5 . Disasters

5.1 Understanding Disasters

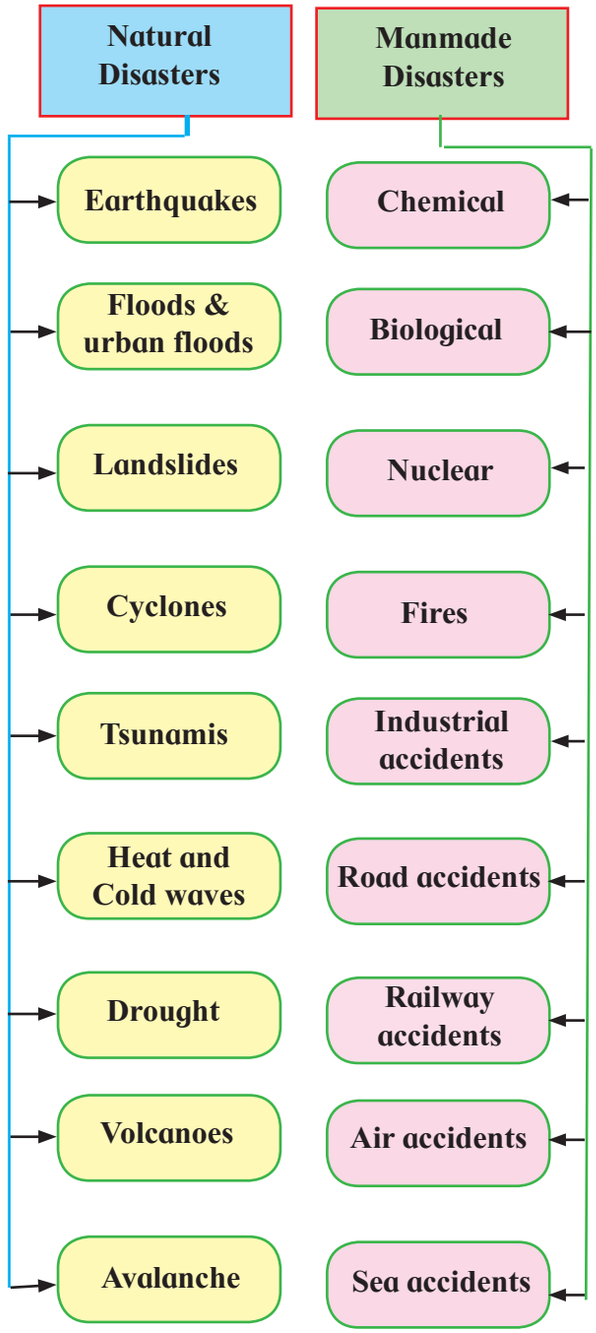
A disaster is "a sudden accident or a natural catastrophe that causes great damage or loss of life". A disaster is an event or series of events, which gives rise to casualties and damage or loss of property, infrastructure, essential envoronmental services, or means of livelihood.

Disasters threaten sustainable economic development worldwide. In the past twenty years, earthquakes, floods, tropical storms, droughts and other calamities have killed around three million people, inflicted injury, disease, homelessness, and misery on one billion pepole, and caused damage worth millions of rupees. Disasters destroy decades of human effort and investments, thereby placing new demands on society for reconstruction and rehabilitation.

Figure 5.1 : Examples of Natural disasters

Source : http://nidm.gov.in/PDF/dosaster_about.pdf

5.2 Types of disasters



Source : http://nidm.gov.in/en/#) & IGNOU New Delhi

Features of disasters-

- It disrupts the normal functioning of society.
- It affects large number of people.
- It causes large scale loss to life and property.
- It affects a community which requires external aid to cope with the losses.

