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NATURAL CALAMITIES AND DISASTER MANAGEMENT

NATURAL CALAMITIES AND DISASTER MANAGEMENT:

Disaster is a very common phenomenon in the human society. It has been experienced by people since time immemorial. Though its form may be varied, it has been a challenge for society. The latest development which has been discovered in the World Disaster Reports recently is that, the disasters have increased in frequency and intensity. India is one of the most disaster-prone countries in the world. It has some of the world's most severe droughts, famines, cyclones, earthquakes, chemical disasters, rail accidents and road accidents. The high density of population in the developing countries, especially in the high risk coastal areas, results in millions of people getting affected by natural disasters, especially in recurring disasters like floods, cyclones, storm surges, etc.

Disaster

'A disaster is a serious disruption of the functioning of a society involving human and material loss. Disaster is broadly classified into natural and manmade disasters.

1. Earthquake

An earthquake is sudden, rapid shaking of the ground caused by the shifting of rocks beneath the earth's surface. The duration of the earthquake may be a few seconds to some minutes. The point where an earthquake originates is called its 'focus'. The vertical point at the surface from the focus is called 'epicenter' and the damage caused by the earthquake is the highest near the epicenter. Earthquakes strike suddenly without warning and can occur at any time. The impacts of the earthquakes include deaths, injuries and damage of property. The earthquake is measured by an instrument called a Seismograph. It is recorded in Richter scale.

What to do during an earthquake?

Be aware that some earthquakes are actually foreshocks and a larger earthquake might occur later. Minimize your movements to a few steps that reach a safe place nearby and stay indoors until the shaking has stopped and you are sure exiting is safe.

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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 equipment 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;
10. Stop as quickly as safety permits. Avoid stopping near or under buildings, trees, overpasses and utility wires.
11. Proceed cautiously once the earthquake has stopped. Avoid roads, bridges or ramps that might have been damaged by the earthquake.
12. Move away from buildings, trees, streetlights and utility wires.
13. If you are in open space, stay there until the shaking stops. The greatest danger exists directly outside buildings at exits and alongside exterior walls. Most earthquake-related casualties result due to collapsing walls, flying glass and falling objects.

After earthquake:

1. First check if you have any injuries, and then check the condition of the surrounding people. If you cannot do this, wait for the rescue team;
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.

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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.

2.Tsunami

Tsunami are waves generated by earthquake, volcanic eruptions and underwater landslides. A tsunami can kill or injure people and damage or destroy buildings and infrastructure as waves come forth and recede. A tsunami is a series of enormous ocean waves caused by earthquakes, underwater landslides, volcanic eruptions or asteroids. Tsunamis can travel 700-800 km per hour, with waves 10-30 meter high. It causes flooding and disrupts transportation, power, communications, and water supply.

How to respond to Tsunami?

1. You should find out if your home, school, workplace or other frequently visited locations are in tsunami hazard areas along the sea-shore. Know the height of your street above sea level.
2. Plan evacuation routes from your home, school, workplace, or any other place you could be, where tsunamis pose a risk.
3. Discuss tsunamis with your family. Review safety and preparedness measures with your family. Be aware facts about tsunami.
4. Use a weather radio or stay tuned to a local radio or television station to keep informed of local watches and warnings.
5. Discuss tsunamis with your family. Everyone should be aware of what to do when tsunami strikes. Discussing tsunamis ahead of time will help reduce fear and save precious time in an emergency. Review flood safety and precautionary measures with your family.
6. You should find out if your home, school etc., are in vulnerable areas along sea shore.
7. Don't go to the coast to watch the Tsunami. Don't try to surf the tsunami waves.

What to do after a Tsunami?

1. You should continue using a weather radio or staying tuned to a Coast Guard emergency frequency station or a local radio or television station for updated emergency information.
2. Check yourself for injuries and get first aid if necessary, before helping injured or trapped persons.
3. If someone needs to be rescued, call professionals with the right equipment to help.
4. Help people who require special assistance, like Infants, elderly people, those without transportation, large families who may need additional help in an emergency situation, people with disabilities, and the people who care for them.
5. Stay out of a building if water remains around it. Tsunami water, like floodwater, can undermine foundations, causing buildings to sink, floors to crack, or walls to collapse.
6. Check for gas leaks. If you smell gas or hear a blowing or hissing noise, open a window and get everyone outside quickly.

