

## 12. DISASTERS AND THEIR MANAGEMENT

- 'Disaster' is defined as a crisis situation causing wide spread damage which far exceed our ability to recover.
- Disaster caused by human activities such as fire, accidents, epidemics as well as natural and may be equally devastating.
- When different natural resources are used, they are replenished naturally through biochemical cycles, food chains, food webs, and equilibrium is maintained in nature. This is called ecological balance.
- Disaster can be cause by humans (fire, accidents, industrial accidents or epidemics)as well as natural (flood, cyclone, earthquake, drought).



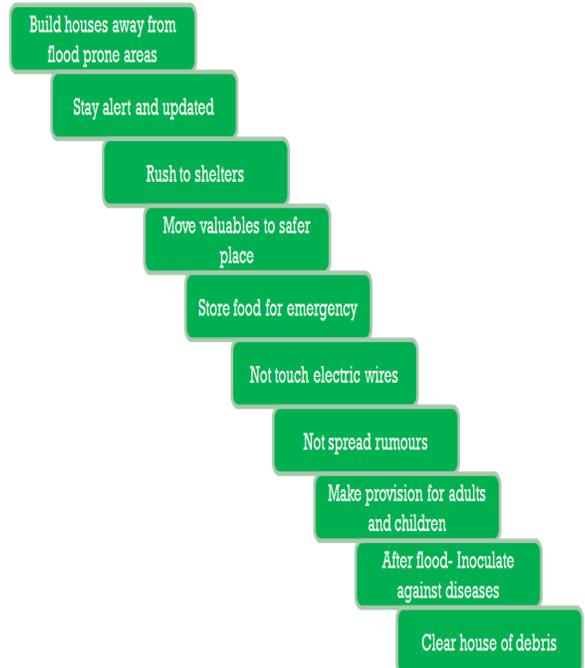
- Floods are caused by a variety of factors, both natural and man-made.
- Some obvious causes of floods are strong winds, heavy rains, melting snow and ice, dam burst and frequent storms within a short time duration.
- The common practice of humans to build homes and towns near rivers and other bodies of water (i.e., within natural floodplains) has contributed to the disastrous consequences of floods.
- **Effects of floods are as follows:**
  - Casualities
  - Structural damage
  - Material loss
  - Utilities damage
  - Crop loss
- The flood damage can be considerable reduced and loss of human lives can prevented through

proper planning of flood control and management measures.

- **Ways for Flood Control**

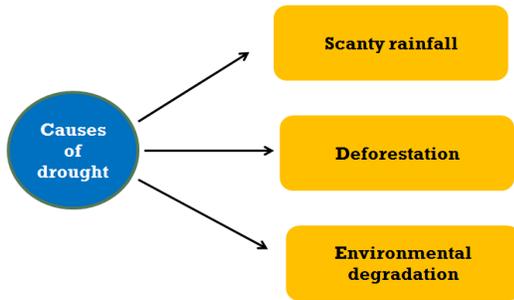
1. The first step is to keep the drainage system clean.
2. General clean-up of streets is also important.
3. Rain water harvesting system
4. Desilting
5. Inspection and repair of dams, levees, embankments etc
6. Aforestation helps in binding the loose soil
7. Local embankments around low-lying houses etc

- **Precautionary measures for flood**



- Drought is an event that results from lower than normal expected rainfall over a season or period.
- The low rainfall is insufficient to meet the needs of human beings, plants, animals and agriculture.

• **Causes of drought**



• **Effects of Drought as follows:**

- Crop failure leading to large scale starvation and death.
- Affected dairy activities, timber and fisheries,
- increase unemployment,
- Depletion of ground water, increasing energy consumption for pumping water from deep aquifers.
- Reduces energy production in hydro-electric power plants,
- Loss of biodiversity;
- and reduced landscape quality, causes health problems increased poverty;
- Reduced quality of life and
- Social unrest leading to migration.