Let us discuss some of the disasters as follows;

I. Natural Disasters	II. Man made Disasters
A) Earthquakes B) Floods & Urban floods C) Cyclones D) Tsunamis E) Drought	1) Biological 2) Nuclear 3) Fire 4) Industrial accidents

5.3 I. Natural Disasters

A) Earthquakes

Earthquakes cause the shaking, rolling or movement of the earth's surface. Earthquakes happen along cracks (called fault lines) in the earth's surface. Earthquakes can be felt over large areas, although they usually last less than one minute. Earthquake is a sudden geological event below the surface of the earth which results in generation of shock waves that travel far and wide and cause vertical and horizontal vibrations. These consequential motions cause destructions of infrastructure. The severity of the impact depends on the magnitude of the earthquake, which in turn depends on the amount of energy released at the spot where the geological event takes place below the surface of the earth. Scientific study of earthquakes is called seismology. Therefore, earthquake activity is also referred to as seismic activity.

Earthquakes are considered to be one of the most dangerous and destructive natural hazards. The impact of this phenomenon is sudden with very little warning or without any warning. Large number of earthquakes occur every year all-round the earth but only a limited number of them are centered near populated areas or are having sufficient strength to cause damage to

the environment. It can destroy buildings and infrastructure in seconds, killing or injuring the inhabitants. Earthquakes not only destroy the entire habitation but may destabilize economy and social structure of the region.

Earthquakes - seismicity in Maharashtra

The state of Maharashtra occupies the central-western portion of peninsular India, technically an intraplate continental area. A disastrous earthquake occured, at Koyna on December 11, 1967, with magnitude of 6.5 on the Richter Scale. Latur earthquake of September 30, 1993, with magnitude 6.4 these were caused by serious damage by adjustments of crustal blocks along such pre-existing weak zones.

Maharashtra and adjoining regions are prone to earthquakes of moderate magnitude as can be seen from the experience of several years. Koyna regions of Satara district have experienced the maximum number of tremors in Maharashtra.

Earthquakes in Maharashtra show major alignment along the west coast and Western Ghats region. Seismic activity can be seen near Ratnagiri, along the western coast, Koyna Nagar and Thane district.

Figure 5.2 :The Bhuj earthquake 26th January,2001
Source : http://.rsf.org.in?img/csr/05/jpg

Earthquakes; Do's & Don'ts-

a) If Indoor:

- DROP to the ground; take COVER by getting under a sturdy table or other piece of furniture; and HOLD ON until the shaking stops. If there isn't a table or desk near you, cover your face and head with your arms and crouch in an inside corner of the building.
- Stay away from glass, windows, outside doors and walls, and anything that could fall, such as lighting fixtures or furniture.
- Stay in bed if you are there when the earthquake strikes. Hold on and protect your head with a pillow, unless you are under a heavy loose fixture that could fall. In that case, move to the nearest safe place.
- Use a doorway for shelter only if it is in close proximity to you and if you know it is a strongly supported, loadbearing doorway.
- Stay inside until the shaking stops and it is safe to go outside.
- Be aware that the electricity may go out or the sprinkler systems or fire alarms may turn on.
- DO NOT use the elevators.

b) If Outdoors:

- Stay there.
- Move away from buildings, trees, streetlights, and utility wires.
- Once in the open, stay there until the shaking stops. The greatest danger exists directly outside buildings, at exits, and alongside exterior walls. Most earthquake-related casualties result from collapsing walls, flying glass and falling objects.
- Do not forget to carry the disaster emergency kit!

c) If in a moving vehicle:

- Stop as quickly as safety permits and stay in the vehicle. Avoid stopping near or under buildings, trees, overpasses, and utility wires.
- Proceed cautiously once the earthquake has stopped. Avoid roads, bridges, or ramps that might have been damaged by the earthquake.

Figure 5.3 : 'DROP', 'COVER', 'HOLD ON'activity during earthquake
(Source : http://nidm.gov.in/en/#)

Do you know?

Latur earthquake was one of the deadliest earthquakes Maharashtra has seen till date. The earthquake (Richter scale 6.4) struck at about 3.56 am on September 30, 1993. About 52 villages were destroyed, over 30,000 were injured and approximately 10,000 pepole were killed. The earthquake left a huge hollow at Killari, which was also the epicenter.

