Natural Disasters - Public Awareness For Disaster Risk Reduction

Chapter Outline

8A68AL

Learning Objectives:

- *Define the terms – Disaster Risk Reduction, Resilience and Public Awareness.*
- *Understand the need for public awareness for disaster risk reduction.*
- *Explain the rules of actions for disasters.*
- *Learn and experience the various mock drills for disasters.*

8.1 Introduction

On an average, 232 million people are affected by different types of disasters every year. In recent years disaster risks have been on the rise due to factors such as population growth, unplanned urbanization, environmental degradation, conflicts and competition for scarce resources, climate change, diseases epidemics, poverty and pressure from development within high-risk zones. Hence, disaster risk reduction is the need of hour.

Recognizing the importance of Disaster Risk Reduction in 2005, 168 governments and all leading development and humanitarian actors signed the Hyogo Framework for Action (HFA), committing themselves to a ten-year multi-stakeholder and multi-sector plan to invest in disaster risk reduction as a means to building disaster-resilient societies.

Public awareness campaigns can be started modestly and tailored to meet the needs of specific populations and target groups. These approaches can

be integrated into almost all existing initiatives, whenever and wherever they take place. They can build on and support existing volunteer mobilisation and peer-to-peer communications. To support this, it requires strong and unified disaster reduction messages and clear and targeted information, education and communication materials.

8.2 Public awareness for disaster risk reduction

There are four key approaches to public awareness for disaster risk reduction: Campaigns, participatory learning, informal education, and formal school-based interventions.

Let's take formal school based interventions to learn in detail.

Formal school-based interventions: The focus of formal school-based interventions cover two areas: school disaster management and disaster risk reduction in school curricula. These are considered to be formal because accountability and responsibility for school safety and curricula belong exclusively to education authorities, so they require support for long-term planning and capacity building.

School disaster management: The primary goal of school disaster management are to ensure the safety of students and staff. Sustained school disaster management requires the familiar participatory and ongoing process of identification of hazards and risks, mitigation and reduction of risks, and developing response capacity.

A school disaster management plan, developed at the school level, should be the living document that expresses the awareness of public for disaster risk reduction. Every school has to setup the following school disaster committees:

1. Coordination Committees
2. Awareness generation Team
3. Search Rescue and Evacuation Team
4. Site safety Team
5. First Aid Team
6. Warning and Information Team
7. Bus safety Team
8. Water / Food Arrangement Team.

All the teams should participate in the mock drill.

Mock Drill means Practicing of something that can happen in future so that it can be easily dealt with in.

Mock drills

Mock drills form a vital part of the school disaster management process, and provide an intensive learning experience. They should be followed by reflection and assessment by all members of the school community. Lessons learned are incorporated into the school disaster management plan, and goals set for improvement next time. Depending on hazards faced, there are several major types of drills that can be practiced.

8.3 Disasters and Rules of actions during disasters

8.3.1 Earthquake

An Earthquake is sudden, rapid shaking of thesurface the earth due to the movements of the earth plates. This results as shifting

CASE STUDY

Nepal – India Earthquake

The **April 2015 Nepal Earthquake** (also known as the **Gorkha Earthquake**) killed nearly 9,000 people and injured nearly 22,000. It occurred on 25 April, with a magnitude of 8.1 Richter scale. Its epicentre was east of Gorkha District at Barpak. It was the worst natural disaster to strike Nepal since 1934 Nepal–Bihar earthquake.

The earthquake triggered an avalanche on Mount Everest, killing 21 people making April 25, 2015 the deadliest day on Nepal's history. The earthquake triggered another huge avalanche in the Langtang Valley, where 250 people were reported missing.

