

## Natural & Man-made Disasters With Case Studies

### Exercises

#### A. Fill in the blanks

1. Some disasters like **droughts** may begin slowly and later increase in extent and intensity.
2. Earthquake is an example of a major **natural** disaster.
3. Cyclones are **low-pressure** areas that occur over warm ocean waters of temperate and tropical regions.
4. The **collision** of the earth's plates caused the earthquake in Nepal in April 2015.
5. The **Bhopal** gas tragedy was caused by the accidental leakage of a highly toxic gas called methyl isocyanate from the Union Carbide factory.

#### B. Match the following columns

A	B
1. Drought	a. Man-made disaster
2. Hiroshima bombing	b. Chemical disaster
3. Underwater earthquakes that cause tsunamis	c. Largest oil spill disaster
4. Accidental release of toxins into the environment from factories	d. Insufficient rainfall
5. Deepwater Horizon	e. Natural disaster

Answer:

A	B
1. Drought	d. Insufficient rainfall
2. Hiroshima bombing	a. Man-made disaster
3. Underwater earthquakes that cause tsunamis	e. Natural disaster
4. Accidental release of toxins into the environment from factories	b. Chemical disaster
5. Deepwater Horizon	c. Largest oil spill disaster

### C. Choose the correct answer

1. Droughts are caused by insufficient \_\_\_\_\_ over a long period of time.

1. flood
2. storm
3. **rainfall**
4. sunlight

2. In 1986, an accidental explosion at a nuclear plant at \_\_\_\_\_ in the former USSR caused radiation to spread across Ukraine and other regions, killing over 12,000 people.

1. Kiev
2. **Chernobyl**
3. Astana
4. St Petersburg

3. Chemical disasters are caused by \_\_\_\_\_.

1. **gases**
2. germs
3. pollen
4. virus

4. Biological disasters occur when \_\_\_\_\_, which are grown in laboratories, get released in the air.

1. chemical
2. **germs**
3. pollen
4. blossoms

**5.** Chemicals from \_\_\_\_\_ kill marine life and coral reefs and also affect birds and mammals.

1. cyclones
2. drought
3. earthquakes
4. **oil spills**

**D. State whether the following are true or false**

**1.** Earthquakes also trigger landslides, avalanches, and tsunamis.

**Answer.** True

**2.** Floods wash away the top layer of the soil, which is the most infertile.

**Answer.** False.

Floods wash away the top layer of the soil, which is the most fertile.

**3.** West Bengal is most vulnerable to floods.

**Answer.** False.

Bihar is most vulnerable to floods.

**4.** Oil spills harm marine life.

**Answer.** True.

**5.** The attacks carried out on Hiroshima and Nagasaki by the United States during World War II were an example of unintentional nuclear disaster.

**Answer.** False.

The attacks carried out on Hiroshima and Nagasaki by the United States during World War II were an example of intentional nuclear disaster.

**E. Answer the following questions in brief**

**Question 1.**

How are earthquakes caused ?

**Answer:**

The surface of the earth is made up of interlocking plates of rock that float on a semi-liquid layer called the mantle. When two floating plates collide, the vibrations pass through the , earth's surface or the crust. This makes the crust and everything on it shake uncontrollably and causes earthquake.

**Question 2.**

What causes floods ? What kind of environmental damage does a flood cause ?

**Answer:**

A flood occurs when a sudden influx of water submerges land, posing a danger to life and property. They are mostly caused due to overflowing of rivers in the monsoon. It occurs almost every year. Floods wash away the top layer of the soil which is the most fertile and hence causes soil erosion.

**Question 3.**

What is a drought ? What are the effects of a drought ?

**Answer:**

Droughts are caused when a region receives insufficient rainfall for a long period of time. Shortage of water in drought- prone areas leads to a fall in the water table, crop failure, shortage of food, fodder and employment. As people begin to starve, they migrate to other places and become homeless. It occurs almost every year bringing with them epidemics and causing human suffering.

**Question 4.**

What should people do in the event of a nuclear disaster ?