- The area of Latur was densely populated so, the toll of those who were killed and injured was very high.
- Since the earthquake's focus was 12-kilometre-deep, the shock waves caused more damage
- The National Disaster Management Authority (NDMA) monitoring center was set up after the Latur earthquake.

Figure 5.4 : What to do during an earthquake **(Source : http://nidm.gov.in/en/#)**

B) Floods -

Floods have been a recurrent phenomena in India from time immemorial. Almost every year floods of varying magnitude affect some parts of the country. Different regions of the country have varied climate and rainfall patterns. Therefore, while some parts face devastating floods, other parts may, experience drought conditions.

The monsoon regime is a regular phenomenon. Year-to-year variations occur with regard to the onset of the monsoon. The Indian subcontinent receives maximum rainfall during the south- west (SW) monsoon for a period of about 100 days, starting from the first week of June to the end September.

Flood denotes inundation or accumulation of water i.e. it results from an imbalance between inflow and outflow of water in a river. Floods can occur through heavy rains, dam failures, rapid snow melts, river or even bursting of water pipelines. Floods result in damage, deaths and injuries, and create problems in drinking water supply and food shortages. In India, 40 million hectares of land is vulnerable to floods and about 8-million-hectare is affected by floods annually. Thus, India is highly prone to floods especially in the monsoon and cyclone seasons. A major flood disaster in mumbai on 26 th July 2005 paralysed the whole city.

There are three types of floods i.e. flash floods, river floods, and coastal floods.

1. **Flash floods-** are generally events in hilly areas where sudden very heavy rain over a limited area can cause strong flow of water. Flash floods also occur when a temporary blockage in hilly areas impounds water, which when released suddenly creates havoc.
2. **River floods** - occur due to heavy inflow of water from heavy rainfall, snowmelt, and short intense storms. Flooding in rivers is also caused by inadequate capacity within the banks of the river to contain high flows, River bank erosion and silting of riverbeds, synchronization of flood in the main and tributary rivers, and flow retardation due to tidal and backwater effects the intensity of the flood.
3. **Coastal floods-** are caused due to tsunami or heavy rainfall from cyclones and the storm surge associated with a cyclone. The situation could be aggravated due to high tide. Tidal flooding is saline from the backflow of sea-water into coastal rivers at high tides. Flood due to storm surge is also saline and therefore, more destructive.

Floods affect Maharashtra quite frequently. Floods are not just restricted to one particular region, but are spread all over the state. Maharashtra, therefore, exhibits a high proneness to floods. Most floods occur during monsoon and hence, the accompanying damage such as deaths due to lightning, landslides, house crashes and drowning have been commonly reported from most districts. Floods destroys houses, crops and food stocks. They strip farm lands, wash away irrigation systems and erode large areas of land or make them unusable. Floods are more threatening for an agricultural economy such as that of Maharashtra, especially because of the heavy damage they cause, thereby disrupting the economy. Analyzing the floods in Maharashtra, one observes that most floods in Maharashtra are flash floods due to nallah-overflows and poor drainage systems.

Urban floods -

Urban areas are densely populated and people living in vulnerable areas suffer due to flooding, sometimes resulting in loss of life. It is not only the event of flooding but the secondary

effect of exposure to infection also has its toll in terms of human suffering, loss of livelihood and, loss of life.

Major cities in India have witnessed loss of life and property, disruption in transport and power and incidence of epidemics. Therefore, management of urban flooding has to be accorded top priority. Increasing trend of urban flooding is a universal phenomenon and poses a great challenge to urban planners the world over. Problems associated with urban floods range from relatively localized incidents to major incidents, resulting in cities being inundated from hours to several days.

Figure 5.5 : July 26, 2005, Mumbai flood
(Source : http://www.downoearth.org.in)

*** Do's and Don'ts during floods -**

- DO keep your emergency kit with you, safe and dry
- DO watch out for your children at all times AND DO NOT allow them to swim or play in flood water
- DO take care of elderly people
- DO take particular care of people with special needs.
- DO take note of the health of your family and community members.
- DO evacuate to higher ground where possible
- DO listen to local announcements over loud-speaker/ public broadcast, radio or TV where possible – and carefully follow all advice and warnings
- Do not forget to carry the disaster emergency kit!