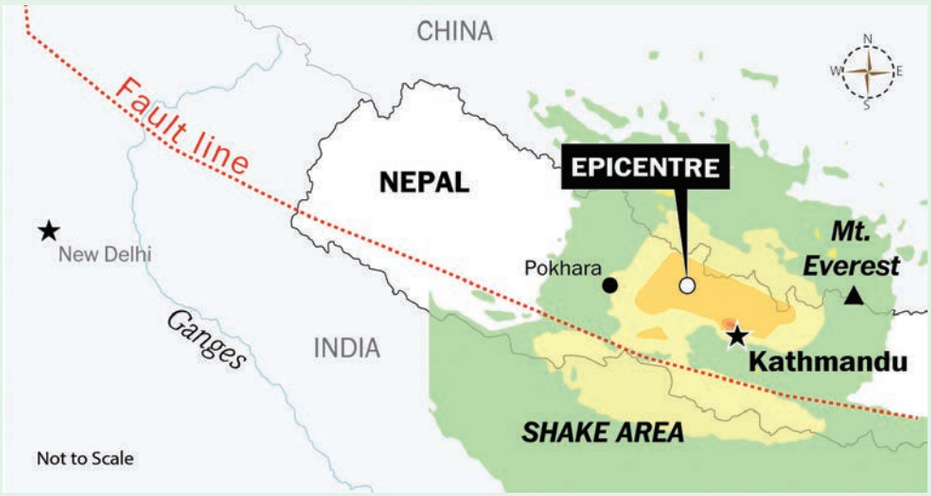

Figure 8.1. Nepal Earthquake, 2015

Students' activity

Mock drill: Earthquake.

In case we are inside the class when earthquake occurs, instruct loudly "earth quake position – drop, cover, and hold on". Drop down on your knee. Cover your head, neck and face. Go under a table to protect your head.

of the rock bolcks in the earth surface. Earthquakes strike suddenly without warning and can occur at anytime. The impacts of the earthquakes include deaths, injuries and damage of property.

Rules of actions during an earthquake:

1. Stay calm, do not panic.
2. If you are in a building, sit down on the floor under a table or any other furniture and firmly hold on to it until the earthquake has stopped.
3. If there is no table nearby, cover your face and head with your hands and sit on the floor in a corner of the room.
4. Keep away from glass windows, glass doors and things that can fall down.
5. Do not try to leave the building quickly; during earthquakes people mostly die because they try to run out of the

building and become trapped under ruins if the building is destroyed.

6. Do not go to the staircase, a balcony or an elevator.
7. If you are in the street, keep away from buildings; try to get into an open space and avoid power transmission lines.
8. If you are at home, turn off electrical equipments and gas quickly.
9. If you are in chemistry class or a laboratory where chemicals are stored, try to leave the room because chemicals may cause injuries;

After earthquake:

1. First check if you have any injuries, and then check the condition of the surrounding people.
2. After the earthquake when you leave the shelter, do not return for 2-3 hours because the quakes may repeat (an aftershock).
3. Check if there is fire; in case of a mild one try to extinguish it.
4. Be cautious about the possibility of gas leakage and damage caused to electrical wiring.
5. Be careful while opening wardrobe doors to take necessary items;
6. Use only lanterns; do not use an oil lamp or a candle.
7. Listen to the radio to receive information about the earthquake.

8.3.2 Landslide

A landslide is defined as the movement of a mass of rock debris down a slope. Landslides are caused by the direct influence of gravity. Landslides can be

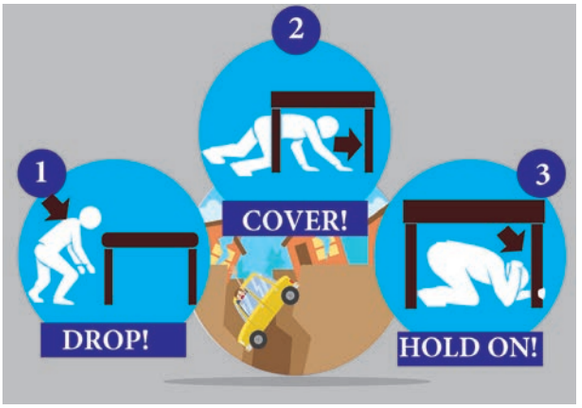

Figure 8.2. Drop, Cover, Hold-Mock drill

caused by rainfall, snowmelt, stream erosion, flood, earthquakes, volcanic activity, disturbance by human activities, or any combination of these factors.

