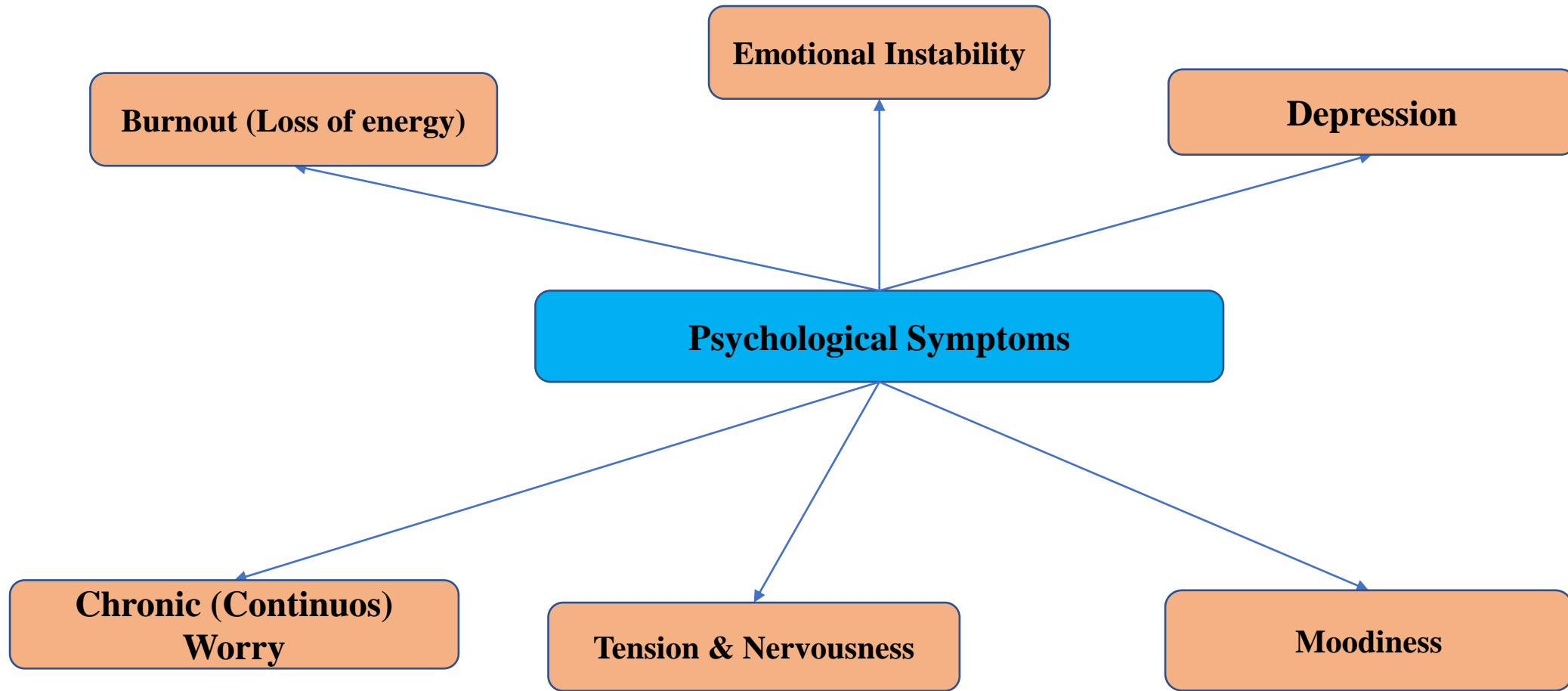
- Some Diseases caused by Malnutrition are **Marasmus, Anaemia, Kwashiorkor.**
- Also, Tribal people suffer as their source of livelihood depends on forest.
- They use herbal, traditional home remedies for several health ailments. But occurrence of disaster leads to loss of herbal plant wealth making them unable to get appropriate remedy for health complications.

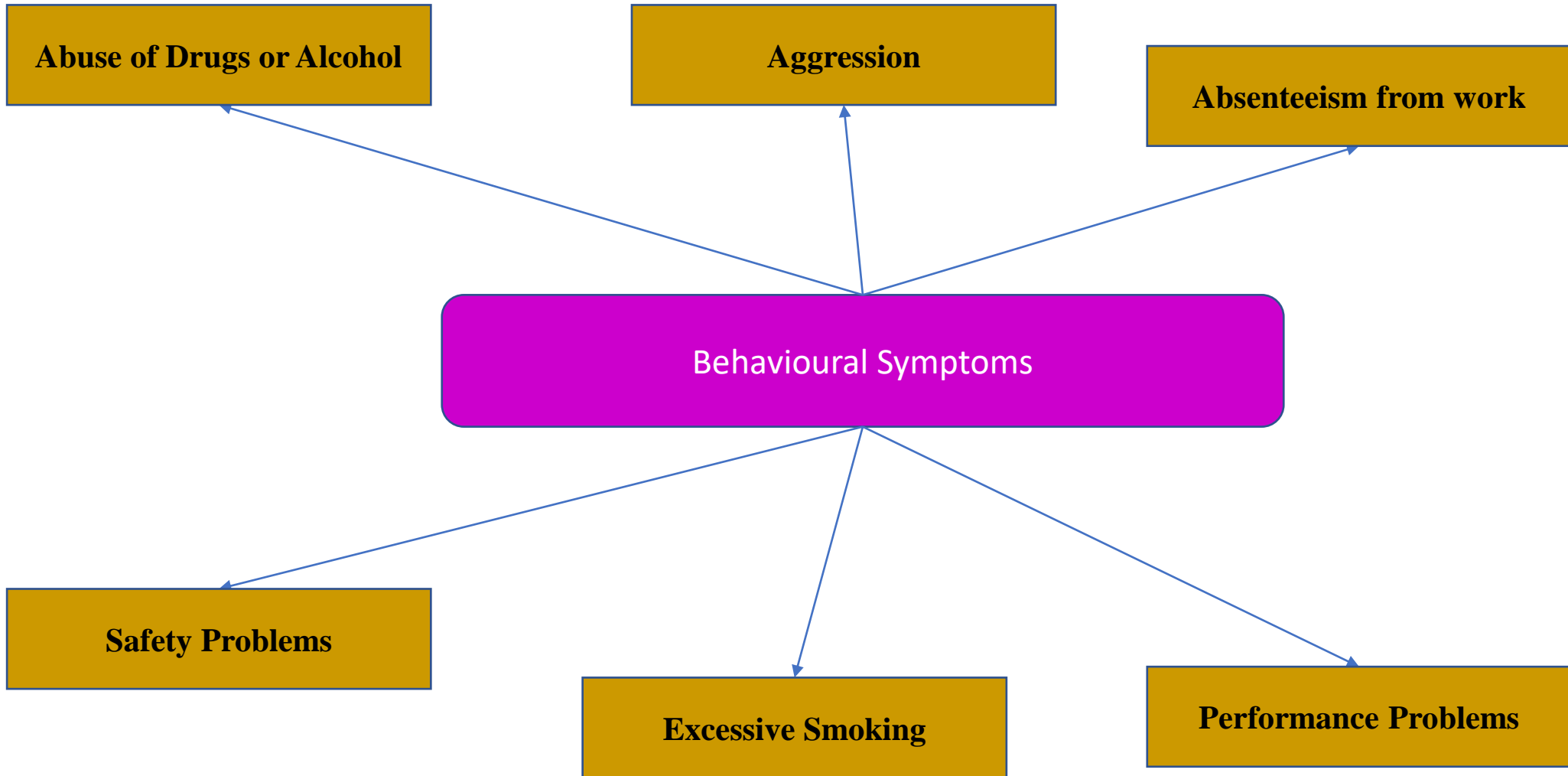
2) Psychological Impacts :- Disasters cause severe, intense psychological impact on human beings. The first experience of disaster is- Shock & Trauma. Then there is depression, anxiety (Nervousness) & then actual realisation of-what has happened & what could not have happened. Fear spreads among people.