Tsunami and floods

A killer Tsunami hit the south east Asian countries on the 26th of December, 2004. A massive earthquake with a magnitude of 9.1 -9.3 in the Richter scale epicentre in the Indonesian island of Sumatra. It triggered one of the biggest Tsunamis the world had ever witnessed. The massive waves measuring up to 30metres that killed more than 2,00,000 people of Asia. In India, over 10,000 people were killed by this disaster. Tamil Nadu alone accounted for 1,705 deaths. All the coastal districts were affected, Nagapattinam was the worst hit in the state of Tamil Nadu. Fishermen, tourists, morning walkers, children playing in beach and people living on the coast were unprepared for the waves. So, they lost their life and the most of the loss of lives and damage to property was within 500 metres of the shore. After that the Indian government set up a Tsunami Early Warning System at Indian National Centre for Ocean Information Services (INCOIS), Hyderabad in 2007.

3.Cyclones:

A low-pressure area which is encircled by high-pressure wind is called a cyclone. The major natural disaster that affects the coastal regions of India is cyclone and as India has a coastline of about 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.

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 wildlife 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.

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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.

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 Kanyakumari. 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 followed by those in the Arabian Sea and the ratio is approximately 4:1. During the cyclonic of cyclonic storms, wind speed is between 65 km/h and 117 km/h.

4.Flood

Floods are high stream flows, which overlap natural or artificial banks of a river or a stream and are markedly higher than the usual flow as well as inundation of low land. 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 countries 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.

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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 (6) 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.

Types of floods

Flash floods: Such floods that occur within six hours during heavy rainfall.

River floods: Such floods are caused by Precipitation over large catchment areas or by melting of snow or sometimes both.

Coastal floods: Sometimes floods are associated with cyclone high tides and tsunami.

Causes of floods

1. Torrential Rainfall.
2. Encroachment of rivers bank.
3. Excessive rainfall in catchment.
4. Inefficient engineering design in the construction of embankments, dams and canals.

Effects of floods

1. Destruction of drainage system
2. Water pollution
3. Soil erosion
4. Stagnation of water
5. Loss of agricultural land and cattle
6. Loss of life and spread of contagious diseases.

During floods

1. Cut off gas connection and electricity.
2. Keep sand bags on drainage holes and bathroom holes.
3. Leave immediately through the known passage or prescribed passage
4. Drink hot water.

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5. Use bleaching powder to keep your environment hygienic.
 6. Before using match sticks and candles, ensure that there is no gas leakage.
 7. Don't eat more food when you are affected by diarrhoea.
 8. Don't try to take anything that floats in flood.

Do's before flood

1. Keep furniture and electrical appliances on beds and tables, to find out if the settlement area is to be affected by flood or not.
2. Put sandbags in the toilet bowl and cover all drain holes to prevent sewage back flow. Keeping radio, torch and additional batteries, storing drinking water, dry foods items, salt and sugar. Safeguarding materials like kerosene, candle, match box, clothes and valuable things.
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 for protection from snakes.
7. Keeping umbrella and bamboo poles, ³/₄ Keeping first aid box and strong ropes to bind things, ³/₄ to dig canals from the farm land, to drain the excessive water keeping sand bags etc.,

Don'ts

1. Try to connect electricity once it is cut.
2. Operate vehicles
3. Swim against floods
4. Avoid going on excursions. Neglect flood warning messages

5.Landslide

The movement of a mass of rocks, debris, soil etc., downslope is called a 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 caused by rainfall, snowmelt, stream erosion, and flood, earthquakes, volcanic activity, disturbance by human activities, or any combination of these factors.

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Landslides causes:

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.

6.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.

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

Rules of action before, during and after 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. Utilize 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.

7.Thunder and lightning

Thunder is a series of sudden electrical discharge resulting from atmospheric conditions. This discharge results in sudden flashes of light and trembling sound waves which are commonly known as thunder and lightning.

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. Lightning strikes often have fatal consequences. On an average, 2000 people die from lightning in the world every year.

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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. 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.

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.
2. It is necessary to turn off the telephone, TV set, and other electrical equipment 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.

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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.

Disaster Risk Reduction (DRR)

Disaster Risk Reduction: The practice of reducing disaster risks through systematic efforts to analyze and manage the causal factors of disasters. There are four key approaches to public awareness for disaster risk reduction.

1. Campaigns,
2. Participatory learning,
3. Informal education, and
4. Formal school-based interventions.

Forecasting and Early Warning

Weather forecasting, Tsunami early warning system, cyclonic forecasting and warning provide necessary information which help in reducing risks during disasters. School Disaster Management Committee, Village Disaster Management Committee, State and Central government institutions take mitigation measures together during disaster. Newspaper, Radio, Television and social media bring updated information and give alerts on the vulnerable area, risk, preparatory measures and relief measures including medicine.

Questions:

1. Disaster played major role in recent past in our earth. In this statement what is meant by disaster explain the do's and don'ts of various types of disaster.