ELCS 0045- DISASTER MANAGEMENT

LECTURE 1

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UNIT I
Introduction to Disasters

- A **disaster** is a serious disruption of the functioning of a community or society causing widespread human, material, economic, or environmental losses that exceed the ability of the affected community to cope using its own resources.

Example COVID-19, landsliding in Hanang, Earthquake in Bukoba etc.

Disaster in hanang 3rd Dec 2023



Generally, disaster has the following effects in the concerned Areas,

- It completely disrupts the normal day to day life
- It negatively influences the emergency systems
- Normal needs and processes like food, shelter, health, etc. are affected and deteriorate depending on the intensity and severity of the disaster
- Infrastructures like road, railway are damaged
- Loss of properties and life

Types of Disaster

Generally, disasters are of two types –

- **Natural** Disasters caused by natural processes of the earth. **these** are further classified into major/minor natural disaster
- **Man-made** Disasters caused by human activities. **These also classified as** major/minor man-made disasters.

NATURAL DISASTER

Major natural disasters:

- Flood
- Cyclone
- Drought
- Earthquake

Minor natural disasters:

- Thunderstorms
- Heat waves
- Mud slides
- Storm

MAN-MADE DISASTER

Major manmade disaster:

- Setting of fires
- Epidemic
- Deforestation
- Pollution due to cultivation
- Chemical pollution.
- Wars

Minor manmade disaster:

- Road / train accidents.
- Food poisoning
- Industrial disaster/ crisis
- Environmental pollution

Nature of Natural Disasters

Natural disasters are catastrophic events caused by natural forces of the earth that result in severe damage to life, property, and the environment.

Nature of Natural Disasters

- Unpredictable or partially predictable
- Large-scale destruction
- May occur suddenly or gradually
- Cause social and economic disruption
- Affect environment and development

Types and Effects of Natural Disasters

Floods

A flood occurs when water overflows onto normally dry land.

Causes

- Heavy rainfall
- River overflow
- Dam failure
- Poor drainage

Effects

- Loss of life and livestock
- Damage to houses and crops
- Spread of diseases
- Soil erosion
- Displacement of people

Control Measures

- Building dams and embankments
- Afforestation
- Proper drainage systems
- Flood forecasting

Drought

A drought is a prolonged period of insufficient rainfall leading to water shortage.

Causes

- Low rainfall
- Climate change
- Deforestation
- Overuse of water resources

Effects

- Crop failure
- Famine
- Water scarcity
- Migration
- Economic losses

Mitigation

- Rainwater harvesting
- Efficient irrigation
- Drought-resistant crops
- Water conservation

Cyclone

A cyclone is a powerful rotating storm with strong winds and heavy rain.

Causes

- Warm ocean waters
- Atmospheric disturbances

Effects

- Coastal flooding
- Destruction of buildings
- Loss of lives
- Damage to crops and infrastructure

Earthquakes

An earthquake is the sudden shaking of the earth's crust due to tectonic movement.

- **Causes**
- Movement of tectonic plates
- Volcanic activity
- Faulting

Effects

- Collapse of buildings
- Tsunamis
- Landslides
- Loss of life

Safety Measures

- Earthquake-resistant buildings
- Public awareness
- Emergency kits

Landslides

A landslide is the downward movement of rock, soil, or debris on slopes.

Causes

- Heavy rainfall
- Earthquakes
- Deforestation
- Mining activities

Effects

- Road blockage
- Property destruction
- Deaths and injuries

Prevention

- Afforestation
- Slope stabilization
- Proper drainage

Avalanches

- An avalanche is a rapid flow of snow down a mountain slope.

Causes

- Heavy snowfall
- Vibrations
- Temperature rise

Effects

- Burial of people and settlements
- Damage to transport routes

Prevention

- Avalanche forecasting
- Controlled explosions
- Restricting movement in danger zones

Volcanic Eruptions

- A volcanic eruption occurs when magma, ash, and gases escape from a volcano.