**Answer:**

In the event of a nuclear disaster, one should close all the doors and windows of their houses and remain indoors as radiation does not penetrate solid structures. People should not go out until the government makes arrangements for their rescue.

**Question 5.**

How do chemical disasters occur ?

**Answer:**

Chemical disasters occur by the accidental release of toxic chemicals or gases into the environment from factories or other establishments. The hazardous substances released into the environment travel very fast and cause large-scale devastation.

**Question 6.**

How do biological disasters occur?

**Answer:**

Biological disasters are caused by germs developed in laboratories and released in the air to kill a large number of people. When these microbes are inhaled by a person, or get absorbed in his/her system through a cut or wound, they can infect him/her . Even a few drops of the smallpox or plague virus could start an epidemic, killing thousands of people.

**Question 7.**

Give some examples of travel-related disaster.

**Answer:**

Some examples of travel-related disasters are air crashes, train collisions and

derailments, capsizing of boats and ships, etc. All these travel related disasters adversely impact a large number of people.

## **F. Answer the following questions in one or two paragraphs**

### **Question 1.**

Write a short note on the earthquake zones of India.

#### **Answer:**

The entire Himalayan belt is on the boundary between the Eurasian and the Indian plates and is, therefore, prone to earthquakes. It falls under the very high risk zone (Seismic Zone V). Because of frequent seismic activity, it cause severe damage to life and settlements in the area. Kachchh in Gujarat and the Ganga-Brahmaputra basin are in the high risk zone (Seismic Zone IV).

### **Question 2.**

How is a cyclone caused ? Which coastal region of India is cyclone-prone ?

#### **Answer:**

Cyclones are low-pressure areas that occur over warm ocean waters of temperate and tropical regions. Seen as swirling atmospheric disturbances they are accompanied by heavy rain, huge waves and powerful winds blowing at a velocity of 300 km per hour. Storm surges during the high tide, called storm tides, cause enormous damage to coastal regions. Cyclone-prone areas of India are West Bengal, Odisha, Andhra Pradesh and Tamil Nadu.

### **Question 3.**

What are the conditions people face during a drought ?

#### **Answer:**

Droughts are caused when a region receives insufficient rainfall for a long period of time. Shortage of water in drought- prone areas leads to a fall in the water table, crop failure, shortage of food, fodder and employment. As people begin to starve, they migrate to other places and become homeless. It occurs almost every year bringing with them epidemics and causing human suffering.

### **Question 4.**

Briefly explain the various causes of fire.

#### **Answer:**

Fires usually occur due to poor wiring and faulty electrical equipment, leakage of cooking gas or a carelessly thrown matchstick. The most common cause of a fire in a building is poor electrical wiring and faulty equipment. Electrical wiring must be regularly checked. If the wiring is worn-out, it must be replaced immediately by standard quality wires and electrical fittings to avoid any short-circuit. Fire can also be caused due to gas leakage. Gas pipes, regulators and stoves should be regularly checked to ensure there is no leakage. Regular maintenance checks in gas pipelines should also be mandatory. Fire is also commonly caused by carelessly thrown matches and cigarettes. It is also one of the common causes of

forest fires. There is also fire-related disasters in areas where wood is used in construction activities. The loss of life is more if a fire breaks out in crowded areas.

### **Question 5.**

Why is nuclear disaster so harmful?

#### **Answer:**

Nuclear weapons are weapons of mass destruction (WMD) and leads to mass destruction of life and property. The adverse effects of nuclear radiation through the use of these weapons leaves thousands of people crippled for life. Several thousands suffer throughout life due to exposure to radiation. A nuclear explosion is so bright that it can make people blind if they see it with naked eyes. The explosion is followed by a heat wave and a huge cloud formation at the blast site.

In such a disaster, radioactivity is the silent killer whose effects continue for a very long time after the incident. The energy released in the form of particles from the radioactive elements such as uranium, plutonium, etc. is called radioactivity. It spreads in the area and causes nausea, dizziness, vomiting and disorientation. It is very harmful to human health and causes serious illnesses like cancer. The worst type of man-made disaster, it can cause the collapse of social, political and economic establishments across the globe. Crises of this kind could occur intentionally as well as unintentionally.