Stress related symptoms :- For some individuals, stress is just unmanageable & beyond one's own control, thus difficult to handle. Unmanageable stress has 3 symptoms:-

- i) Physiological**
- ii) Psychological**
- iii) Behavioural**



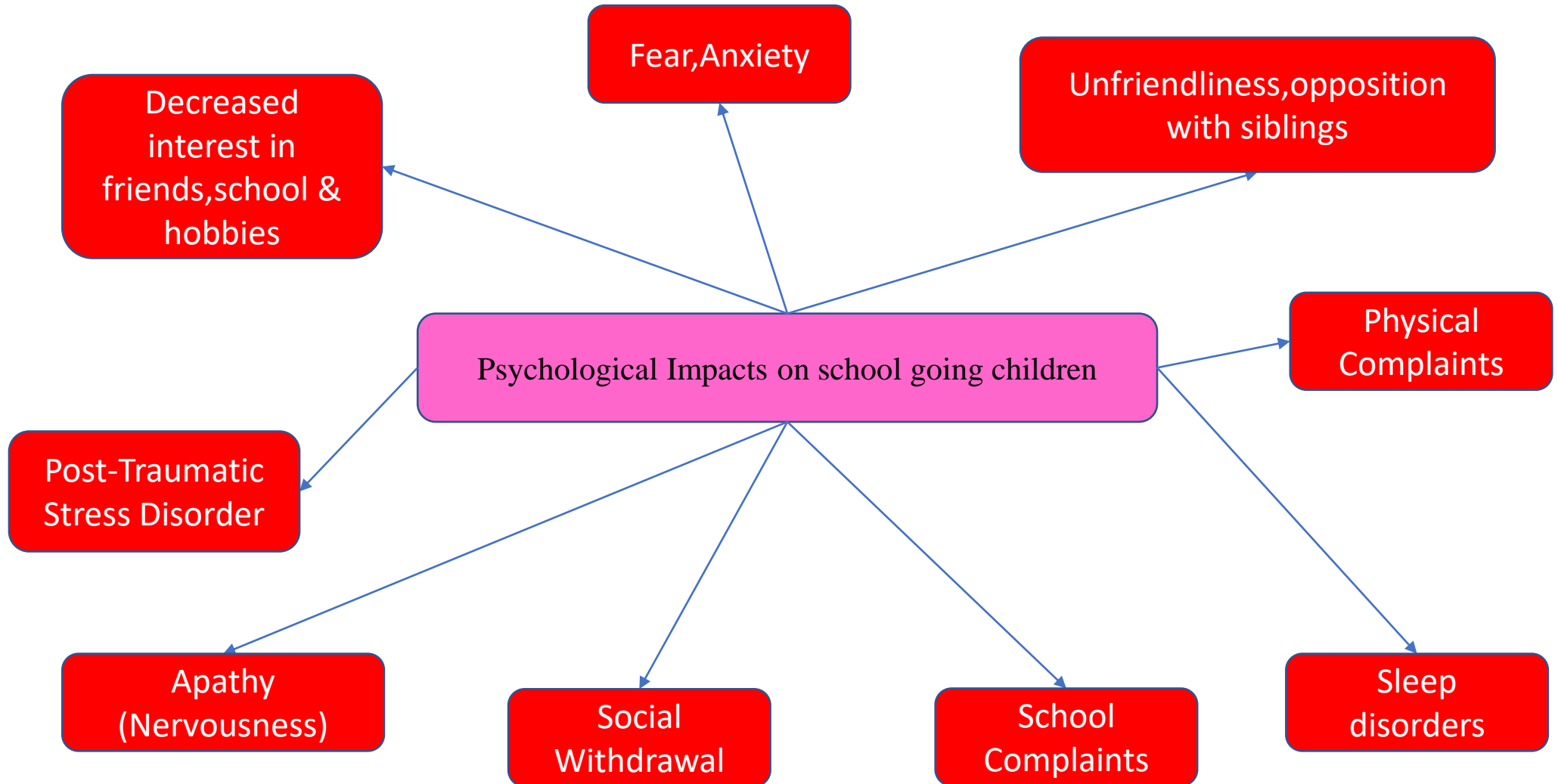




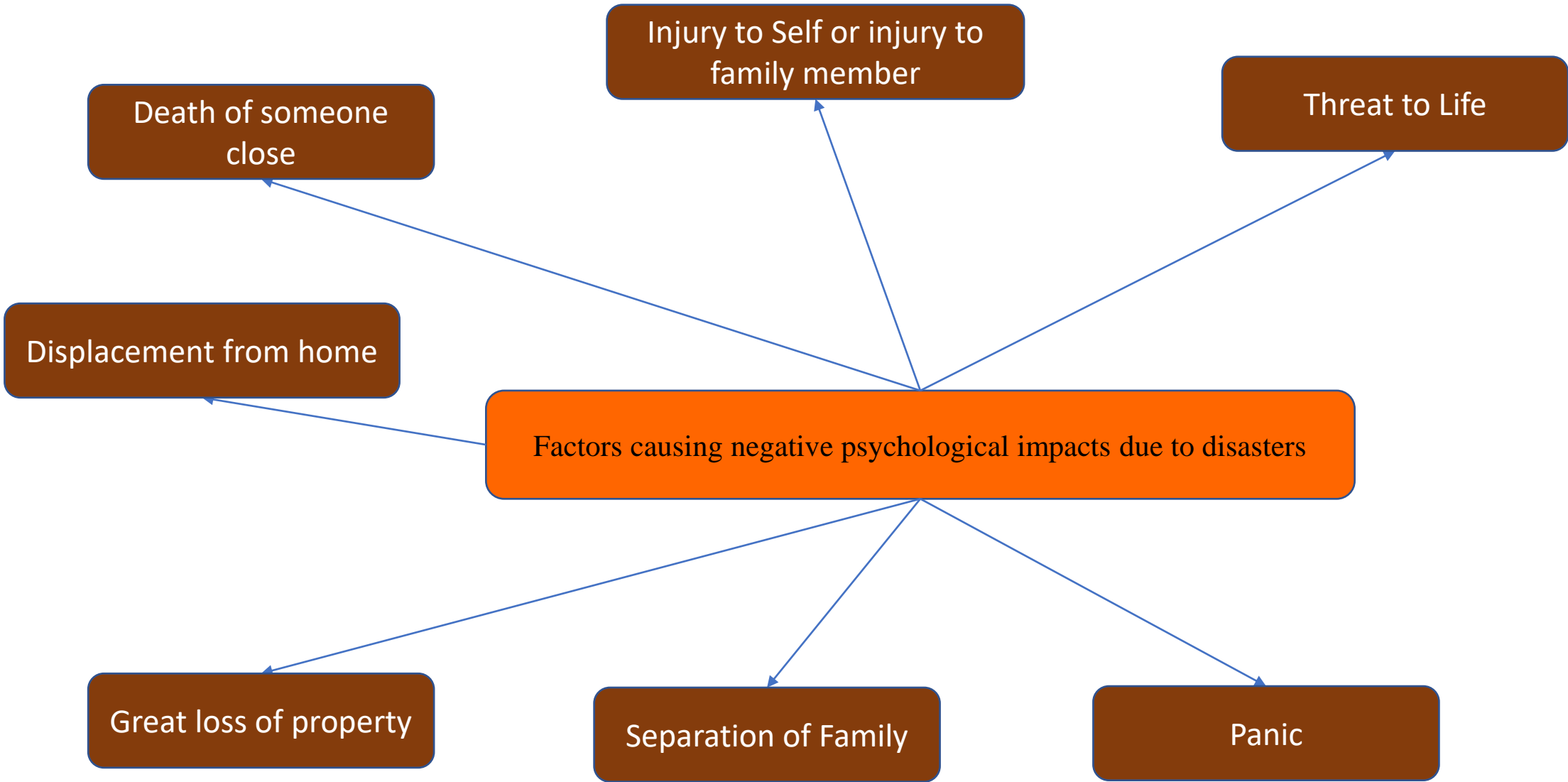
➤ **Stress Related Risk Factors :-**

- i. **Severity of Exposure** :- Severe distress & mental health problems develop amongst both kind of people. People who actually face the disaster & people who are in close contact with disaster victims.
- ii. **Gender & Family** :- Females & small children undergo a lot of mental trauma as most of them are emotionally sensitive.
- iii. **Age-Factor** :- People in the **age group of 30-60** suffer a lot mentally as they have **job tension**.

A study undertaken by **USA psychiatrists** had indicated following **psychological effects** on school going children :-



- **Bureaucratic Hurdles** :- Generally Bureaucracy is ridden with red tape & thus there are delays supply of- Compensation & Rehabilitation Packages, which further aggravates the trauma of victims who are already trying to cope with injury, death of family member & property loss.
- **Other Factors** :- There are several other factors which cause negative psychological effects due to disasters :-



3) Economical Impacts :-

- i. Unemployment :-Disasters result in economic loss to survivors on account of unemployment.The unemployment caused by disaster could be **Short-Term** or **Long-Term**.

Short-term Unemployment is due to destruction of-Infrastructure,damage to factories,offices or vehicles.

Long-term unemployment is due to physical injuries caused by disasters making people unable to perform work.

Due to disasters, people from **unorganised sectors like-Fishermen, Farmers, Auto Rikshaw Drivers** suffer the most, as their source of livelihood is directly affected by disasters.