*** Floods; Don'ts -**

- DO NOT wade through flood water
- DO NOT eat food which has been in contact with flood water
- DO NOT drink water from wells; ONLY drink water which has been boiled, or supplied in bottles
- DO NOT use gas, electricity or electrical appliances which have come into contact with flood water – until they have been checked by safety officials.
- DO NOT walk near river banks, sand bag mounds or canal edge as these may collapse.

During Floods - Do's

Turn of power and gas connection be alert for gas leaks.

Evacuate low line areas and move to safer places.

Bring boiled/clorinated water.

Stay away from sewage lines, gutters, drains etc.

Stay away from electric ports and fallen power lines to avoid electrocutions.

Watch out for broken electric poles and wires, sharp objects and debris.

If you must prepare to evacuate, you should:

- Secure your home. If you have time, bring in outdoor furniture. Move essential items to an upper floor.
- Disconnect electrical appliances. Do not touch electrical equipment if you are wet or standing in water.
- Do not forget to carry the disaster emergency kit!

C) Cyclones

Cyclones are violent rotating windstorms. They are Tropical storms which occur in nearly every major ocean across the world. Cyclones occur in the Indian Ocean; the Bay of Bengal. The cyclones move around an area of low atmospheric pressure. Tropical cyclones are characterized by destructive winds and copious rainfall, which causes flooding. In such storms, winds can exceed speeds of over 120 kmph. Due to such strong winds, sea-water accumulates ahead of the cyclone as it moves towards the coast. When a cyclone hits the coast, the accumulated enormous mass of sea- water strikes the coast as a giant sea wave called storm surge. Cyclones pose a major threat to life and property. Cyclones have different nomenclatures, like hurricanes in America and typhoons in Japan.

History of Cyclones in Maharashtra

In the Arabian sea, during the period 1890-1995, these were 207 depressions/cyclonic storms/severe cyclonic storms that have been recorded. Most of them have moved away from Maharashtra. Thus, the coastal region of Maharashtra is climatologically an area where frequency of cyclonic disturbances is very low. Out of 207 disturbances, only 19 have affected Maharashtra - Goa coast. Of these six were major ones causing 70 deaths, with 150 boats and 160 crew missing and extensive damage to trees and ships. The wind and cyclone hazard map for Maharashtra has also been produced indicating the risk zones according to possible impact.

Mumbai which is the economic capital of India, is also a coastal city which has faced many threats of cyclones in recent times. It has faced peripheral impact in 1982, 1988 and 1996, and has been hit on two occasions (June, 1948 and 1996). It indicates that the city is prone to cyclones. Considering these problems, the Indian economy may have to face a serious problems if Mumbai is hit by a cyclone. It becomes far more important to implement preventive and preparedness measures.

Before the Cyclone season-

- Check the house; secure loose tiles, carry out repair works for doors and windows
- Remove dead woods or dying trees close to the house
- Keep some wooden boards ready so that glass windows can be boarded if needed
- Keep a hurricane lantern filled with kerosene, battery operated torches and enough dry cells
- Demolish condemned buildings
- Keep some dry non-perishable food always ready for emergency use
- Keep the disaster emergency kit with you ready!

D) Tsunamis

A tsunami is a series of waves with a long wavelength and period. Tsunamis are often incorrectly called tidal waves; they have no relation to the daily ocean tides. Tsunami (soo-NAH-mee) is a Japanese word meaning 'harbour wave', the sea waves generated by undersea earthquakes. These waves may originate from undersea or coastal seismic activity, or volcanic eruption. Whatever may be the cause, seawater is displaced into a violent and sudden motion ultimately breaking over land even at very long distances with great destructive power.

Tsunami events or those less than 30 minutes from the source cause the majority of damage. The force of the water can destroy everything in its path. It is normally the flooding effects of the tsunami that causes major destruction to the human settlements, roads and infrastructure and damage to ports/airports thereby disrupting the normal functioning of the society. Withdrawal of the tsunami causes major damage. As the waves withdraw towards the

ocean, they sweep out the foundations of the buildings, the beaches get destroyed and the houses carried out to sea. Apart from the physical damage, there is a huge impact on the public health system. Deaths mainly occur because of drowning as water floods homes. Many people get washed away or crushed by the giant waves and some are crushed by the debris.