### **Question 6.**

Which man-made nuclear disaster shook the world during World War II ? Give details.

#### **Answer:**

Man-made intentional nuclear disaster which shook the world during World War II was the attacks carried out on Hiroshima and Nagasaki of Japan by the United States in August 1945. The two atomic bombs dropped on Japan killed around one lakh people and injured an equal number. The two bombs were nicknamed 'Little Boy' and 'Fat Man'. It caused the collapse of social, political and economic establishments across the globe.

### **Question 7.**

Write a short note terror attacks attacks with examples.

#### **Answer:**

This kind of disaster occurs in the event of a terror strike, either through the use of explosives, guns, or chemical and biological weapons. Most of these disasters are brought about by misdirected elements who think that social, political, or religious goals can be achieved by killing people. Terrorists also hijack planes and destroy public infrastructure, such as railway tracks and bridges, to cause massive devastation. The attack on the World Trade Center in the US on 11 September 2001, when terrorists hijacked planes to spread terror, resulted in

nearly 3,000 deaths. The most destructive terror attacks in India include the attack on Parliament on 13 December 2001, and the Mumbai attacks on 26 November 2008.

### **Question 8.**

Write a short note on the Nepal earthquake of 2015.

#### **Answer:**

The Nepal earthquake was a devastating earthquake that struck near Kathmandu, the capital of Nepal on April 25, 2015. Nearly 9000 people were killed and several thousands more injured. The earthquake destroyed over 600,000 small and large buildings and structures in Kathmandu. The magnitude on Richter scale was 7.8 with two large aftershocks of magnitudes 6.6 and 6.7 within an hour of the main quake. The collision of earth's plates caused the earthquake in Nepal. Nepal lies on the fault called thrust fault. Where the Indian plate jumped over the Eurasian plate. The earthquake caused devastating damages to life and infrastructure and tremors were felt across India Bangladesh, Pakistan and Southwest China.

### **Question 9.**

What makes Bihar the most flood-prone state among all north Indian states ?

#### **Answer:**

Bihar is the most flood-prone state among all north Indian states because many of the rivers flowing through Bihar, such as the Kosi, Bagmati and Gandaki, flow through the high mountainous region of Nepal, before crossing very small distances and rapidly reaching the plains of Bihar, making them far more forceful. When it rains heavily in Nepal, the extra water enters these river channels and rushes into the plains of Bihar. As the rivers break their banks and overflow into the adjoining areas, large area of land and thousands of people and livestock are affected. More than 76% of the population in Northern Bihar live under the threat of floods every year.

### **G Picture study.**

#### **Question 1.**

Identify the type of disaster as shown in the picture.

#### **Answer:**

It is droughts lead to acute shortage of water and crop failure, resulting in people having to migrate to other places.

**Question 2.**

Is it man-made or natural?

**Answer:**

Its man made as well as natural as droughts are caused by shortage of rainfall and also due to deforestation, misuse of ground water, unscientific agricultural practices, etc.

**Question 3.**

What are the causes of this kind of disaster?

**Answer:**

Droughts are caused by shortage of rainfall and also due to deforestation, misuse of ground water, unscientific agricultural practices, etc.

