Geography Unit-5

Hazards

Dear Students

Warm Greetings, now we are going to learn about – *Major Hazards in India*

1) Earthquakes

Earthquake is a violent tremor in the earth's crust, sending out a series of shock waves in all directions from its place of origin.

Earthquake prone regions of the country have been identified on the basis of scientific inputs relating to seismicity, earthquakes occurred in the past and tectonic setup of the region. Based on these inputs, Bureau of Indian Standards has grouped the country into four seismic zones:Zone II,Zone III,Zone IV and Zone V(No area of India is classified as Zone I).

2) Floods

Flood is an event in which a part of the earth's surface gets inundated. Heavy rainfall and large waves in seas are the common causes of flood.

The major causes of floods are:

A. Meteorological factors

i) Heavy rainfall
ii) Tropical cyclones
iii) Cloud burst

B. Physical factors

i) Large catchment area
ii) Inadequate drainage arrangement

C. Human factors

i) Deforestation
ii) Siltation
iii) Faulty agricultural practices
iv) Faulty irrigation practices
v) Collapse of dams
vi) Accelerated urbanization

The following map shows the major flood prone areas in India. Gangetic plains covering the states of Punjab, Haryana, Uttar Pradesh, North Bihar, West Bengal and Brahmaputra valley are the major flood prone areas in north and northeast India. Coastal Andhra Pradesh, Odisha and southern Gujarat are the other regions which are also prone to flood often.

3) Cyclonic Storms

A cyclonic storm is a strong wind circulating around a low pressure area in the atmosphere. It rotates in anti-clockwise direction in Northern Hemisphere and clockwise in the Southern Hemisphere.

Tropical cyclones are characterised by destructive winds, storm surges and exceptional levels of rainfall, which may cause flooding. Wind speed may reach upto 200 km/h and rainfall may record upto 50 cm/day for several consecutive days.

A sudden rise of seawater due to tropical cyclone is called storm surge. It is more common in the regions of shallow coastal water.

East coastal areas vulnerable to storm surges

- North Odisha and West Bengal coasts.
- Andhra Pradesh coast between Ongole and Machilipatnam.
- Tamil Nadu coast (among 13 coastal districts, Nagapattinam and Cuddalore districts are frequently affected).

West coastal areas vulnerable to storm surges

The west coast of India is less vulnerable to storm surges than the east coast.

- Maharashtra coast, north of Harnai and adjoining south Gujarat coast and the coastal belt around the Gulf of Cambay.
- The coastal belt around the Gulf of Kutch.

4) Droughts

Any lack of water to satisfy the normal needs of agriculture, livestock, industry or human population may be termed as a drought. Further, the drought could be classified into three major types as,

I. **Meteorological drought:** it is a situation where there is a reduction in rainfall for a specific period below a specific level.
II. **Hydrological drought:** it is associated with reduction of water in streams, rivers and reservoirs. It is of two types, a) Surface water drought, and b) Groundwater drought.
III. **Agricultural drought:** it refers to the condition in which the agricultural crops get affected due to lack of rainfall.

Droughts in India occur in the event of a failure of monsoon. Generally monsoon rainfall is uneven in India. Some areas receive heavy rainfall while other regions get moderate to low rainfall. The areas which experience low to very low rainfall are affected by drought.

The major areas highly prone to drought are:

1) The arid and semi-arid region from Ahmedabad to Kanpur on one side and from Kanpur to Jalandhar on the other.
2) The dry region lying in the leeward side of the Western Ghats.

5) Landslides

Landslide is a rapid downward movement of rock, soil and vegetation down the slope under the influence of gravity. Landslides are generally sudden and infrequent. Presence of steep slope and heavy rainfall are the major causes of landslides. Weak ground structure, deforestation, earthquakes, volcanic eruptions, mining, construction of roads and railways over the mountains are the other causes of landslides.

About 15% of India's landmass is prone to landslide hazard. Landslides are very common along the steep slopes of the Himalayas, the Western Ghats and along the river valleys. In Tamil Nadu, Kodaikanal (Dindigul district) and Ooty (The Nilgiris district) are frequently affected by landslides.

6) Tsunamis

Tsunami refers to huge ocean waves caused by an earthquake, landslide or volcanic eruption. It is generally noticed in the coastal regions and travel between 640 and 960 km/h. Tsunamis pose serious danger to the inhabitants of the coastal areas.

7) Hazardous Wastes

The wastes that may or tend to cause adverse health effects on the ecosystem and human beings are called hazardous wastes.

The following are the major hazardous wastes

I. **Radioactive substance:** tools and unused fuel rods of nuclear power plants.
II. **Chemicals:** synthetic organics, inorganic metals, salts, acids and bases, and flammables and explosives.
III. **Biomedical wastes:** hypodermic needles, bandages and outdated drugs.
IV. **Flammable wastes:** organic solvents, oils, plasticisers and organic sludges.
V. **Explosives:** the wastes resulting from ordnance manufacturing and some industrial gases.
VI. **Household hazardous wastes:** pesticides, waste oil, automobile battery and household battery.

8) Pollution of Air

Air is a mixture of several gases. The main gases are nitrogen (78.09%) for forming products such as, fertilisers for plants and for making the air inert, oxygen (20.95%) for breathing and carbon dioxide (0.03%) for photosynthesis. Some other gases like argon, neon, helium, krypton, hydrogen, ozone, zenon and methane are also present. Besides, water vapour and dust particles make their presence felt in one way or the other.

Air pollution is the contamination of the indoor or outdoor air by a range of gases and solids that modify its natural characteristics and percentage. Air pollutants can be categorized into primary and secondary pollutants.

- A **primary pollutant** is an air pollutant emitted directly from a source.
- A **secondary pollutant** is not directly emitted as such, but forms when other pollutants (primary pollutants) react in the atmosphere.

Primary Pollutants

i) Oxides of Sulphur
ii) Oxides of Nitrogen
iii) Oxides of Carbon
iv) Particulate Matter
v) Other Primary Pollutants

Secondary Pollutants

i) Ground Level Ozone
ii) Smog

9) Pollution of Water

Water pollution may be defined as alteration in the physical, chemical and biological characteristics of water, which may cause harmful effects in human and aquatic life.

In India, water pollution has been taking place on a large scale and since a long period. Both surface and groundwater bodies are polluted to a great extent. The major causes of water pollution in India are:

i) Urbanisation
ii) Industrial effluents
iii) Sewages
iv) Agricultural runoff and improper agricultural practices
v) Seawater intrusion
vi) Solid wastes

Need for Prevention

Measures

Prevention is defined as the activities taken to prevent a natural calamity or potential hazard from having harmful effects on either people or economic assets.

- Prevention planning consists of i) hazard identification, and ii) vulnerability assessment.
- Delayed actions may increase the economic losses.
- For developing countries like India, prevention is perhaps the most critical components in managing disasters.