Landslides cause property damage, injury and death and adversely affect a variety of resources. For example, water supplies, fisheries, sewage disposal systems, forests, dams and roadways can be affected.

During a Landslide

1. Listen for any unusual sounds that might indicate moving debris, such as trees cracking or boulders knocking together.
2. If you are near a river, be alert for any sudden increase or decrease in water flow and for a change from clear to muddy water. Such changes may indicate landslide activity upstream, so be prepared to move quickly.
3. Be alert especially when driving. Embankments along roadsides are particularly susceptible to landslides.
4. Disconnect the power supply in the areas of landslide.

After the Landslide

1. Stay away from the slide area. There may be danger of additional slides
2. Check for injured and trapped persons near the slide, without entering the direct slide area.
3. Direct rescuers to their locations.
4. Listen to local radio or television for the latest emergency information
5. Watch for flooding, which may occur after a landslide or debris flow.

8.3.3 Cyclone

The major natural disaster that affects the coastal regions of India is cyclone and as India has a coastline of 7516 km; it is exposed to nearly 10 percent of the world's tropical cyclones.

About 71 percent of flood prone areas are in ten states (Gujarat, Maharashtra, Goa, Karnataka, Kerala, Tamil Nadu, Pondicherry, Andhra Pradesh, Orissa and West Bengal). The islands of Andaman, Nicobar and Lakshadweep are also prone to cyclones.

Districts in Tamil Nadu which are frequently affected by cyclones: All the 13 coastal Districts of Tamil Nadu are affected by cyclonic storms which occur during May-June and in October-November months. These Districts are: Tiruvallur, Chennai, Kancheepuram, Villupuram, Cuddalore, Nagapattinam, Tiruvarur, Thanjavur, Pudukkottai, Ramanathapuram, Tuticorin, Tirunelveli and Kanniyakumari.

On an average, about five or six tropical cyclones form in the Bay of Bengal and Arabian sea and hit the coast every year. Out of these, two or three are severe.

When a cyclone approaches to the coast, a risk of serious loss or damage occurs from severe winds, heavy rainfall, storm surges and river floods. The effect of a storm surge is most pronounced in wide and shallow bays exposed to cyclones such as in the northern part of Bay of Bengal. Most cyclones occur in the Bay of Bengal