- ii. **Loss of Assets** :- Disasters like- Earthquakes, Tsunami & Hurricanes cause damage to property. People lose their valuables like- **cash, crucial documents & jewellery**. Disasters like Floods & Draughts cause damage to valuable agricultural land. Land becomes dry, infertile & saline leading to loss of agriculture.

- iii. **Injury** :- A lot of money is needed in order to treat injuries. Government compensation may be limited or not at all received.
 - ✓ For example, over 5lakh victims of Bhopal Gas Tragedy were left without any compensation announced by Government of India.

- iv. **Death of Earning family member** :- Some families have only one as a sole bread winner. Thus death of crucial earning family member can cause severe stress & strain to survive in post disaster time for disaster survivors.

4) **Social Impacts :-**

- i. **Caste & Communal Discrimination** :-In post disaster period, survivors face caste & communal discrimination.

- ii. **Problem of Social Networking** :- As disasters take away our near & dear ones like-Friends,neighbours,relatives,family members etc., social networking or connectivity of survivors is lost.They feel loneliness ,which leads to stress & mental complications.

- iii. **Caste & Communal Disturbances** :- Man made disasters lead to caste & communal disturbances in the form of riots,burning of buses, shops.
✓ For e.g. in Godhra Train Disaster of 2002 in Gujarat,as there was a communal riot between Hindus & Muslims.

- iv. **Adverse social effects on Women** :- In man made disasters like Civil Disturbances, wars or battles, local male goondas (Hooligans) target young girls & women. They are sexually harassed and violated.

- v. **Social Evils** :- As disaster leads to unemployment, People may commit unethical acts like theft, murder & robbery in order to overcome economic loss & gain money.

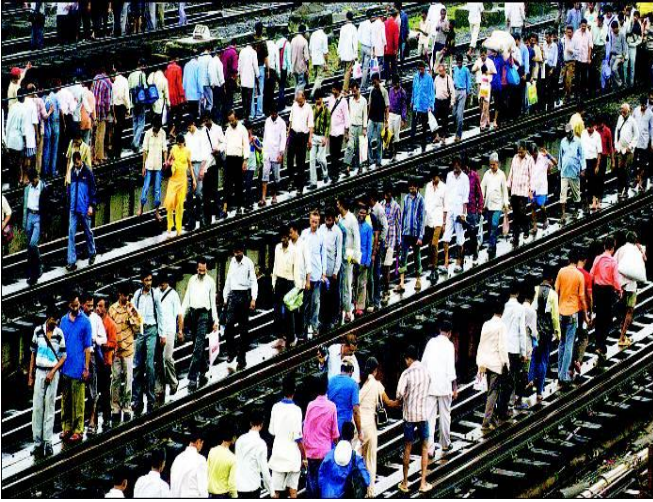
- vi. **Social Problems of Scheduled Tribes** :- As disaster forces people to displace, tribal people lose their cultural, social individual identity associated with their forest habitat.

Locally relevant case studies of environmental disasters

➤ **Case –Study A :- Maharashtra Floods 26th July, 2005.**



- The floods were caused by the 8th heaviest (In India) ever recorded 24 hour rainfall of 994 mm which lashed the city of Mumbai. The heavy rains led to flooding in other parts of Maharashtra which seriously got affected like-Raigad, Chiplun, Khed, Ratnagiri & Kalyan as well as parts of Goa.
- Approximately 5000 people died and there was a huge financial loss due to the stoppage of all commercial, trading and industrial activity.
- Lakhs of people including children were stranded on the roads and railway platforms.
- Local train movements came to a halt by 2:30 p.m. due to waterlogging on Railway tracks. Other modes of transport like the railways and airlines were disrupted till 6th August.
- Situation got worsened when cellphone networks went down at around 5 p.m. & landlines of MTNL were partially functional.
- Lack of public information added to the chaos. Even the electricity of suburban areas was cut due to submerged power stations.



- Thousands of animal dead bodies floated in the flood waters, raising concerns about the possibility of diseases. Media reports warned of the threat of waterborne diseases.
- 52 local trains, 4000 taxis, 900 BEST buses, 3700 auto rickshaws, 10,000 trucks & tempos got badly damaged. Thousands of private cars were rendered useless. The entire government sprang into action for relief and rescue.
- All those who were stranded were safely evacuated by buses provided by the BEST and rescue boats requisitioned by the Navy.
- The evacuated people were sheltered in public schools and transit shelters.
- The traffic police and fire brigade cleared 26000 vehicles from the road.
- 24000 animal carcasses were disposed and more than 2 lakh tonnes of garbage was mopped up.
- There was relief provided to all those who were stranded. Nearly 25000 people were given relief.

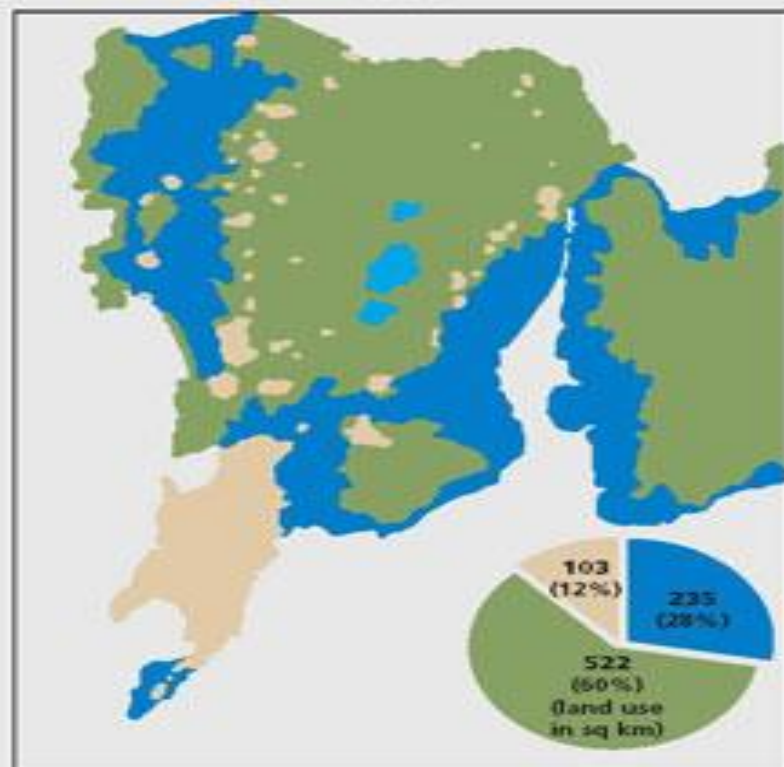
Factors responsible for such a disaster

- Occurrence of two flood waves on the same day between 2:30 to 4:30 p.m. and 8 to 10 p.m. occurring during high tide and low tide.
- The present water drainage system in Mumbai was put in place in early 20th century and is capable of carrying 25.1237mm of water per hours.
- The Powai lake overflowed and released 5.95 million cubic meter of water into the Mithi river.
- The clogging of the drainage system led to water being unable to be dispersed into the sea.
- Uncontrolled , unplanned development of the suburbs also added to the woes of the people.

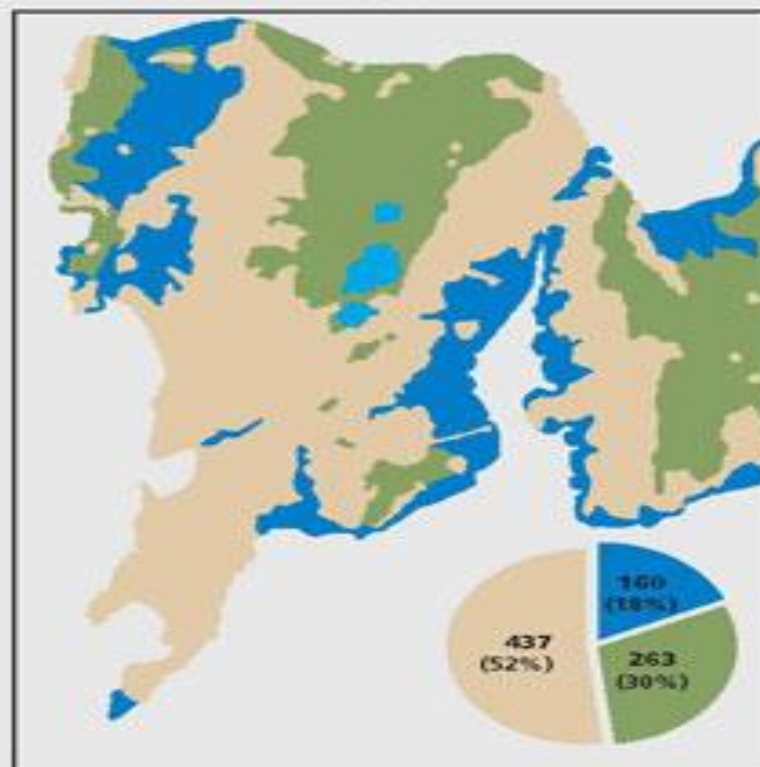
MAP: BUILT-UP AND CHOKING

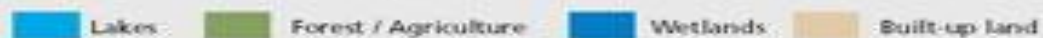
How Mumbai has been developed, and how its land-use has evolved...