**H. Map work**

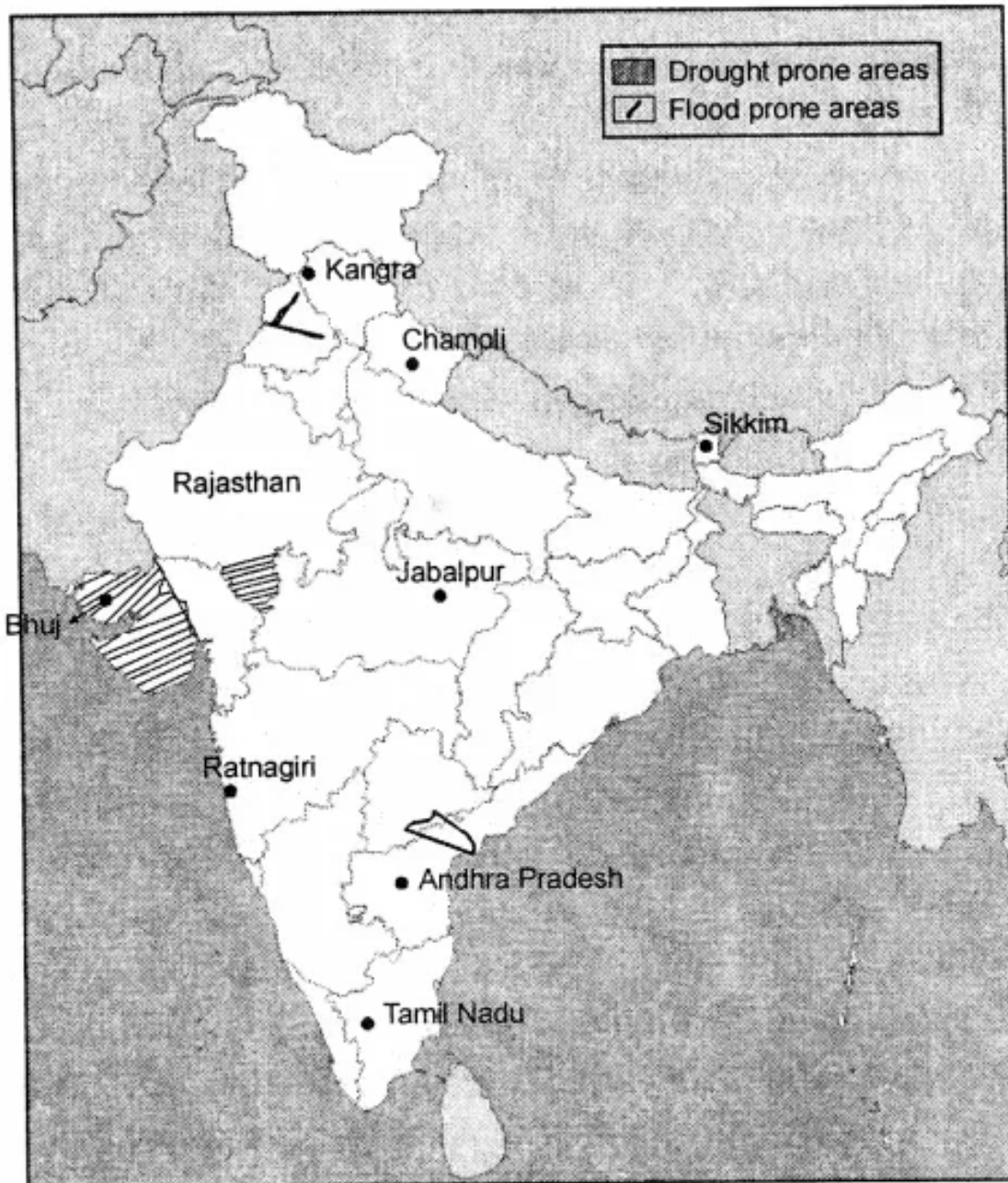
**On an outline map of India mark the following :**

1. Earthquake zones with moderate damage risk and high damage risk.
2. Any two flood-prone areas
3. Any two cyclone zones
4. Any two drought-prone areas

**Answer:**

1. **(a)** Earthquake zones with moderate damage risk are : Jabalpur, Ratnagiri.  
**(b)** Earthquake zones with high damage risk are : Chamoli, Sikkim.  
**(c)** Earthquake zones with very high damage risk are: Kangra, Bhuj.
2. Two floods prone areas are : Rivers of Punjab, River Krishna.
3. Two cyclones zone are : Andhra Pradesh and Tamil Nadu.
4. Two drought prone areas are : Gujarat and Rajasthan.





## Extra Questions

### Question 1.

What do you mean by disasters ? How are they classified?

#### Answer:

Disasters are incidents that cause significant physical damage or destruction to life and property or result in a drastic change in the environment.