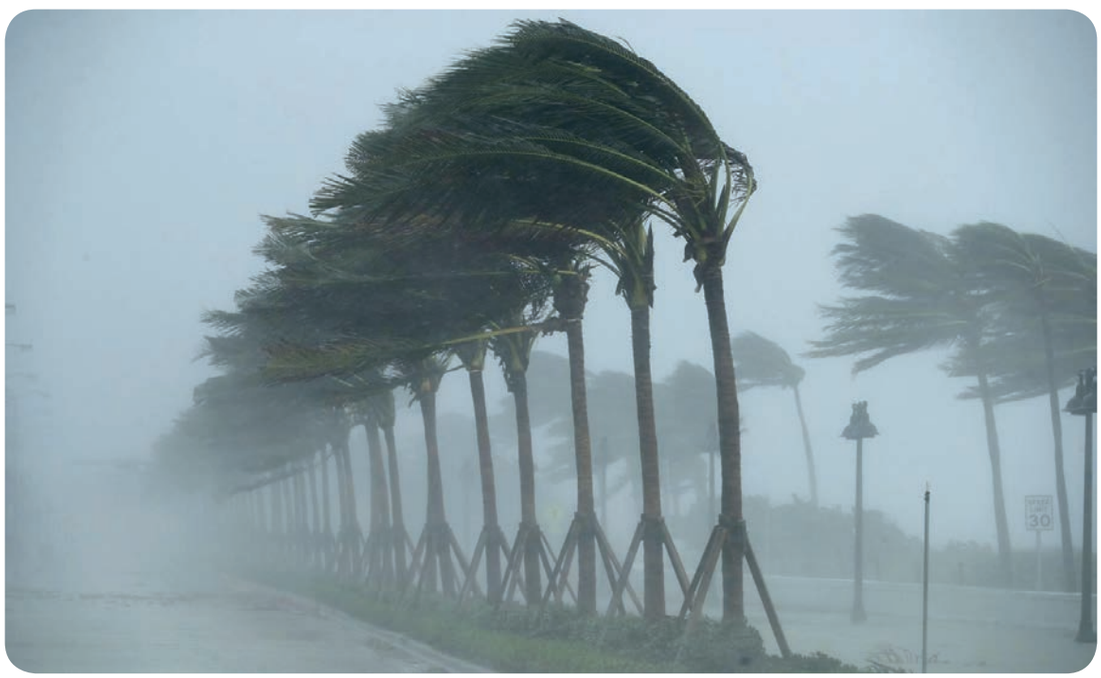

Figure 8.3. Forces of Cyclonic wind

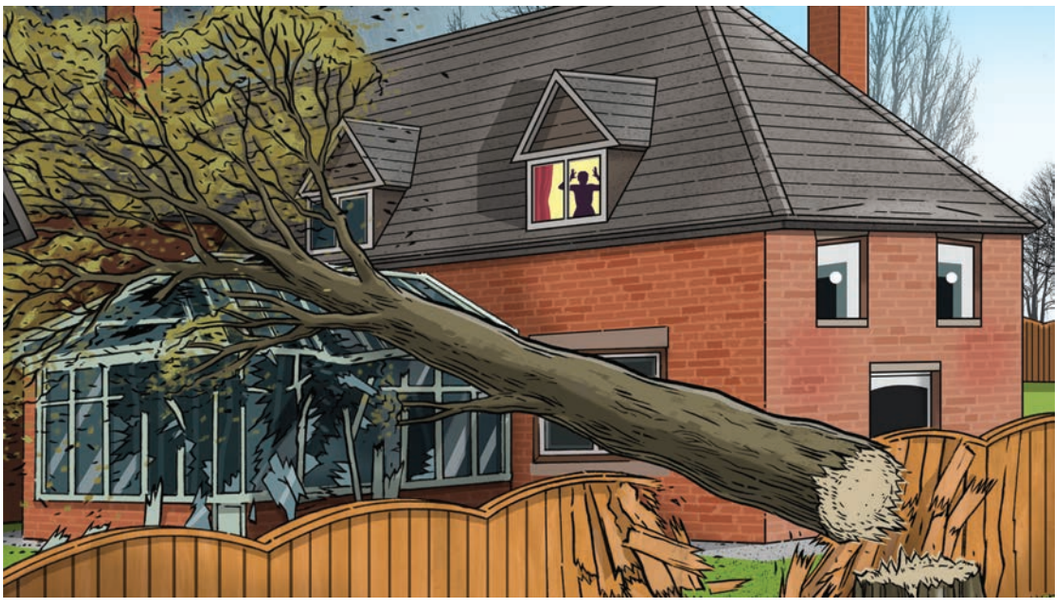

Figure 8.4. Effects of Cyclone

followed by those in the Arabian Sea and the ratio is approximately 4:1. During the cyclonic storms, wind speed is between 65 km/h to117 km/h.