It can be highly destructive to coastal areas as was witnessed during the catastrophic tsunami event in December 2004. On the 26th December 2004, tsunami considerably affected the coastal regions of southern peninsular India. Nearly 8,835 human lives were lost with 86 persons reported missing. Extensive damage was recorded in terms of housing stock along the coast, as well as bridges and roads. Structures were damaged by direct pressure from tsunami waves, and scouring damage was induced by the receding waves.

Tsunamis; Do's and Don'ts

- You should first protect yourself.
- Gather members of your household and move quickly to higher ground away from the coast.
- Avoid downed power lines and stay away from damaged buildings and bridges from which heavy objects might fall.
- Do not forget to carry the disaster emergency kit!

Figure 5.6 : Japan Tsunami Fukushima Daichi Nuclear disaster , 14 th March,2011
(Source : http://sites.suffolk.edu)

Figure 5.7 : A general view of the scene of Marina beach in Chennai, India, On December 26, 2004, after tsunami wave hit the region. Waves devastated the southern Indian coasttime killing an estimated 18,000 People. (Source : http://www.theatlantic.com)

Do you know?

• The tsunami that occurred during 2004 Sumatra-Andaman earthquake of Mw 9.3 was primarily caused by vertical displacement of the seafloor, in response to slip on the inter-plate thrust fault. The earthquake and resulting tsunami in the Indian Ocean affected many countries in Southeast Asia and beyond, including Indonesia, Sri Lanka, India, Thailand, the Maldives, Somalia, Myanmar, Malaysia, Seychelles and others.

• Many other countries, especially Australia and those in Europe incurred casualties due to the tsunami, because they had large numbers of citizens traveling in the region on holiday. This tsunami-genic earthquake was one of the ten worst earthquakes in recorded history, as well as the single worst tsunami in history. Indonesia was the worst affected country. Beyond the heavy toll on human lives, the Indian Ocean earthquake has caused an enormous environmental impact that will affect the region for many years to come. The disaster also caused a substantial geo-physical impact in Indian Ocean. The disaster invited attention of affected countries for setting up effective tsunami early warning system and institutional mechanism for handling disasters.

• The Government of India has put in place an Early Warning System for mitigation of such oceanogenic disasters under the control of Indian National Center for Ocean Information Services (INCOIS), Hyderabad.

E) Drought-

Variations of rainfall in monsoon leading to water shortage causes drought. In India, almost three-fourths of annual rainfall is received during South West Monsoon Period (June-September) and erratic nature of monsoon (South West Monsoon), with long dry spells and high temperature. This is mainly responsible for drought. Drought is declared by the respective State Governments considering rainfall situation, crop growth etc. The Deccan plateau constitutes 50 percent of the drought-prone areas of the state. 12 percent of the population lives in drought-prone areas. Once in 5 years, deficient rainfall is reported. Severe drought conditions occur once every 8-9 years. The 1996 drought affected 7 districts and 266.75 lakh people. The 1997 drought affected 17 districts.

Types of droughts:

1. **Meteorological Drought –** referring to lack of precipitation.
2. **Agricultural drought –** referring to lack of moisture in the soil where crops grow.
3. **Hydrological drought –** referring to low levels of water in reservoirs.
4. **Socio-economic drought –** referring to water shortages affecting people in society, which impacts availability of food grains, fodder, etc.

Drought;

Do's and Don'ts-

1. Monitoring of rainfall situation during South West Monsoon period, on regular basis.
2. Issue of advisories to farmers for taking up drought resistant crops & crops requiring less water.
3. Judicious use of available water.
4. Ensure availability of agricultural inputs.
5. Optimum utilization of funds available under various schemes/programmes implemented by Central and State Govts. towards mitigating adverse effects of drought.