1925



1994



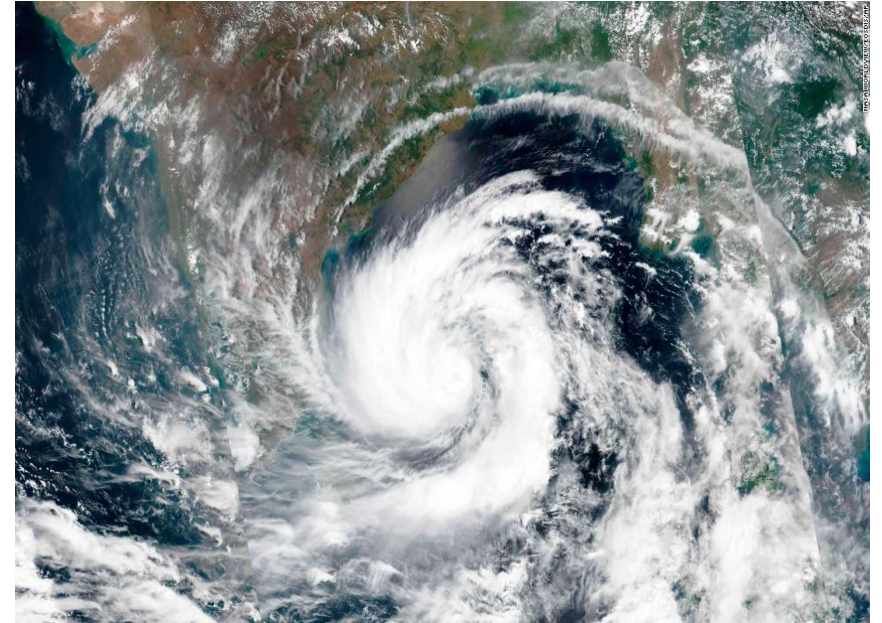
 Lakes: Forest / Agriculture: Wetlands: Built-up land

According to latest figures, the ratio of open space to population in Mumbai is a mere .03 acre (.012 hectare) per 1,000 persons. The desired level is 4 acre (1.67 hectare) per 1,000 persons.

 [Enlarge View](#)

Case –Study B :- Cyclone Amphan 20th May, 2020

- On 20th May between 10.00 and 11.00 am the cyclone made landfall in West Bengal.
- Estimated speed was 1 minute sustained winds to be 240 km/h.
- The areas affected by the cyclone were East Midnapur, North 24 Parganas, South 24 Parganas, Kolkata, Hooghly and Howrah as well as Northern Odisha.



Measures taken by the Government

➤ The Fishermen were asked not to sail in the Bay of Bengal from 15 – 20 May.

➤ Public Works Department were called upon by Odisha Government.

➤ Crews and backup systems for electricity and telecommunications were deployed to meet these needs .

➤ Rail and Vehicular traffic in Odisha and West Bengal was halted or rerouted.

➤ Over 141,000 people were moved to shelter in coastal Odisha.

➤ 300,000 people were moved to shelter in West Bengal.



Impact on West Bengal

- Amphan made landfall near Bakhali in W. Bengal at 2.30 pm IST on 20th May.
- 70% of population was affected
- 86 people died in West Bengal
- Storm caused 1 trillion loss in damage.
- An International Airport recorded wind speed upto 133km/h.
- 4000 electric poles were toppled.
- 266mm of rain was recorded in Kolkata.
- 5,500 homes were damaged in N.24 Parganas.
- About 26,000 homes were destroyed in Gosaba.
- 88,000 hectares of rice paddies & 200,000 hectares of vegetables and sesames crops were destroyed.



Impact in Odisha

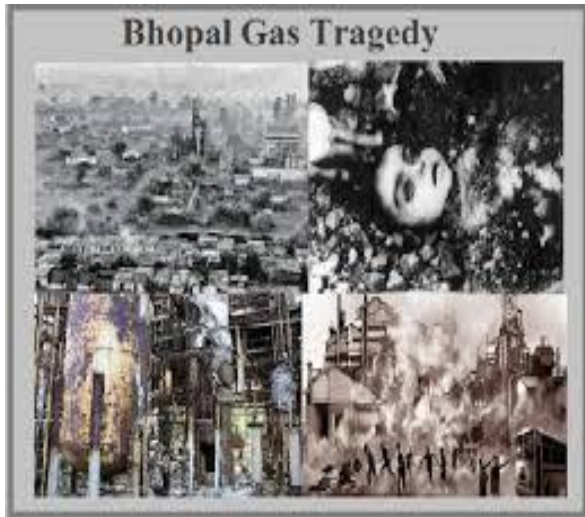


- Wind speed 106km/h
- Rainfall 300mm
- 4.4 million people were affected .
- 500million homes were destroyed
- 4000 livestock died.

Aftermath of the Disaster

- On 22nd May PM Modi conducted Aerial survey of Kolkata
- 10 billion immediate relief package for W. Bengal
- 5 billion for Odisha
- RS 2,00,000 would be provided to the next kin of people who died during the storm.
- 50,000 would be given to the injured person.

➤ Case –Study C :- Bhopal Gas Tragedy-3rd December 1984



- On the night of December 2- 3, 1984, chemical, methyl isocyanate (MIC) spilt out from Union Carbide India Ltd's (UCIL's) pesticide factory & turned the city of Bhopal into a colossal gas chamber.
- It was India's first major industrial disaster.
- At least 30 tonnes of methyl isocyanate gas killed more than 15,000 people and affected over 600,000 workers.
- Bhopal gas tragedy is known as **world's worst industrial disaster**.



Earlier leaks

1976 : Two local trade Unions complained of pollution within the plant.

1981: Worker splashed with phosgene leading to his death 72 hours later.

1982 (Jan): A phosgene leak affected 24 workers.

1982(Feb): A MIC leak affected 18 workers.

1982 (Aug): A chemical engineer suffered severe burns.

1982(Oct): Another supervisor suffered severe chemical burns.

MIC LEAK

- 3rd December 1984 at 12.40 AM Methyl Isocyanate gas was leaked .
- About 30 tons of Methyl Isocyanate escaped from the tank into the atmosphere in 45 to 60 minutes.
- In subsequent 2 hours 40 tons were released in the air.
- This was due to malfunctioning tanks and pipes that held MIC.
- Lack of adequate measures taken by the Company as well as the government led to this disaster.
- The gases were blown in a southeasterly direction over Bhopal.

- The initial effects of exposure were coughing ,sever eye irritation and feeling of suffocation.
- Those who ran inhaled more as compared to those who fled by the car.
- Children and other residents of shorter stature inhaled higher concentration due to the heavier density of the compound.
- Within a few days, trees in the vicinity became barren.
- More than 3000 people were killed instantly while 16000 claimed to have died later due to the disaster and 600,000 were affected.
- 2000 animals died
- The residents suffered a 300% stillbirth rate and neonatal mortality rate to 200%. Those children that were born had birth defects.
- Many people continue to suffer the impact to this day.

➤ **Case –Study D :- Oil Spill of MSC CHITRA & MV KHALIJIA-7thAugust 2010**

- MSC Chitra ship was listing on one side after it collided with MV Khalija III ship on 7th August 2010.
- The engine room of Chitra got gradually flooded and the rough seas were forcing out oil from the ship's bilge.
- Nearly 800 tonnes of oil was believed to have leaked out in Arabian Sea & was seen floating close to the coastline threatening marine life.
- There were 8 main fuel tanks on the board ship & two of these tanks leaked out tones of oil into the sea.
- Coast Guard Helicopters sprayed anti-dispersants to prevent the oil spill from spreading.