Rules of action before a cyclone

1. Go to high-lying places from low-lying areas
2. Those residing in old buildings should temporarily relocate to safer buildings; Jewels and documents should be kept in safe custody.
3. Battery-operated radio, plastic torch-light, lamp, kerosene, match-box should be kept safely for future use.
4. Keep in ready all the first-aid kit and material available with you.
5. Keep in stock foodstuffs, material, fuel, drinking water and life-saving drugs needed for the next week.
6. It is also important to take cattle and other pets to safer places.
7. It is important to know that if we see quickly approaching storm clouds it is possible to predict strong winds several minutes in advance.

During a cyclone

1. If you are in a building during a strong gust, it is necessary to close and fasten windows and doors. It is better to stay in the rooms.
2. Turn off all electrical devices.
3. Protect yourself with your hands or a scarf. Protect the eyes, nose and mouth from dust.
4. If you are in a forest area, try to find a place protected from the wind. If there is no such place nearby, lie down on the ground.
5. If you are in a car it is better to stay there and close the windows. Do not park the car under unstable objects that can break down and fall on the car.

After cyclone

1. Turn off electricity, gas and water and unplug all electric appliances.
2. Beware of snakes and other animals immediately after the cyclone.
3. Do not go for sightseeing.

4. Stay away from damaged power lines, falling trees and flood water.
5. Boil and purify water before drinking.

8.3.4 Flood

Flood destructions have always brought miseries to numerous people, especially in rural areas. Flood results in the outbreak of serious epidemics, specially malaria and cholera. Simultaneously, scarcity of water also arises. It has a drastic effect on agricultural produce. Sometimes, water remains standing over large areas for long span of time hampering the Rabi crops.

India is one of the most flood prone country in the world. The principal reasons for flood lie in the very nature of natural ecological systems in this country, namely, the monsoon, the highly silted river systems and the steep highly erodible mountains, particularly those of the Himalayan ranges. The average rainfall in India is 1,150 mm with significant variation across the country. The annual rainfall along the western coast and the Western Ghats, Khasi hills and over most of the Brahmaputra valley amounts to more than 2,500 mm. Twenty-three of the states (29) and union territories (7) in the country are subject to floods and 40 million hectares of land, roughly one-eighth of the country's geographical area, is prone to floods. The National Flood Control Program was launched in the country in 1954.

Fact File

Tropical Cyclone Vardha hit Chennai on 12th December, 2016. National Disaster Management Authority (NDMA) reports that at least 10 people have died in Tamil Nadu.

Maximum sustained wind speeds of over 130 km/h was recorded, and the storm has caused severe damage to parts of the city of Chennai. Over 4,000 trees have been uprooted, power lines downed and buildings damaged.

NDRF teams clear up damage after Cyclone Vardha. Photo: NDRF

Do's before flood

1. Keep furniture and electrical appliances on beds and tables
2. Put sandbags in the toilet bowl and cover all drain holes to prevent sewage back flow.
3. Keep your mobile charged
4. Listen to radio or watch television for the latest weather bulletin and flood warnings.
5. Keep strong ropes, a lantern, battery operated torches, extra batteries ready.
6. Keep umbrellas and bamboo sticks with you.

8.3.5 Drought

Drought is a period of time (months or years) during which a part of the land has shortage of rain, causing severe damage to the soil, crops, animals, and people. It sometimes causes even death. During drought high temperature is experienced. Such conditions may affect our health.

The primary cause of drought is deficiency of rainfall and in particular, the timing, distribution and intensity.

In India around 68 percent of the country is prone to drought. Of the entire area 35 percent receives rain falls between 750 mm to 1,125 mm which is considered

Figure 8.6. Crops affected by Drought

Figure 8.7. Drought condition

drought prone while 33 percent areas receive rainfalls less than 750 mm is considered to be chronically drought prone.

Rules of action before, during and after Drought

Before drought:

1. Rainwater harvesting should be followed.
2. Sewage water should be recycled and used for domestic purpose.
3. Building canals or redirecting rivers for irrigation.
4. Utilise water economically.