#### Disasters can be broadly categorised into:

1. **Natural disasters** — It includes floods, cyclones, earthquakes and droughts that happen with natural forces and no human intervention.
2. **Man-made disasters** — It includes train accidents, plane crashes, nuclear or industrial accidents, biological disasters, terrorist attacks, use of weapons and mass destruction which are caused by human acts.

**Question 2.**

Which countries are more adversely affected by disasters? Why?

**Answer:**

Disasters affect people living in underdeveloped countries more adversely than those in developed countries because underdeveloped countries do not have proper disaster management systems in place.

**Question 3.**

What do you understand by natural disasters ?

**Answer:**

Natural disasters are events caused by natural forces that have major effects on the human population, infrastructure and biodiversity in an area. Earthquakes, floods, cyclones and droughts are some of the major natural disasters.

**Question 4.**

What is the difference between a hazard and a disaster ?

**Answer:**

Hazard means dangerous or risky natural phenomena that may lead to a disaster. Disaster is the incident that causes great damage and destruction of life, property and environment. For example, a cyclone near a coastline or the rising level of a river may be termed as a hazard because it could become a disaster for people living near it. A disaster usually causes death, injury, damage to infrastructure and property, loss of livelihood and environmental damage.

**Question 5.**

What is an earthquake? What are its effects ?

**Answer:**

An earthquake is a sudden, violent movement of a portion of the earth's crust caused by a disturbance under the earth's surface. At times, earthquakes take a heavy toll on life and property. Extensive damage is caused to houses, large buildings, bridges, dams, rail lines and power lines, communication networks etc. An earthquake can also act as a hazard by triggering landslides, avalanches and tsunamis.

**Question 6.**

Name the states worst affected by water scarcity in India.

**Answer:**

Rajasthan, Gujarat, Chhatisgarh, Madhya Pradesh, Maharashtra, Karnataka and Odisha.

**Question 7.**

What do you mean by man-made disasters ?

**Answer:**

Crises caused by a human act, intentionally or unintentionally are man-made disasters. The leakage of a hazardous gas from a chemical factory or fire in a restaurant can be classified under the unintentional man-made disaster whereas the effects of a planned nuclear explosion or a terrorist attack can be classified under the intentional man-made disaster.

**Question 8.**

What causes fire ? Give one example.

**Answer:**

Fire usually occur due to poor wiring and faulty electrical equipment, leakage of cooking gas or a carelessly thrown matchstick. One such incident was the Uphaar cinema hall tragedy in New Delhi on 13 July 1997.

**Question 9.**

Give an example of the intentional nuclear disaster and unintentional nuclear disaster.

**Answer:**

An example of intentional nuclear disaster is the attacks carried out on Hiroshima and Nagasaki cities in Japan by the United States during World War II. An example of unintentional nuclear disaster is an accidental explosion at a nuclear plant in Chernobyl in the former USSR in 1986 which caused radiation to spread across Ukraine and other regions. As many as 12,000 Ukrainians died in the chernobyl disaster.

**Question 10.**

Give an example of a chemical disaster.

**Answer:**

The Bhopal Gas Tragedy in Madhya Pradesh in 1984 is considered the world's worst industrial disaster. It was caused by the accidental leakage of a highly toxic gas called methyl isocyanate from the Union Carbide factory. It left 2,500 people dead and its effects continue to harm the future generations.

**Question 11.**

What are biological disasters ?

**Answer:**

Biological disasters are caused by germs developed in laboratories and released in the air to kill a large number of people. When these microbes are inhaled by a person, or get absorbed in his system through a cut or wound, they can infect him. Example — Even a few drops of the smallpox or plague virus could start an epidemic, killing thousands of people.

**Question 12.**

How and why are terror attacks carried out ? Give examples.

**Answer:**

Terror attacks occur in the form of a terror strike through the use of explosives, guns or chemical and biological weapons. Terrorists also hijack planes and destroy public infrastructure such as railway track and bridges to cause massive devastation. Most of the attacks are brought about by misdirected elements who think that social, political or religious goals can be achieved by killing people.