6. Do not waste water, especially drinking water, as it is precious.
7. Do not waste food, as it could be useful for those in need.

Do you know?

Jalyukta Shivar Abhiyaan: Under the theme of 'a drought-free state by 2019', is being implemented across the State of Maharashtra since December, 2014 with a view to permanently overcome the water scarcity situation. The main aim of this abhiyaan is to increase ground water level by way of percolation of rain water in the ground along with creation of sustainable irrigation facilities.

It is targeted to make 5,000 villages every year and 25,000 villages in five years free of water scarcity. During 2017-18 as on 12th January, number of villages selected are 5,018 in which 7,683 works are completed and 6,440 works are in progress.

5.4 II Manmade Disasters

Difference of Man made Disasters from Natural Disasters:

In most cases of natural disasters, the hazard is directly attributable, however the main causes of man-made disasters are complex and inter-related. Man-made disasters could also result from natural disasters as, for example- earthquake may render large number of people homeless and without livelihood, which could lead to unforeseen consequences. To a certain extent, natural disasters may sometimes be considered as human induced disasters. Areas with severe deforestation, erosion, over cultivation and over grazing tend to be hardest hit by disasters.

Causes of Man-made Disasters

Human induced disasters occur due to many and varied causes. They could arise from the indiscriminate industrialization, over population, increased consumerism, use of hazardous substances or processes or simply accidents of various types. Negligence on the part of professionals as well as the public along with ignorance increases the possibility of man-made disasters.

Man made disaster could also be caused due to unintentional activity, poor maintenance, low quality work or human error. On the other hand, they could also result from willful, deliberate and intentional activity, such as sabotage, mischief, revenge, riots, mob fury or enemy attack. Sometimes, man-made disasters, especially those related to industrial and technological causes, are the results of system or process malfunctioning as in the case of nuclear radiation, gas leak, explosion and fire etc.

1) Biological Disasters

Biological disasters are natural scenarios involving disease, disability or death on a large scale among humans, animals and plants due to micro-organisms like bacteria, or virus or toxins.

Biological disasters may be in the form of: -

- Epidemic affecting a disproportionately large number of individuals within a population, community, or region at the same time, examples being Cholera, Plague.
- Pandemic is an epidemic that spreads across a large region, that is, a continent, or even worldwide of existing, emerging or reemerging diseases, example- Influenza H_1N_1 (Swine Flu).

Examples :

A) Mosquito Borne Diseases Like Malaria, Dengue, Filaria, Chikungunya, Swine Flu (H_1N_1)

Do's

1. Follow "sun-down sleeves-down" approach. Wear clothes that cover arms and legs.
2. Prevent water collections on ground and other places to prevent malaria breeding.
3. Empty water containers at least once a week.
4. Remove water from coolers from time to time.
5. Cover and seal any septic tanks.
6. Use Mosquito Nets Preferably Insecticide Treated Bed Nets (ITBN)
7. Apply insect repellants while sleeping to keep away mosquitoes.

Don'ts

1. Do not encourage children to wear shorts and half sleeved clothing.
2. Do not allow water to stagnate.
3. Do not allow discarded items to accumulate such as tires, tubes, empty coconut shells, household items and objects where water may collect.
4. Do not bathe in village ponds and allow cattle to take bath in the same pond.

B) Diarrhoeal Group Of Diseases Including Cholera:

Do's -

1. Hand Hygiene
2. Encourage drinking of water from a safe source or water that has been disinfected (chlorinated). Add bleaching powder in all community wells at regular intervals.
3. Drink boiled potable water in an emergency that has been boiled for at least 15 minutes and consumed it on the same day.
4. Promote storage of water in narrow mouthed container.
5. Cook food thoroughly especially meat, poultry, eggs and seafood until it is steaming and eat it while it is still hot.
6. Ensure cooked meat and poultry is safe and no part of the meat discoloured or foul smelling & keep food items covered.
7. Increase fluid intake as soon as diarrhoea starts by drinking ORS solution or lemon juice.
8. Encourage banana eating, which provides potassium.
9. Continue feeding children when they are sick and to continue breastfeeding if the child is being breast fed.
10. Refer the diarrhoea case to a health facility in case of the following: Child is irritable, restless or lethargic or unconscious: eating or drinking poorly; child has marked thirst; child has fever or blood in stool.