During drought:

1. Wear cotton clothing and a hat.
2. In case of overheating, immediately move to a shady area.
3. Consume adequate amounts of water stay.

After drought:

1. If anyone faints after sunstroke, emergency medical measures should be taken.
2. Contact local government agencies to receive information about disaster and assistance for the population.

8.3.6 Lightning

Lightning is an atmospheric electrostatic discharge (spark) accompanied by thunder, which typically occurs during thunderstorms, and sometimes during volcanic eruptions or dust storms. Lightning generates 10-20 ampere current and it is therefore fatal. It is especially dangerous for people in an open area.

- You can hear thunder from about 16 km of its starting point.
- Lightning bolts travel at the speed of up to 80,000 km / second.
- The average length of a single lightning bolt is 3-4km.

Lightning strikes often have fatal consequences. On an average, 2000 people die from lightning in the world every year. Lightning mostly strikes tall things, such as trees that break down and catch fire or it may strike power transmission lines and antennas fastened on roofs and buildings which causing fire. The air temperature, when lightning occurs, is as hot as 9982.2 °C.

Thunder is the sound caused by lightning. A charged, superheated lightning bolt creates a "resonating tube" as it travels. The air in the tube rapidly expands and contracts causing vibrations that we hear as the rumble of thunder.

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Lightning strikes can explode a tree. Imagine 15 million volts of electricity hitting a tree branch. The heat travels through the tree, vaporizing its sap and creating steam that causes the trunk to explode.

- Lightning flashes more than 3 million times a day or 40 times a second worldwide.
- An average lightning bolt can release enough energy to operate a 100-watt light bulb for more than three months straight (about 250 kilowatt-hours of energy).

Before lightning

1. If you are planning to go to the countryside, check the weather forecast.
2. If a thunderstorm is expected it is better to postpone the trip.
3. It is good if you can estimate the distance to the front line of a thunderstorm. In order to do this you must check the time interval from the moment you see the lightning until you hear thunder. Lightning always precedes thunder. We know that the sound speed travels on average about 1km every 3 seconds. Reduction of the time interval between the sight of lightning and the resulting thunder means that the danger is approaching and protective measures must be taken. If there is no interval between lightning and thunder means, it means that the cloud is already over your head.

During Lightning:

1. If you are in a building it is necessary to close windows, doors, ventilation pipes and chimneys.

Figure 8.8. Lightning

2. It is necessary to turn off the telephone, TV set, and other electrical equipments because lightning may strike electrical cables and pass through wiring.
3. Do not take a shower because both water and metal conduct electricity.
4. Do not light the fireplace because the heat coming from the chimney may attract lightning.
5. It is better to stay away from electric wires, lightning rods, water pipes, antennas and windows.
6. If you are in an open area during a thunderstorm, do not stand under a tall tree. Lighting is most damaging for tall trees. It is better to stay 30-40 meters away from them. Avoid trees that are standing separately. Remember that lightning does not strike bushes.
7. If the area is open, it is better to find a lower place or a cavity and squat there. It is dangerous to stand or lie down on the ground, because this increases the exposure area.
8. It is necessary to get rid of metal items such as a bicycle, coins etc.
9. Do not stand under an umbrella.
10. Do not run during the occurrence of lightning; move slowly towards a shelter because the air flow may attract lightning;
11. If you are in a car, do not get out. It is better to close the windows and turn of the antenna. Do not park your car under tall trees or any structures that may fall down and hit you.
12. If there is an injured person next to you, remember that the victim may lose consciousness. It is necessary to provide first aid.
13. Cover your mouth with a wet cloth in order to protect your lungs.

Student activity

Read the following rules for lightning and practice the mock drill as given below.

1. Follow the 30/30 rule.
2. If there are less than 30 seconds between thunder and lightning, you are in danger.
3. Get inside and stay there until 30 minutes after the last lightning flash.
4. practice lightning crouch
5. If you see or feel lightning and there is nowhere to go for shelter, immediately squat down.
6. Balance on the balls of your feet, touch your heels together.
7. Cover your ears.
8. This way the charge may go through your back in to the ground without harming your vital organs.