• **Management of Drought**

- Rain water harvesting
- Reduce wastage
- Reuse waste water
- Reduce water consumption
- Efficient irrigation and sowing

- Earthquake is the result of a sudden release of energy in the earth's crust that creates seismic waves.
- In another words, a sudden rapid shaking to the earth caused by breaking and shifting if rocks beneath the earth's surface
- The first widely-used method, the Richter scale, was developed by Charles F. Richter in 1934.

Intensity on Richter Scale	Extent of damage
Upto 3	No damage
3-5	Cracks in old building
5-7	Cracks in roads
Above 8	Collapsing of buildings

• **Causes of Earthquake**

- Earthquakes are natural ways of releasing energy by earth.
- An earthquake occurs in certain pockets of the earth which has geological faults.
- Such areas have already been identified.

• **Effects of Earthquake**

- Collapsing of buildings
- Floods
- Landslides
- Tsunami
- Liquefaction

• **Management of Earthquake**



• **Precautionary Measures of Earthquake**



- Cyclone is violent storm and generally followed by heavy rains.

• **Causes of Cyclone**

Cyclone rotates around a low-pressure center. 'Eye' of the storm, which is well known for being eerily(harshly) calm compared with the areas under the spinning 'arms' of the storm

• **Effects of Cyclone**

- Wind and water penetrate building envelope

- Uplift of roof system
- Flying debris penetrate windows
- Storm surge
- Heavy precipitation in a short time
- Flash flooding
- Landslides (Mudflows)

• **Management of Cyclone**

- Identifying cyclone prone area
- Design building that can resist uplift
- Develop coastal green belt

• **Few of the long-term measures for cyclone**

- Construction of cyclone shelter
- Construction of canals and embankments for improved drainage
- Construction of missing road links
- Shelter belt plantation
- Institutional capacity building and hazard reduction studies
- Improvement of on shore warning system
- Awareness generation for cyclone risk mitigation

• **Tsunami (seismic sea wave/tidal wave/catastrophic ocean wave)**

- Underwater or coastal landslides or volcanic eruptions also may cause a tsunami.

• **Cause of Tsunami**

- Earthquake
- Landslides
- Plate's crush

• **Effects of Tsunami**

- Dead
- Destruction
- Poverty

• **Management of Tsunami**

- The mitigation measures are quite similar to those for cyclone or flood.
- Manmade or Anthropogenic hazards are those hazards caused directly or indirectly by human action or inaction.
- Fire is an event of burning something they are often destructive taking up toll of life and property.
- **Most common causes of house fires**



• **Management of Fire**

Management of fire	
Remember evacuation route	Handle inflammable material with care
Keep fire extinguisher	When out, shut electric and gas appliance
Keep matches away from children	Do not block access routes
In smoke, crawl on belly	Remove waste from house and office regularly
Hazardous material kept separately	Use firecrackers under supervision of elders
Do not plug several devices in one socket	Find at least two ways of escape

• **Road, rail and air traffic accidents**

(i) **Road accidents**

Road networks are developed for better connectivity and service. Increased number of vehicles violation of traffic rules, speeding, drunken driving and poor maintenance of vehicles as well as of roads are some of the main causes of road accidents.

(ii) **Rail Accident**

• **Causes**

- Human error
- Sabotage
- Fire
- Land slide
- Erosion of land

• **Safety Measures**

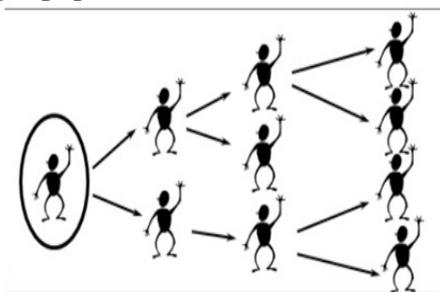
- At railway crossings pay attention to the signal and the swing barrier. Do not get underneath and try to get across.
- In case of an unmanned crossing, get down from the vehicle and look at either sides of the track before crossing.
- Do not stop the train on a bridge or tunnel where evacuation is not possible.
- Do not carry inflammable material in a train.
- Do not lean out of a moving train.
- Do not smoke in train.
- Do not pull the emergency cord unnecessarily.