- A team from Holland was also called up to help in controlling the spill.
- The oil spill spread over an area of 25 Square Kilometres & the hazardous chemicals & pesticides from 31 containers affected almost 200 species of marine life.
- Mangroves of Navi Mumbai were in danger of getting destroyed & the debris caused by collision of ships posed negative problems for other ships moving in that direction.
- A US Company specialized in sinking vessels was hired.
- The company decided to drown the ship to about 350 nautical miles off city in international waters outside the bounds of Indian agencies.



The effects of an oil spill on life forms:

- **Birds: a huge impact on 350 species of birds. Nearly 40% are migratory.**
- **Mammals: that live in the mangrove regions can get impacted**
- **Reptiles: that live in the mangrove areas.**
- **Other marine flora and fauna: severe damage to fishes and other aquatic animals.**

Case –Study E :- Indian Ocean Tsunami-26th December 2004

This tsunami was particularly devastating because:-

- The earthquake which caused the tsunami was magnitude 9.
- The epicentre was very close to some densely populated coastal communities, eg Indonesia. They had little or no warning. The only sign came just before the tsunami struck when the waterline suddenly retreated, exposing hundreds of metres of beach and seabed.
- In some coastal areas, **mangrove forests** had been removed to make way for tourist developments and therefore there was less natural protection.



Damaged Mangrove Forests

❖ **SOCIAL IMPACTS OF TSUNAMI :-**

- 230 000 deaths.
- 1.7 million homeless.
- 5-6 million needing emergency aid, e.g. food and water.
- Threat of disease from mixing of fresh water, sewage and salt water.
- 1,500 villages destroyed in northern Sumatra.

❖ **ECONOMIC IMPACTS OF TSUNAMI :-**

- Ports ruined. Fishing industry devastated - boats, nets and equipment destroyed. An estimated 60% of Sri Lanka's fishing fleet destroyed.
- Communications damaged, e.g. roads, bridges and rail networks.



❖ **ENVIRONMENTAL IMPACTS OF TSUNAMI :-**

- Crops destroyed.
- Farm land ruined by salt water.
- 8 million litres of oil escaped from oil plants in Indonesia.
- Coral reefs and coastal wetlands damaged.



Coastal Wetlands



Coral Reefs

❖ RESPONSES TO TSUNAMI:-

➤ Non-Governmental Organisations (NGOs) and local authorities typically have **immediate** and **secondary** responses to devastation of this kind

❖ **Immediate responses**

- Search and rescue.
- Emergency food and water.
- Medical care.
- Temporary shelter.
- Re-establishing infrastructure and communications.

❖ Secondary responses :-

- Re-building and improving infrastructure and housing.
- Providing jobs and supporting small businesses.

❖ **Short-term responses :-**

- In many areas local communities were cut off and had to help themselves.
- The authorities ordered quick burial or burning of the dead to avoid the spread of disease.
- Food aid was provided to millions of people, eg from the World Food Programme.

❖ **Long-term responses :-**

- Reconstruction is still taking place.
- International scale: an Indian Ocean tsunami warning system has now been set up.

Case –Study F :- Norilsk Oil Spill , 29th May,2020

- Russia declared a state emergency on June 3 after a massive oil spill in Arctic region.
- Around 20,000 tons of fuel from a power plant in Norilsk leaked into river on May 29.
- Plant is located near Norilsk city , around 3000 km Northeast of Moscow.
- The oil leaked into the Ambarnaya river that flows into the environmentally sensitive Arctic Ocean.
- An estimated 15,000 tones of diesel leaked into the river Ambarnaya , turning its surface red .
- The rest leaked onto the surrounding land .
- The spill contaminated a 350 sq. km. area .



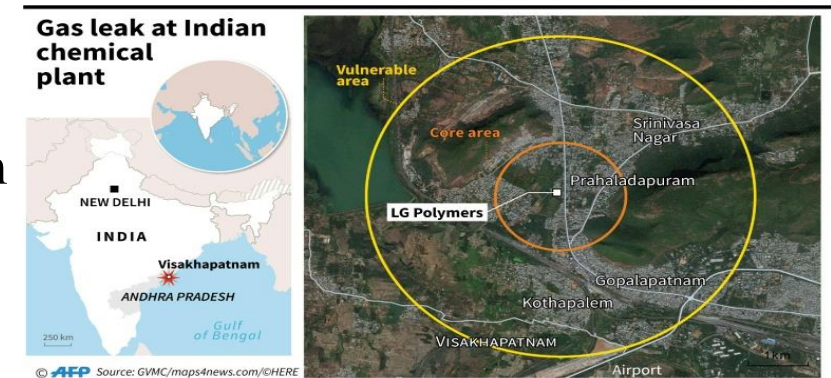
- The Thermoelectric power plant at Norilsk is built on Permafrost .
- The permafrost had weakened over the years due to climate change.
- This caused the pillars supporting the plant's fuel tank to sink .
- Russian President said that a state of emergency was needed to call in more resources for the clean up efforts.
- The magnitude of the spill , shallowness of the Ambarnaya river and the difficult weather conditions make clean up efforts challenging .
- Nearly 700 people are involved in the massive clean up .
- Booms are being used to contain the diesel on the river surface and pump into tanks on the bank.



- The teams have set up tents and are using helicopters to bring in equipment .
- Experts say that the clean up could take anywhere between five to ten years.
- It is said that clean-up could cost 100bn rubles .
- The Russian investigative committee has launched a criminal case over the pollution and alleged negligence as there was reportedly a two day delay informing the Moscow authorities about the spill.
- The power plants director has been taken into custody until 31 July but not yet charged.

Case –Study 7 :- Vizag Gas Leak

- Many have died , several hospitalized after gas leak incidents From LG Polymers Plant in Vishakhapatnam
- The plant was re-opened on 7 May 2020 following the nationwide lockdown .
- There was leak of styrene gas from the plant
- The Leak occurred at the LG Polymers Plant at around 2.30a.m on 7 May 2020.
- The fumes spread over a radius of 3km. (Five villages (R. R. Venkatapuram, Padmapuram, BC Colony, Gopalapatnam, and Kamparapalem) were the most affected areas.



Probable cause of leakage

- Mekapati Goutham Reddy, minister of industries of Andhra Pradesh, said that the preliminary conclusion from the experts' inspections was that the storage facilities were not designed to keep the material for a long duration.
- However, the plant personnel claimed that the material was emptied every 10 to 15 days and never stored more than the



EFFECTS

- Hundreds of people were rushed to hospitals following widespread breathing difficulties , vomiting and sensations of burning eyes.
- Many had been found lying on the ground, unconscious as a result of gas exposure.
- The death toll was thirteen as per NDRF.
- More than 1,000 people were reportedly exposed to the gas



Relief and rescue

- Nearly 200-250 families were evacuated from villages in a five-kilometer radius around the plant.
- Chief Minister of Andhra Pradesh, Y. S. Jaganmohan Reddy, announced an Rs1 crore for each family of those killed as a result of the accident.
- He also announced RS25,000 for those who received primary treatment .
- RS1 lakh for those who received longer treatment.
- RS1 million for those on ventilator support.

Dealing With Disasters

❖ What is Disaster Management?

It involves policy decisions and operational activities relating to various stages of disaster such as :-

