Module II

Environmental pollution

Disaster

2.12 Floods

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Disaster

It is defined as the geological process and it is an event concentrated in time and space in which a society or subdivision of a society undergoes severe danger and causes loss of its members and physical property. Natural calamities, of different types and intensities affect nations all over the world. Because of the large geographical size of the country, India often faces natural calamities like floods, cyclones and drought occurring fairly frequently in different parts of the country. At times, the same area is subjected to floods and drought situation in successive seasons or years. While not all natural calamities can be predicted and prevented, a state of preparedness and ability to respond quickly to a natural calamity can considerably mitigate loss of life and property and human suffering, and restore normalcy at the earliest. It is, therefore, of paramount importance that a plan of action for dealing with contingencies that arise in the wake of natural calamities is formulated and periodically updated.

Types

1. Natural disasters – refers to those disasters that are generated by natural phenomena
2. Man made disasters – refers to the disasters resulting from man-made hazards.

2.13Floods

Flood is a term used to denote an enormous amount of water. When there is an outflow of water in a place, it is said to be flooded. The situation caused when the water becomes uncontrollable is said to be flooded. The flood may take different forms such as in the form of heavy rainfall when there is a breaking of the dam. Furthermore, the melting of snow also leads to flooding. Floods lead to an overfull and huge spread of water but are not considered safe for the purpose of drinking. Thus floods bring with them a number of diseases such as typhoid, cholera and many others. Here, we shall discuss the various causes of floods.Whenever the magnitude of water flow exceeds the carrying capacity of the channel within its banks the excess of water overflows on the surroundings causes floods.

Causes of floods

1. Heavy rain, rainfall during cyclone causes floods
2. sudden snow melt also raises the quantity of water in streams and causes flood
3. sudden and excess release of impounded water behind dams
4. clearing of forests for agriculture has also increased severity of floods.

Flood management

1. Encroachment of flood ways should be banned
2. Building walls prevent spilling out the flood water over flood plains
3. Diverting excess water through channels or canals to areas like lake, rivers etc., where water is not sufficient,
4. Optical and microwave data from IRS is also used for flood management
5. Flood forecasts and flood warning are also given by the central water commission

2.14Cyclones

Cyclones are rapid inward air circulation around a low-pressure area. The air circulates in an anticlockwise direction in the Northern hemisphere and clockwise in the Southern hemisphere.Cyclones are usually accompanied by violent storms and bad weather.The word Cyclone is derived from the Greek word Cyclos meaning the coils of a snake. It was coined by Henry Peddington because the tropical storms in the Bay of Bengal and the Arabian Sea appear like coiled serpents of the sea.It is ameterological process, intense depressions forming over the open oceans and moving towards the land.

Effect:

1. The damage depends on the intensity of cyclone the damage to human life, crops, roads, transport, could be heavy

2. Cyclone occurance slow down the developmental activities of the area

Cyclone management:

1. Satellite images are used by meterological departments for forecasting the weather conditions which reveal the strength and intensity of the storm.
2. Radar system is used to detect the cyclone and is beign used for cyclone warning

Case studies

Cyclone in orissa – 1999

2.15 Land slides:

A **landslide** is the mass movement of rock, soil, and debris down a slope due to gravity. It occurs when the driving force is greater than the resisting force.It is a natural process that occurs in steep slopes. The movement may range from very slow to rapid. It can affect areas both near and far from the source.The movement of earthy materials like coherent rock, mud, soil and debris from higher to lower region to gravitational pull is called land sliedes

Causes:

1. Movement of heavy vehicles on the unstable sloppy regions create landslides
2. Earthquake, shocks, vibrations and cyclone create landslide

2.16 Earth quakes

An earthquake is a sudden movement of the Earth, caused by the abrupt release of strain that has accumulated over a long time. For hundreds of millions of years, the forces of plate tectonics have shaped the Earth as the huge plates that form the Earth's surface slowly move over, under, and past each other.An earthquake is an sudden vibration caused on earth surface with the sudden release of tremendous energy stored in rocks under the earth’s crust.

Causes:

1.Disequilibrium in any part of the earth crust

2. Underground Nuclear testing

3. Decrease of underground water level.

Effect:

Damage the settlements and transport systems

Collapses houses and their structures

Deformation of ground surface

Tsunami

Earthquake management:

Constructing earthquake resistant building Wooden houses are preferred Seismic hazard map should give the information about the magnitude of intensity of anticipated earthquakes.

2.17 Tsunami

A tsunami is a large wave that is generated in a water body when the seafloor is deformed by seismic activity. This activity displaces the overlying water in the ocean.

Causes of tsunami

1. Seismic activities like earthquakes, landslides, volcanic eruptions, explosions, can generate tsunami.
2. Deformation of the sea floor due to the movement of plates.

Concept of Tsunami

A tsunami is not a single wave but a series of waves like the ordinary waves which we see on a sea.

Effects on Tsunami

1. Tsunami attacks mostly the coastlines, causing devastating property, damage and loss of life

2. Tsunami can kill lot of human beings, livestock's, etc
3. Tsunami may also spread lot of water borne diseases.

Tsunami Management

Earthquakes under the water are monitored by sensors on the floor of the sea.

The sensors send the information of floating buoys on the surface, whenever they detect any changes in pressure of the sea

The information is then relayed to satellites, which passes it on to the earth stations.

Finally the country make the people alert through the media to take all necessary precautions.

Case studies:

Tsunami in India