(iii) **Air Accidents**

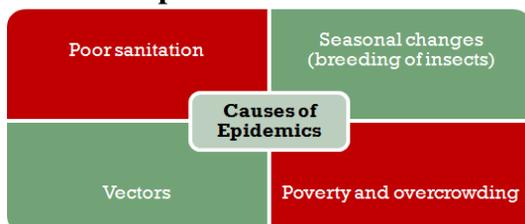
Air accidents may occur due to technical problems, fire, poor landing and take-off, weather conditions, hijacking, bombing etc

- Pay attention to the flight crew safety demonstration.

- Carefully read the safety card in the pocket.
- Know where the nearest emergency exit is and learn how to open it.
- Industrial accidents**  
Industrial accidents can be due to explosion, fire and leakage of toxic or hazardous chemicals and lead to heavy loss of life and material.
- Leakage of chemicals and explosion may be due to human error, technological failure or geological hazards like earthquakes, flood etc.
- The immediate effects include death or other symptoms like dizziness, headache, irritation etc. The long term effects may include cancer, heart failure, brain damage, dysfunction of immune system, deformation, genetic disorders or congenital (by birth) disorders in children.
- Management of Industrial accidents**
  - Inventory of hazardous chemicals
  - Location of industries
  - Community preparedness
  - Other measures
- Biological disasters**
  - Biological disaster is the devastating effects caused by an enormous spread of a certain kind of living organism – that may spread a disease, virus, or an epidemic.
  - Epidemic is an occurrence of illness or other health related event affecting a larger population



### Causes of Epidemics



- Pandemic disease:** An epidemic is when new cases of a given disease spread throughout a given population at a rate that is greater than would normally be expected.

#### Common Diseases

- Dengue
  - HIV and AIDS
- Disaster management essentially deals with management of resources and information towards a disastrous event and is measured by how efficiently, effectively and seamlessly one coordinates these resources.
  - Disaster management at the individual and organizational level deal with issues of planning, coordination, communication and risk assessment.
  - Community level Disaster Management**



- Government Initiatives on Disaster Management**
- National Committee on Disaster Management (NCDM) set up under Chairmanship of Prime Minister
- UNDP also support government initiatives Programme Components are:

- Development of state and district disaster management plan (DMP)
- Development of DMP and response plan at Village/Gram Panchayat, Block/Urban local body
- Constitution of Disaster management team (DMT) and committees at all level including women
- Capacity building of DMT including women
- Integration of DMPs with local development plans



### Check Yourself

1. Which place of India is affected in 2002 by earthquake?
  - a. Kashmir
  - b. Gujarat
  - c. Maharashtra
  - d. Uttarakhand
2. Flood warning is issued by:
  - a. CWC
  - b. IMD
  - c. NIDM
  - d. NDRF
3. Under water or coastal landslide or volcanic eruption may also cause:
  - a. Flood
  - b. Hurricane
  - c. Cyclone
  - d. Tsunami
4. Violation of traffic rules, over speeding, drunken driving and poor maintenance of vehicle are the cause of:
  - a. Air accident
  - b. Road accident
  - c. Rail accident
  - d. Ship accident
5. COVID 19 was an ----- disease.
  - a. Pandemic
  - b. Epidemic
  - c. Endemic
  - d. Fatal

Ans: 1.b. 2.a. 3.d. 4.b 5.a



### Stretch Yourself

1. Name the instrument which is used to measure intensity of earthquake?
2. What are the major ways to management of Tsunami?
3. How can fire accidents at home be prevented?
4. Who is the chairman of National Committee on Disaster Management?
5. Name the main component of disaster management.



### Test Yourself

1. What types of disasters are commonly occur in Indian subcontinent?
2. Differentiate between cyclone and Tsunami.
3. Mention the preventive measures to minimize the damage due to fire accident.
4. Describe common safety features for air accident.
5. Why do you think women should be part of any disaster management committee. Explain in brief.