- Pre-disaster stage
- Disaster occurrence stage
- Post-disaster stage

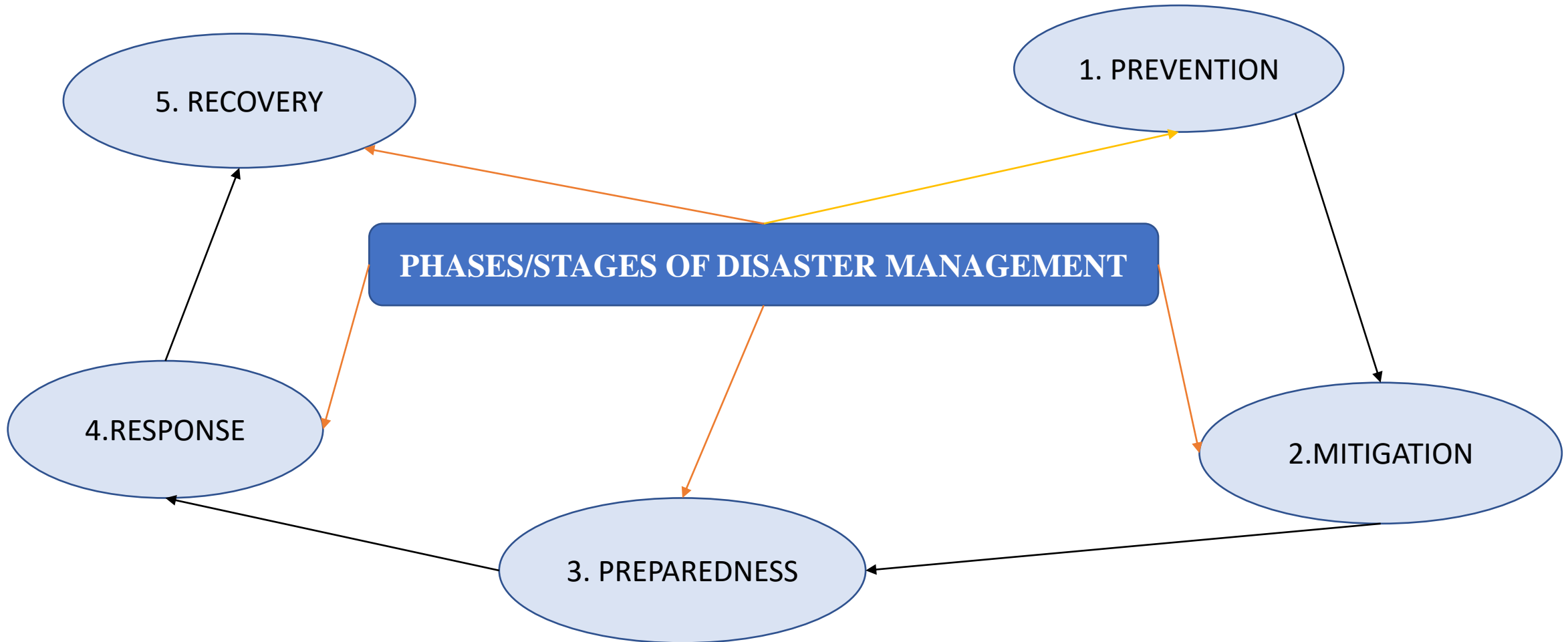
❖ What are its aims?

Disaster Management aims at :-

- Avoiding or Minimizing the potential losses
- Ensuring quick & reasonable assistance to disaster victims
- Achieving effective recovery

❖ What are its phases?

The process of disaster management involves the following phases:-



➤ **Prevention** :-

It involves all those activities which are necessary to prevent the disaster or to prevent the gravity of loss, when disaster takes place.

1. Disaster Management Action Plan (DMAP) :-

- The state Disaster Management Action Plan (DMAP) is prepared for its operationalization by various departments & agencies of the Government of Maharashtra & other Non-Governmental Agencies who have responsibility of Disaster Management.

The purpose of this plan is to evolve a system to -

- Assess the status of existing resources and facilities available with various departments and agencies involved in disaster management in the state.
- Assess their adequacies in dealing with a disaster

- Identify the requirements for institutional strengthening technological support, up gradation of information systems and data management for improving the quality of administrative response to disasters at the state level.
- Make the state DMAP an effective response mechanism as well as a policy and planning tool.

This plan provides for Institutional Arrangements, Role & Responsibilities of various agencies , interlinks in disaster management & the scope of their activities.

2. Disaster Warning :-

Disaster management authorities have to plan for early warning of upcoming disaster and its effects. For e.g. in case of a storm or hurricane, advance warning has to be given to citizens so that they will get time to:-

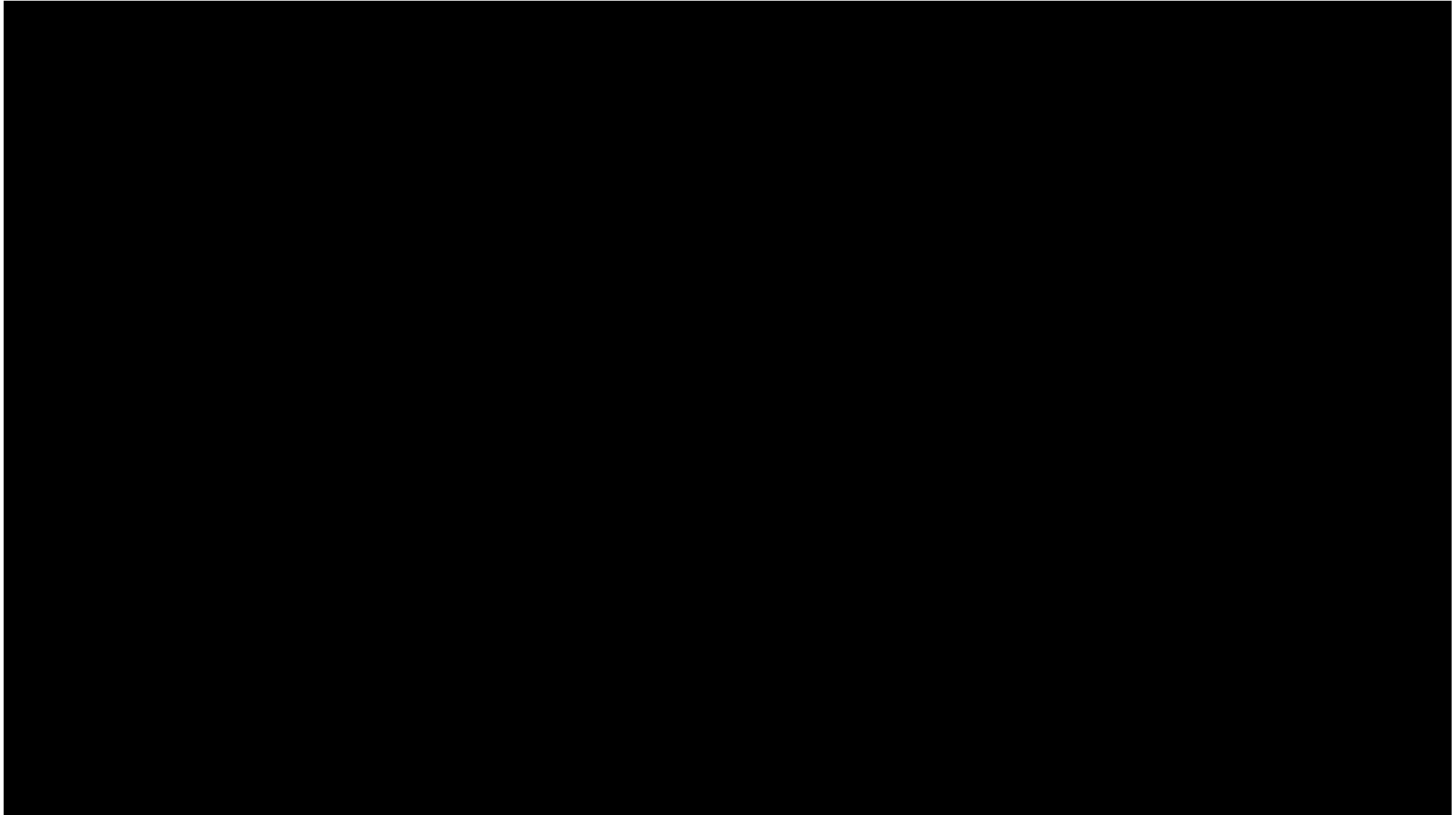
- **Protect property**
- **Safeguard family members**
- **Move to a safer place**
- **A warning system** is essential to indicate disaster onset. It includes the following:-
 - ❖ **Alarms** (for e.g. in case of fires),
 - ❖ **Sirens** (for e.g. in Industrial Accidents),
 - ❖ **Public announcement** via mass media like **newspaper, television, radio** or **social networking sites** & Other traditional methods like- **Beating of drums, Ringing of bells & hoisting of flags.**

□ Important Elements of warning :-

- Communities in disaster prone area are made aware of warning systems.
- Alternate warning systems must be kept in readiness in case of technical failures (such as power failure)
- All available warning systems should be used
- All relevant agencies and organisation should be alerted.
- Wherever possible assistance of community leaders and organised groups should be taken in explaining the threat.
- Warning should give clear idea about-Severity, duration & areas that are likely to be affected

- Warning should be conveyed in a simple, direct & non-technical language to incorporate day to day usage patterns.
- Warning should be followed by subsequent warnings to keep the people updates of the latest situation.
- The do's & don'ts should be clearly communicated to the community to ensure appropriate responses
- There should be control on spread of rumours
- As soon as the disaster situation passes away, '**ALL CLEAR SIGNAL**' needs to be given.

3. Education and Training: There is need to educate the various sections of the society on disaster management.



➤ **Mitigation** :- **Mitigation** effort are attempts to prevent hazards from developing into disasters. It is the effort to reduce loss of life & property by reducing the impact of disasters.