GLOSSARY

1. **Disaster**: A serious disruption of the functioning of a society involving human, and material, and impacts that exceed the ability of the affected society to cope using its own resources.
2. **Disaster risk reduction**: The practice of reducing disaster risks through systematic efforts to analyze and manage the causal factors of disasters.
3. **Mitigation** : The lessening of the adverse impacts of hazards and related disasters
4. **Preparedness**: The capacity developed by organizations, to effectively anticipate, respond to, and recovers from the impacts of disaster events.
5. **Prevention**: The outright avoidance of adverse impacts of hazards and related disasters.
6. **Public awareness:** The extent of common knowledge about disaster risks, the factors that lead to disasters and the actions that can be taken, to reduce vulnerability to hazards.
7. **Resilience**: The ability of a society exposed to hazards to resist, absorb, adapt to and recover from the effects of a disaster.
8. **Hyogo Framework for Action** – A global blueprint for disaster risk reduction efforts between 2005 to 2015 – by providing specific operational guidance for promoting disaster risk reduction.

Evaluation

I Choose the best answer from the given below.

1. On an average _____ million people are affected by different types of disasters every year.
   a) 423 b) 232
   c) 322 d) 332
2. The Hyogo Frame work for Action (HFA) was signed by the 168 governments and other actors in _____
   a) 2006 b) 2008
   c) 2005 d) 2002
3. There are _____ key approaches to public awareness for disaster risk reduction
   a) 8 b) 6
   c) 9 d) 4
4. 33 percent of total areas in India which receives rainfalls less than -------- is considered to be chronically drought prone.
   a) 650 mm b) 750 mm
   c) 850 mm d) 950 mm
5. It is important to practice Drop, Cover, Hold for
   a) Fire b) Earthquake
   c) Lightning d) Flood
6. One among the given occurs mostly in the slope of high lands
   a) Earthquake b) Flood
   c) Landslide d) Lightning
7. When lightning occurs, the air temperature is
   a) 9982.2 ^{0}C b) 8892. 2 ^{0}C
   c) 9892. 2 ^{0}C d) 9899.2^{0}C
8. If there are less than _____ between thunder and lightning, you are in danger.
   a) 40 sec b) 60 sec
   c) 50 sec d) 30 sec
9. India is exposed to nearly _____ % of world's tropical cyclone.
   a) 10 b) 20
   c) 30 d) 40
10. During disaster consider the most appropriate from the given below.
   a. Think that the life is more valuable
   b. Think that things are more valuable.
   c. Think that life and things are equally valuable
   d. Think that life is less valuable than things.

II. Give a short note on

11. Public awareness for disaster risk reduction.
12. Hyogo Frame work for Action (HFA)
13. What are the causes of landslide
14. 30/30 rule for lightning.
15. Drought.

III. Write the short answer

16. Mention any three rules of action for landslide.
17. Write the rules of action before drought.
18. What are the rules of action after cyclone?
19. Name the districts of Tamil Nadu vulnerable to frequent cyclone.

IV. Write in detail

20. Write any three Do's and Don'ts for earthquake.
21. Describe the ways and means of how to protect ourselves from lightning and thunder.
22. Explain the rules of action during landslide.

V. Mock drill exercise

1. Prepare a school disaster management plan focusing on the following mock drills that can be scheduled to be conducted by the various committees.
2. Drop, cover, hold mock drill for earthquake
3. Mock drill for lightning.

VI. Group discussion

1. Discuss in group how you can manage drought condition before it occurs.

Reference

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2. Towards a culture of safety and resilience, UNICEF.
3. Teachers Guide on Disaster, TNSCERT.
4. Children's action for disaster risk reduction, UNISDR