**For example :**

1. The attack on the World Trade Center in the US on 11 September 2001, when terrorists hijacked planes to spread terror, resulting in nearly 3000 deaths.
2. The terror attack on Parliament in India on 13 December 2001.
3. The Mumbai attacks on 26 November 2008.

**Question 13.**

Name the world's worst industrial disaster.

**Answer:**

The Bhopal Gas Tragedy.

**Question 14.**

What causes travel-related disasters ?

**Answer:**

Accidents during train, road and flight journeys are common. It becomes a disaster when a large number of people die. Most of such incidents occur due to equipment failure, loss of radar transmission in planes, or failure of brakes in buses, human error. Example : driver falling asleep while driving or missing a railway signal, fuel leakage or natural phenomenon like earthquake, storms or landslide.

**Question 15.**

How do oil spills occur ? What are its effect ?

**Answer:**

Oil spills occur when large quantities of oil are discharged into oceans or seas during drilling operations, cleaning of tankers and leaks from pipelines and storage tanks, an accident or explosion on a tanker or an offshore drilling rig. Most cases of oil spills are almost always a severe case of man-made disaster as they cause long term damage to the ocean and its marine life.

Effects — Some of the chemicals from the oil kill many forms of marine life and coral reefs. Other chemicals leave a residue black layer on the feathers of birds and the fur of mammals, causing them to die or drown. If an oil reaches the coast, it destroys fishing and tourism.

**Question 16.**

Which disaster is considered to be one of the worst spills to have happened in recent times ? Elaborate.

**Answer:**

The offshore Macondo oil rig called Deepwater Horizon had an explosion and tragically killed 11 workers besides injuring 16 more. Also known as the BP oil spill (since it was owned by British Petroleum), it is considered the largest spill in the history of the petroleum industry. An estimated 4.9 million barrels of oil was discharged into the water. The spill resulted in severe environmental, health and economic consequences. There was extensive damage to marine wildlife, fishing and tourism industries were adversely affected. The long term effects could be felt till 2013 and dolphins and other marine life continued to die in record numbers.

**Question 17.**

Name two state of India where floods cause massive damages every year.

**Answer:**

Assam and Bihar.

**Question 18.**

Name two wildlife sanctuaries of Assam.

**Answer:**

The Kaziranga National Park and the Pobitora Wildlife Sanctuary.

**Question 19.****Define —**

1. **Avalanche**
2. **Tsunami**
3. **Epidemic**
4. **Storm surge**
5. **Water table**

**Answer:**

1. **Avalanche** — It is a fall or slide of a large mass as of snow or rock, down a mountain side.
2. **Tsunami** — It is a long, high sea wave caused by an undersea earthquake or other disturbance.
3. **Epidemic** — It is an outbreak of a contagious disease that spreads rapidly and widely.
4. **Storm surge** — It is an abnormal rise in the level of the sea along a coast caused by the onshore winds of a severe cyclone.
5. **Water table** — It is the level below which the ground is saturated with water.

## 20. Fill in the blanks

1. **Disasters** are incidents that cause significant damage or destruction to life and property.
2. While most disasters happen suddenly like earthquake, nuclear explosion, others like **droughts** may have a slow beginning and later increase in extent and intensity.
3. Disasters affect people living in **underdeveloped** countries more adversely.
4. Earthquakes usually occur without **warning**.
5. An **earthquake** is a sudden violent movement of a portion of the earth's crust.
6. **Floods** are mostly caused due to the overflowing of rivers in the monsoon.
7. About **30** per cent of the land area in India is drought-prone.
8. **Droughts** lead to acute shortage of water and crop failure.
9. **Unintentional** nuclear disasters mostly occur due to accidents in nuclear power reactors.
10. The Bhopal Gas tragedy is an incident of **chemical** disaster.
11. The terror attack on Parliament of India took place on **13 December 2001**.
12. Nepal lies on the fault called **Thrust Fault**.
13. **Deep water horizon** explosion is the largest oil spill in the history of petroleum industry.
14. Heavy rainfall in Assam causes the **Brahmaputra** river and its tributaries to overflow.
15. **Bihar** is the most flood-prone region amongst the great northern plains of India with almost **73** per cent of the state affected by floods.