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FACULTY OF ENGINEERING AND
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Lecture-33

Natural disaster-part 1



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Natural disaster

- Disaster is an undesirable occurrence resulting from forces that are largely outside human control, strikes quickly with little or no warning, which causes or threatens serious disruption of life and property including death and injury to a large number of people, and therefore requires efforts in excess of that which are normally provided by statutory emergency services”.
- A disaster can be man-made such as war, Bhopal gas tragedy, nuclear disaster, etc. or can be natural like earthquake, wildfires, etc.

Natural and Man-Made Disasters



NATURAL DISASTER VS MAN MADE DISASTER

Natural disasters are caused by natural forces

Examples: tsunamis, floods, landslides, hurricanes, wildfires, droughts, volcanic eruptions, etc.

Steps can be taken to minimize the effects

Man made disasters are caused by the activities of men

Examples: hazardous material spills, explosions, chemical or biological attacks, etc.

Can be avoided with careful planning and prevention methods

- A natural disaster is an event caused by a natural hazard that can be defined as a “natural process or phenomenon that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage”. For e.g., an earthquake, cyclone, drought, etc.
- **Natural disasters** are catastrophic events that may have atmospheric, geological, and hydrological origins and causes fatalities, property damage and social environmental disruption.

NATURAL DISASTERS



Tornado



Flood



Wildfire



Earthquake



Drought



Tsunami



Landslide



Typhoon

Types of natural disasters

Classification of natural disaster: Natural disaster have been classified into six groups which are as follows

1. Geological or geophysical disaster:

- **Avalanches:** An avalanche or a snowslide is a rapid flow of snow or ice down a slope, such as a hill or mountain. It usually occur spontaneously.
- **Landslides:** A landslide is the downward or outward movement of soil and/or rocks in rapid or moderate speed from slopes under the influence of gravity.
- **Earthquakes:** Earthquake is the shaking and displacement of surface of the earth due to seismic activity.
- **Volcanic eruption:** Volcanic activity include transport of magma, rocks and gases from earth's interior to the earth surface which is followed by tremor and forceful eruption.
- **Sinkholes or subsidence:** It is a depression or hole formed in the ground. This occur due to collapse of the surface layer which in turn is induced by geological faulting, human activities, etc.



Avalanche



Sinkhole



Landslide



Volcanic eruption

2. Hydrological disasters

- **Floods:** A flood is an overflow of water that 'submerges' land.
- **Tsunami:** Also known as tidal wave. It is a series of waves in a water body caused by the displacement of a large volume of water, generally in an ocean or a large lake. Tsunamis can be caused by undersea earthquakes.
- **Limnic eruption:** A limnic eruption, also known as a lake overturn, occurs when a gas, usually CO₂, suddenly erupts from deep lake water, posing the threat of suffocating wildlife, livestock and humans. Such an eruption may also cause tsunamis in the lake as the rising gas displaces water.



Flood



Limnic eruption



Tsunami

3. Meteorological disasters

- **Tropical cyclones:** Tropical storms are among the most powerful natural disasters because of their size and destructive potential. A tropical storm forms over an ocean and is characterized by strong winds, heavy rainfall and thunderstorms.
- **Tornadoes:** Tornadoes are violent and dangerous rotating column of air in the form of condensation funnel, that remain in contact with the surface of the earth from its narrow end and often surrounded by clouds of debris and dust. Tornadoes strike without any warning and cause major destruction.
- **Blizzard:** Blizzards are severe winter storms characterized by heavy snow and strong winds.
- **Hailstorm:** Hailstorms are precipitation in the form of ice that does not melt before it hits the ground.
- **Thunderstorm:** Also known as lightning storm. It is characterized by lightning and its acoustic sound known as thunder. Thunderstorm is accompanied by strong winds and heavy rain.



Tornado

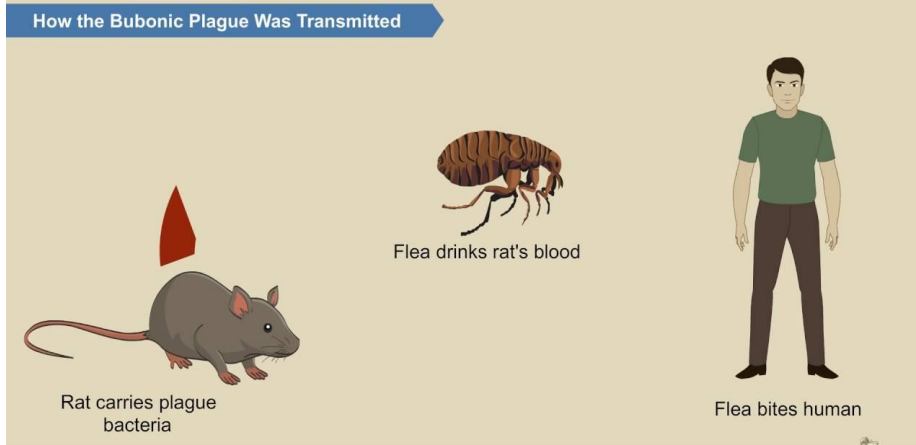
4. Climatological disasters

- **Cold waves:** Prolonged period of excessively cold weather or sudden flow of very cold air over a large area is called cold wave that along with frost affect agriculture, humans, animals as well as infrastructure.
- **Heat waves:** A heat wave is a period of unusually and excessively hot weather characterized by blowing hot winds.
- **Drought:** Drought is the condition of excess dryness of soil caused due to significantly low or no rainfall over a prolonged period. Hot and dry winds, shortage of water, high temperatures and consequent evaporation of moisture from the ground also aggravate conditions of drought.
- **Wildfires:** Wildfires are large fires which often start in wildland areas like forests, grasslands. The natural causes of wildfires are lightning and drought.



Wildfire

5. **Biological disasters:** It can be explained as a disaster caused due to exposure to living organisms such as pathogens and pests.
- **Epidemics:** A widespread occurrence of pathogenic diseases in a community at a particular area that may claim life on large scale.
 - **Pest infections:** Occurrence of pest or parasites that live on host and affect their lives.



6. Extra-terrestrial disasters:

- **Solar flare:** A solar flare is a phenomenon in which the Sun suddenly releases a much larger amount of solar radiation than normal. Solar flares are unlikely to cause any direct human injury but can destroy electrical equipment.
- **Meteorites and asteroids:** Asteroids that impact the Earth have led to several major extinction events. For e.g., extinction of the dinosaurs was occurred due to impact of asteroid on earth's surface.



Solar flare



Asteroids

Effects of natural disaster

The major effects of natural disaster include:

- Loss of life at large scale
- Damage to property
- Increase emotional stress
- Increase displacement
- Deteriorate economic status of individual
- Economic losses incurred at national level.
- Increased difficulties of survivors for existence
- Increased incidence of pathogenic diseases threatening with risk of another disaster.
- Increased deforestation and land degradation making affected area uninhabitable
- Loss of nation's infrastructure and impede progress
- Loss of biodiversity
- Loss of culture and tradition
- Severe damage or loss of historic monuments