Effects

- Lava destruction
- Ash pollution
- Climate effects
- Loss of agriculture

Benefits

- Fertile soil
- Geothermal energy
- Mineral resources

Climatic Change

(a) Global Warming

- Global warming refers to the increase in Earth’s average temperature due to greenhouse gases.

Causes

- Burning fossil fuels
- Deforestation
- Industrial emissions

Effects

- Melting glaciers
- Extreme weather
- Sea level rise
- Biodiversity loss

Ozone Depletion

Reduction in the ozone layer caused mainly by chlorofluorocarbons (CFCs).

Effects

- Increased UV radiation
- Skin cancer
- Harm to plants and marine life

Prevention

- Use of eco-friendly products

Hazard

Hazard- is a dangerous phenomenon, substance, human activity, or condition that may cause:

- Loss of life
- Injury
- Property damage
- Social and economic disruption
- Environmental degradation

Vulnerability

Vulnerability- refers to the conditions that increase the exposure of a community to the impact of hazards.

Factors of Vulnerability

- Poverty
- Weak infrastructure
- Lack of awareness
- Poor health services
- Environmental degradation

Example

- People living in weak houses near rivers are more vulnerable to floods.

Resilience

- **Resilience** is the ability of individuals, communities, or systems to resist, absorb, adapt to, and recover from disasters effectively.

Characteristics of Resilience

- Preparedness
- Strong infrastructure
- Community cooperation
- Early warning systems
- Quick recovery mechanisms

Risk

Risk is the probability of harmful consequences resulting from the interaction between hazards and vulnerable conditions.

Risk Relationship

- Risk = *Hazard* × *Vulnerability*

Types of Risk

- Environmental risk
- Health risk
- Economic risk

Risk Assessment

Risk assessment is the process of identifying and analyzing possible dangers and their impacts.

Steps in Risk Assessment

- Identify hazards
- Analyze vulnerability
- Evaluate possible impacts
- Estimate level of risk
- Plan control measures

Man-Made Disasters

- When the disasters are due to carelessness of human or mishandling of dangerous equipment's they are called man-made disasters.
- Common examples of these disasters are train accidents, aero plane crashes, collapse of buildings, bridges, mines, tunnels, etc.
- Man-made disasters are the result of carelessness or human errors during technological and industrial use.

Man-Made Disasters

Nuclear Disasters

Disasters caused by leakage or explosion of radioactive materials from nuclear plants or weapons.

Causes

Nuclear reactor failure

Human error

Poor safety measures

Radiation leakage

Effects

- Radiation sickness
- Cancer and genetic disorders
- Environmental contamination
- Death of humans and animals

Chemical Disasters

Accidents involving dangerous chemicals released into the environment.

Causes

- Industrial explosions
- Gas leakage
- Unsafe chemical storage

Effects

- Poisoning
- Breathing problems
- Water and soil contamination
- Deaths and injuries

Building Fire

Fire outbreaks in homes, schools, offices, or industries.

Causes

- Electrical faults
- Gas explosions
- Carelessness with fire

Effects

- Loss of life
- Property destruction
- Smoke pollution

Prevention

- Fire extinguishers
- Emergency exits
- Fire alarms

Coal Fire

Underground or surface fires in coal mines.

Causes

- Spontaneous combustion
- Mining accidents

Effects

- Air pollution
- Land damage
- Health hazards

Forest Fire

Uncontrolled fire spreading through forests and vegetation.

Causes

- Human negligence
- Burning activities
- Cigarette disposal

Effects

- Destruction of wildlife
- Air pollution
- Soil damage

Prevention control and mitigation

Man-made disasters can be minimized to a large extent by adopting the following measures :

- Proper training of personnel working in the hazardous industries.
- Proper maintenance and care of safety measures.
- Removing human encroachments around hazardous industries.
- Making the people aware about the first-aid methods in case of accidents.
- Applying wet cloth over the mouth and nose in case of gas leakages minimizes the health hazards.
- Remaining indoors in case of radioactive accidents.
- Providing the people with proper medical care, in some cases throughout their life.

Self study

- Oil Fire
- Air Pollution
- Water Pollution

END