□ **Stages of Mitigation** :-

- i. **Risk Analysis** :- needs to be conducted to generate information which provides a foundation for mitigation activities that reduce risk. For example, insurance can be obtained to protect financial losses.
- ii. **Structural & Non-structural measures** :- Mitigation involves **structural & non-structural** measures which limit the impact of disasters. Measures can be taken at an individual or Government level.
 - **Structural changes** involve modification in structure of building (Such as retrofitting for earthquakes to make the building resistant to earthquake) or change of surroundings.
 - **Non-structural mitigation measures** includes-obtaining property or building insurance or building the house at a safer place. These may include legislation or regulation regarding evacuation, sanction against those who refuse to obey mandatory regulations and communication of risks to the public.

❖ Objectives/Goals of Mitigation :-

- **To prevent hazards from developing into a disaster :-** Mitigation aims to reduce loss of life & property by mitigating the impact of disaster.
- **To Protect public health & safety :-** Authorities & agencies need to advise the public about safety & health precautions to protect against injury & loss of life from hazards.
- **To safeguard properties :-** Authorities need to protect buildings and public infrastructure from disasters. There is a need to maximise insurance coverage for providing financial protection against hazards.
- **To increase public awareness :-** Public needs to be educated on actions which they can take to prevent or reduce the loss of life or property from hazards.

- **To facilitate communication & coordination :-** Communication & coordination has to be facilitated within & among the central, state and local authorities in carrying out Hazard mitigation.
- **Capacity building :-** Authorities have to promote adequate staffing, training & expertise in order to carry out hazard mitigation.
- **To provide relief camps :-** Authorities need to provide relief camps/temporary accommodation facilities in case of major disaster such as-floods, storms for certain months post disaster.
- **To provide Package for Reconstruction Work :-** A long term objective of hazard mitigation is to provide a special package for reconstruction work to rehabilitate damaged infrastructure.

❖ **Relief & Rehabilitation Measures** :- These are important elements of Mitigation to be undertaken by Government & NGO.

□ **Immediate Relief Measures :-**

- Relief camps in case of major disasters such as Earthquakes , Cyclones, Floods.
- ✓ **For example**, during Tsunami of December 2004, 207 relief camps were made available in Andaman & Nicobar islands which provided shelter to around 46,000 people.
- Ex-gratia payment to the next of kin of all dead or missing persons. (Payment done out of moral obligation & not out of Legal Requirement)
- Compensation for loss of crop & livestock.
- Drinking water facilities need to be provided wherever necessary.
- Special relief ration need to be provided to the affected people.

❑ Social Services :-

- Time to time preventive measures need to be taken in order to prevent any outbreak of communicable diseases.
- ✓ For Example, During Mumbai Floods the carcasses were immediately removed and the garbage cleared. People were asked to put chlorine in water to purify it for household purposes.

- Health Centres need to be made functional at the earliest to provide medical care and treatment.

- Schools need to be opened at the earliest with a temporary structures. Schools can play a vital role to reduce post traumatic stress disorder of school children with the help of mentor teachers or school psychiatrists.

- Free medicines need to be supplied especially those with injuries.

□ **Long Term Measures :-**

- Central & State Government should come up with long term measures to rehabilitate affected people.

Some of the long term measures include :-

- A special package for reconstruction work to rehabilitate the damaged infrastructure.
- Reconstruction of permanent houses & community infrastructures such as
- Community halls or centres, religious structures, Schools, Primary Health Centres , Panchayat offices, etc.
- Restoring livelihood of self-employed ,fishermen, artisans and others. The self- employed and micro units may be provided with processing and marketing facilities.

- Reconstruction of local transport facilities such as- **Jetties, Railway station** is needed as **transport is a lifeline of economy.**
- Reclamation of land affected by salinity and inundation as well as replacing lost livestock , if compensation is not paid earlier.
- Restoration of damaged power & Information Communication Technology Infrastructure.
- Upgrading drinking water supply and drainage systems in affected areas.
- Construction of social infrastructure such as schools, primary health centres.

➤ Disaster Preparedness :-

- **Disaster preparedness involves measures designed to organize and facilitate timely and effective rescue, relief and rehabilitation operations in case of disaster.**
- ✓ It also involves :-
 - Training of specific groups to undertake rescue & relief
 - Setting up disaster relief machinery
 - Stocking of supplies
 - Formulation of emergency relief plans
 - Arrangement of funds for relief operations

□ Activities under Disaster-Preparedness :-

- **Communication Plans** :- Proper communication plans are needed to be prepared in order to warn people about the possible threat of disaster & to carry out relief & rehabilitation operations more effectively.
- **Training** :- Emergency preparedness & capacity development in terms of adequately trained human resources and infrastructure are the basic issues in pre-event planning. The government must develop organisations of trained volunteers among civilian population.
- **Casualty Prediction** :- Casualty prediction is-The study of how many deaths or injured persons are expected in a particular kind of disaster. It gives an idea about the resources which are needed to be in a place to respond to a particular kind of event.

- **Stockpiling :-** Stockpiling of food supplies, other disaster supplies & equipment is essential. There is a minimum recommendation of at least 3 day supply of food & water.
- **Evacuation Plan :-** Disasters may require evacuation (Shifting/migration from original place) of communities. Since each situation demands different strategies hence the responsibility for the ordering of evacuation is assigned to different agencies
- ✓ **Evacuation should be ordered only by Government authorities such as- The Collector , Police or Fire-Brigade.**
- ✓ **To maintain law and order the evacuation should be done with the assistance from community leaders.**
- ✓ **All evacuations should be reported to the Collector or District Superintendent of Police.**

❖ Measures needed to be taken for evacuation :-

- ✓ Shelter sites should be within one hour walk or 3 miles(5 Km) from the place of dwellings.
- ✓ The evacuation routes should be away from disaster prone areas like the coast or flood prone areas.
- ✓ Families need to be encouraged to take along with them water, food, clothing & emergency supplies to last at least for 3 days. They should also listen to battery powered radio and follow local instructions.
- ✓ People are needed to be evacuated on urgent basis in case of chemical release.
- ✓ Emergency transport for seriously injured can be arranged via **speed boats & helicopters.**
- ✓ A senior medical officer needs to accompany the rescue team along with required medical kits & needs to ensure priority shifting of those who are seriously injured or require immediate medical attention.

➤ **Response Phase**:- It includes mobilization of necessary emergency services.

Response phase includes following **events** :-

- Setting up control rooms
- Putting the contingency plans into action
- Issue warning action for evacuation
- Taking people to safer shelters
- Providing medical aid to the injured
- Assessment of the situation
- Mobilisation of the resources

❖ **Response** includes 3 phases :- **Pre, During & Post Response Phase** :-

- **Pre-Disaster response plan** :- It intends to reduce the impact of disaster on life & property of the society by setting control room & evacuation of people.
- **Response Phase** :-During disaster,it is necessary to ensure that steps are taken to minimize the loss of life & property.
- **Post Response Phase** :- It is to achieve rapid & effective recovery from disaster.

➤ **Recovery Phase** :- The aim of recovery phase is to restore the affected area to its previous state. Recovery efforts are concerned with issues and decisions that must be made after immediate needs are addressed.

❖ Recovery efforts are concerned primarily with actions that involve :-

- Disaster Assessments
- Damage Clearance
- Immediate Rehabilitation
- Reconstruction Planning & Implementation.
- Counselling and providing social support to the disaster survivors.

□ The activities under recovery phase are carried out in two stages :-

1) **Short Term Recovery Activities** :- They aim to return to life supporting systems such as- Shelter, food, water, clothing & medicines to a minimum operating status for the time being.

2) **Long Term Recovery Activities** :- They may take several months or years to return life to normal or better levels. They are time consuming & need patience. They include-

- Provision of financial assistance for redevelopment
- Legal Assistance if needed
- Livelihood Support
- Counselling
- Psychological Assistance

Human Rights Issues in addressing disasters

Pratik singh

VIOLATION OF HUMAN RIGHTS REGARDING –COMPENSATION & RELIEF DISTRIBUTION

Types of violation

Discrimination in relief distribution based on

Caste

Gender

Economic Class

Geographical location

Lack of concern for children

Harassment of the victims while claiming compensation

General atrocities of backward castes

Neglect of Women Rights

Lack of information

VIOLATION OF HUMAN RIGHTS REGARDING – COMPENSATION & RELIEF DISTRIBUTION

- ❖ **Discrimination in Relief Distribution** :- The victims face a lot of discrimination during the time of disaster especially when relief distribution is carried out .
- **Caste based Discrimination** :- The "Equality in Aid" report (2014) by the International Dalit Solidarity Network said around 260 million people in countries such as India, Sri Lanka, Pakistan, Nigeria, Senegal, Yemen and Japan face caste-based prejudice and human rights violations in their everyday lives.
 - This increases manifolds during disasters especially when relief distribution and compensation is carried out .
 - Due to their socio-economic standing, these castes are more susceptible to discrimination as have been observed during the time of disasters.
 - ✓ E.g.- Discrimination during the Cyclone Thane (2015) and Cyclone Gaja (2018) in Tamil Nadu and Cyclone Fani in Orissa (2019) where caste discrimination has been rampant.

