

7. Natural Hazards and Disasters

1. Choose the right answer from the four alternatives given below

(i) Which one of the following states of India experiences floods frequently?

- (a) Bihar**
- (b) West Bengal**
- (c) Assam**
- (d) Uttar Pradesh**

Answer: (c) Assam

Note: Assam, West Bengal and Bihar are among the high flood-prone states of India and floods are almost annual features of these states.

(ii) In which one of the following districts of Uttarakhand did Malpa Landslide disaster take place?

- (a) Bageshwar**
- (b) Champawat**
- (c) Almora**
- (d) Pithoragarh**

Answer: (d) Pithoragarh

(iii) Which one of the following states receives floods in the winter months?

- (a) Assam**
- (b) West Bengal**
- (c) Kerala**
- (d) Tamil Nadu**

Answer: (d) Tamil Nadu

(iv) In which of the following rivers is the Majuli River Island situated?

- (a) Ganga**
- (b) Brahmaputra**
- (c) Godavari**
- (d) Indus**

Answer: (b) Brahmaputra

(v) Under which type of natural hazards do blizzards come?

- (a) Atmospheric**
- (b) Aquatic**
- (c) Terrestrial**
- (d) Biological**

Answer: (a) Atmospheric

2. Answer the following questions in less than 30 words.

(i) When can a hazard become a disaster?

Answer: Natural hazards are elements of circumstances in the natural environment that have the potential to cause harm to the people or property or both. As compared to natural hazards, natural disasters are relatively sudden and cause large scale, widespread death, loss of property and disturbance to social systems and life over which people have a little or no control.

(ii) Why are there more earthquakes in the Himalayas and in the north-eastern region of India?

Answer: The Himalayas comprise young fold mountain ranges. The Indian plate is moving towards the north and this movement of plates is being constantly obstructed by the Eurasian plate from the north. As a result of this, Indian and Eurasian plates are said to be locked with each other resulting in accumulation of energy at different points of time. Excessive accumulation of energy results in building up of stress and the sudden release of energy causes earthquakes along the Himalayan arch.

(iii) What are the basic requirements for the formation of a cyclone?

Answer: There are differences of opinion among scientists about the exact mechanism of a tropical cyclone. However, some initial conditions for the emergence of a tropical cyclone are:

- Large and continuous supply of warm and moist air
- Strong Coriolis force that can prevent filling of low pressure at the centre
- Unstable condition through the troposphere
- Absence of strong vertical wind wedge

(iv) How are the floods in Eastern India different from the ones in Western India?

Answer: Eastern states like Assam, West Bengal and Bihar are among the high flood-prone states of India due to the extreme precipitation. But the northern states like Punjab and Uttar

Pradesh are also vulnerable to occasional floods because of blocking of most of the streams and river channels of western India by human activities.

(v) Why are there more droughts in Central and

Western India?

Answer: Most parts of Rajasthan, Gujarat, Madhya Pradesh, eastern parts of Maharashtra, interior parts of Telangana and Karnataka Plateau, northern parts of interior Tamil Nadu and southern parts of Jharkhand and interior Odisha are drought prone area of India. These areas receive scanty rainfall and rainfall variability is very high. As a result the tanks, wells and similar underground water reserves remain unchanged.

3. Answer the following questions in not more than 125 words.

(i) Identify the Landslide-prone regions of India and suggest some measures to mitigate the disasters caused by these.

Answer: A landslide is a geological phenomenon that includes a wide range of ground movements. India has been divided into a number of zones.

- **Very High Vulnerability Zone:** This zone includes the areas in Himalayas, Andaman and Nicobar, steep and rainy slopes of the Western Ghats and Nilgiris, the northeastern states of India.
- **High Vulnerability Zone:** These areas have geographical conditions similar to those areas which have very high vulnerability. This zone includes all the Himalayan states and hilly areas of northeastern states. The intensity and frequency of landslides in these areas is less as compared to areas of very high vulnerability.
- **Moderate to Low Vulnerability Zone:** Landslides due to mining and subsidence are most common in states like Jharkhand, Odisha, Chhattisgarh, Madhya Pradesh, Maharashtra, Telangana, Andhra Pradesh, Karnataka, Tamil Nadu, Goa and Kerala.

Mitigation: Landslide mitigation refers to construction and other man-made activities on slopes with the goal of lessening the effect of landslides. It is always advisable to adopt area-specific measures to deal with landslides.

- Restriction on the construction of roads and dams, and agricultural activities in the areas of moderate slopes.
- Preventing water entering the hillside through open or discontinuity traction cracks.
- Large-scale afforestation programmes and construction of bunds to reduce the flow of water in the hilly areas.

- Terrace farming should be encouraged in the areas of Jhumming.

(ii) What is vulnerability? Divide India into natural disaster vulnerability zones based on droughts and suggest some mitigation measures.

Answer: Vulnerability is a concept that links the relationship that people have with their environment to social forces and institutions and the cultural values that sustain and contest them during to hazards and disasters. On the basis of severity of droughts, India can be divided into the following regions:

Extreme Drought Affected Areas: most parts of western Rajasthan and Rann of Kachchh region of Gujarat are areas of extreme drought.

Severe Drought Prone Area: This category of drought prone areas include parts of eastern Rajasthan, most parts of Madhya Pradesh, eastern parts of Maharashtra, interior parts of Telangana and Andhra Pradesh and Karnataka Plateau, northern parts of interior Tamil Nadu and southern parts of Jharkhand and interior Odisha.

Moderate Drought Affected Area: Northern parts of Rajasthan, Haryana, southern districts of Uttar Pradesh, the remaining parts of Gujarat, Maharashtra except Konkan, Jharkhand and Coimbatore plateau of Tamil Nadu and interior Karnataka are included in this category.

Drought mitigation measures:

- Immediate steps should be taken to provide safe drinking water, medicines, fodder of the people and their livestock.
- Rain water harvesting should be encouraged as far as possible.
- Various devices of remote sensing, satellite mapping and GIS may be used for identifying water aquifers.
- Afforestation retains water and helps in reducing the frequency and intensity of droughts.
- Drought resistant or rain fed crops should be grown in areas of deficient rainfall.

(v) When can developmental activities become the cause of disasters?

Answer: Developmental activities become the cause of disasters when such activities are carried on in the disaster prone areas without carrying the environmental conditions and severe consequences of such activities. For example development of large cities and port-towns like – Mumbai and Chennai along the coast, and touching the shore due to high land values, make them vulnerable to the occurrence of cyclones, hurricanes and tsunamis. The development activities in the landslide prone areas like the Himalayas and the Western Ghats can be harmful.

The construction activities in the river valley can lead to soil disturbance and flood. Sometimes, rivers also change their course causing floods and other calamities in the affected areas.