➤ **Gender discrimination** :- Women are excluded from receiving relief & rehabilitation assistance.

- Many a times they have been denied land titles and inheritance rights.
- Most disasters place an undue burden on women and girls who are responsible for unpaid work such as providing care, water and food for households.
- Agricultural work, often performed by women, is especially subject to many types of hazards.
- When discrimination occurs it increase the plight of women ten fold.

➤ **Economic Class based discrimination** :- It has been observed that economically privileged class of people use their influence to quickly gain private compensation & reconstruction loan after a disaster.

- Whereas economically backward class people like- poor farmers, land labourers & fishing Community gets little or no compensation.
- The report, funded by the European Commission Humanitarian Aid and Civil Protection Office (ECHO), said one of the biggest problems facing low-caste groups was that they have very few assets and therefore do not qualify for compensation - pushing them further into poverty and deprivation.

- **Geographical Discrimination** :- Geographical Discrimination also occurs in relief distribution and compensation. This is generally due to the concentration of a particular caste in an area.
- E.g. Post Gujarat earthquake, people from places like-Bhuj & Bhachau got compensation but the people of Rapar & Anjar were neglected as these places had higher concentration of SC's & ST's.
- Another example is the recent Kerala floods, where communities of Dalits received the aid much later than the other communities because of the areas they lived in.(marshlands)
- In Kadapra Mannar for instance, Dalit children living in an island cut off by a flooded marsh have to swim across and then wear their uniforms to go to school. There is no road available to reach the main road from their houses. For at least 6 months in a year the place is flooded.

- **Lack of concern for children** :- There is lack of concern by Government for the post traumatic stress disorders of children.
- Government fails to take adequate measures to overcome emotional & cultural problems of children.
- Many children get displaced from their families or lose them due to the disaster.
- Luckily there are many NGOs that help in the rehabilitation of these children.
- ✓ E.g. BSC (Behavioural Science Centre) post Gujarat Earthquake and World Vision India during the pandemic.

- **General Atrocities of backward castes** :- Those belonging to the Higher caste commit atrocities on Dalits and other lower castes people.
- ✓ Post the Tsunami of 2004, Dalits in Tamil Nadu were told to leave the relief camps. They were prevented from drinking water from the same tank. Even children belonging to the upper caste did not mix up with the Dalit children in temporary schools set up after the disaster.
- These trends have been observed not only in Tamil Nadu but other parts of the country, through various disasters.

- **Neglect of Women Rights** :- Women as a group are vulnerable to human rights exploitation & violation. In many cases , the public & private relief agencies fail to meet the needs of women such as-food, shelter, health & security. Lack of separate toilet and bathing facilities put the women at high risk of sexual harassment and exploitation.
- **Lack of Information** :- The marginalised groups such as backward caste people are unaware of the crucial information related to their rights towards claiming of relief & rehabilitation measures. Many are uneducated and are unable to access the relief and compensation provided by the government.
- **Harassment of victims who claim compensation** :- Many a times, there is a lack of concern shown by the Government officials towards the victims of the disaster. Lack of communication and adequate supervision leads to compensation & relief being given to people who are not affected by the disaster rather than those who are actually affected.

Humanitarian approach to resettlement and rehabilitation

Pratik singh

- ❖ **Humanitarian approach relates to the human rights approach relating to resettlement and rehabilitation of disaster victims.**
- ❖ **The United Nations, Major International Human Rights Agencies and NGO's identified significance of human rights concern towards disasters.**
- ❖ **These agencies hold the view that Human Rights Culture must be established Before, During and After a disaster.**
- ❖ **The International Covenant on Economic, Social and Cultural Rights (ICESCR) and the International Covenant on Civil and Political Rights (ICCPR) are two legally binding treaties that impose requirements to the Government of countries affected by disaster to fulfil their obligations to the economic, social, cultural, civil and political rights.**
- ❖ **Generally in Developing Countries Human Rights are at risk in Post-Disaster situations, United Nations have incorporated '*Guiding Principles on Internal Displacement*' that address '*Human Approach Relating to Disasters*'.**

Guiding Principles on Internal Displacement by United Nations

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graph TD; A[Guiding Principles on Internal Displacement by United Nations] --> B[Non-Discrimination]; A --> C[The Rights of Vulnerable Groups]; A --> D[The Right to Health]; A --> E[The Right to Housing]; A --> F[The Right to a Livelihood];
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Non-Discrimination

The Rights of Vulnerable Groups

The Right to Health

The Right to Housing

The Right to a Livelihood

□ Guiding Principles on Internal Displacement :-

- **1) No Discrimination :-** Although one should feel at least a sense of empathy when coming face to face with those who are suffering from the loss of their loved ones or dislocation from their home and community ties, yet there are countless instances of discrimination in provision and distribution of aid and recognition of human rights.
- Principle 4(1) of the guiding principles states “These Principles shall be applied without discrimination of any kind, such as race, colour, sex, language, religion, or belief, political or other opinion, national ethnic or social origin , legal or social status, age, disability, property, birth, or on any other similar criteria.”

- **2) Protection of Rights of Vulnerable Groups :-** Often the governments are first to respond to the demands of the powerful interest groups due to fear of loss in foreign and domestic investment. This causes them to lose focus from the socially and economically marginalised groups particularly the vulnerable groups like women, children, the elderly and those with disabilities and they fail to provide long term disaster relief and ensure implementation of human rights.
- Principle 4 (2) states “Certain internally displaced persons , such as children, especially unaccompanied minors, expectant mothers, mothers with young children, female heads of household, persons with disabilities and elderly persons, shall be entitled to protection and assistance required by their condition and to treatment which takes inot account their special needs.”

- **3)Consideration of –Right to Health :-** Post disaster many affected individuals suffer from PTSD (Post Traumatic Stress Disorder), run a great risk of depression and other mental illnesses due to loss of loved ones and displacement from home and community. In the developing countries, the regions getting affected by disaster face severe shortage of health services and personnel like doctors and nurses as well as poor sanitation facilities in the relief camps. Lack of potable water, overcrowding of relief camps and shelters also contribute to increasing the risk of spreading of disease.
- Principle 19 of the guiding principles states “All wounded and sick internally displaced persons as well as those with the disabilities shall receive to the fullest extent and with the least possible delay , the medical care and attention they require, without distinction on any grounds other than medical ones. When necessary, internally displaced persons shall have access to psychological and social services.”

Therefore, the governments are obliged to respect, protect and fulfil the right to health.

- **4) Consideration of-Right to Housing :-** There have been instances where there has been slow progress relating to housing and rehabilitation of the disaster victims. The problems range from searching for land deeds and titles after the personal and public records have been destroyed. The deliberate displacement of poor and disfavoured groups from desirable lands in favour of rich class and businessman. The survivors are forced to live without proper facilities and utilities and sometimes in overcrowded relief camps.
- Article 11(1) of the International Covenant on Economic, Social & Cultural Rights (**ICESCR**) states “The State Parties to the present Covenant recognise the right of everyone to an adequate standard of living for himself and his family, including adequate housing and to the continuous improvement of living conditions.”

- **5.Consideration of-Right to Livelihood** :- Those who make a living by fishing, work in small farms, micro units, and other unorganised sectors are deeply affected once disaster strikes. The disasters destroy and damage the facilities central to their livelihood such as damage to boats, production units etc. The process of resumption of activities for these people take a lot of time often several years.
- Article 6(1) of the ICESCR states “The State Parties to the present Covenant recognize the right to work, which includes the right of everyone the opportunity to gain his living by work, which he freely chooses or accepts, and will take appropriate steps to safeguard this right.”

NATIONAL DISASTER MANAGEMENT ACT 2005

- The Act lays down institutional , legal , financial and coordination mechanisms at National , State ,and Local levels .
- **National Disaster Management Authority :** The Act empowers the Central Government to appoint the National Disaster Management Authority with Prime Minister of India as the Chairperson .
- **National Executive Committee:** The National Executive Committee consisting of experts in the field of disaster management having practical experience of disaster management at the National ,State and District level . The committee is entrusted to prepare a national plan for disaster management .
- The National Authority is to recommend guidelines for the minimum standards of relief to be provided to persons affected by disaster like :
 - ✓ Minimum requirement to be provided in the relief camps .
 - ✓ Medical care and sanitation.
 - ✓ Special provisions to be made for widows and orphans.

Thank you