Don'ts -

1. Do not drink water from unsafe sources.
2. Do not eat uncooked food unless it is peeled or shelled.
3. Do not leave cooked food at room temperature longer than 2 hours.

4. Do not consume cut fruits from vendors.
5. Do not defecate in open area.
6. Do not give access to rats and houseflies in your premises.

C) Respiratory Group Of Diseases Like Tuberculosis, Influenza, Chickenpox, Meningitis;

Do's & Don'ts :

1. Avoid close contact with people who are having respiratory illness.
2. The sick person should stay at home, and avoid going into the community, school/ office, public places for at least 24 hours after symptoms have resolved.
3. Sick persons at home should keep distance from others.
4. Respiratory Hygiene/Cough Etiquette: -

a) Cover the nose/mouth with a handkerchief/ tissue paper when coughing or sneezing which should be disposed-off in dustbins;

b) Perform hand hygiene (e.g., frequent hand washing with soap and water, alcohol-based hand rub, or antiseptic hand wash) and thoroughly dried.

5. Triple layer surgical Mask of standard and certified make should be worn by Suspected/ probable/confirmed cases of influenza.
6. Get plenty of sleep, be physically active, manage your stress, drink plenty of fluids, and eat nutritious food.
7. Avoid smoking.
8. Persons who have difficulty in breathing or shortness of breath should seek immediate medical attention and report to the nearby hospital.
9. Immunization status should be up to date as per National Universal Immunization Programme.

2) Nuclear disasters -

The growth in the application of nuclear science and technology in the fields of power generation, medicine, industry, agriculture, research and defence has led to an increase in the risk of occurrence of Nuclear emergencies.

Nuclear emergency can arise in a nuclear facility at plant level leading to plant/ site or offsite emergency depending upon the extent of its impact on the surroundings. It can also take place while using radiation sources, either at hospitals, industries and agriculture or research institutions due to misplacement or because of faulty handling. The other events that can lead to nuclear emergencies in the public domain include, accident of a vehicle carrying radioactive material. The memories of the use of nuclear weapons dropped on Hiroshima and Nagasaki and the wide publicity given to the reactor accidents at Chernobyl in erstwhile USSR, have strongly influenced the public perception of any nuclear or radiological emergency. It may be noted that better infrastructure can be helpful during such incidences in terms of enhanced communication, transport and medical support. Nuclear emergencies can still arise due to factors beyond the control of the operating agencies however, proper emergency preparedness plans must be in place so that there is minimum avoidable loss of life, livelihood, property and impact on the environment.

Do You Know?

In 1986, on April 26, the world worst nuclear power plant accident occurs at the Chemobyl nuclear power station on the Soviet Union. Thirty-two people died and dozens more sufficient radiation burns in the opening days of the crisis.

A a Part of their poorly designed experiment, the engineers disconnected the reactor's emergency safety systems and it's power regulationg system. Next, they compounded this irresponsibility with a series of mistakes. They ran the reactor at a power level so low that the reactions became unstable, and then removed too many of the reactor's control rods in an attempt to power it up again. The reactor's output rose to more than 200 megawatts proving increasingly difficult to control. At 1:23 a.m. on April 26, the engineers continued with their experiment and shut down the turbine engine to see if it's inertial spinning would power the reactor's water pumps. In fact, it did not adequately power the water pumps, and without cooling water the power level in the reactor surged.

In the beginning days of the crisis, 32 people died at Chenobyl and several more suffered radiation on burns. The radiation that escaped into the atmosphere, which was several times that was produced by the atomic bombs dropped on Hiroshima and Nagasaki, was spread by the wind over Northern and Eastern Europe, containing millions of acres of forest and farmland. An estimated 5,000 Soviet citizens eventually died from cancer and other radiation induced illness caused by their exposure to the Chenobyl radiation and millions more had their health adversely affected. In 2000, the last working reactors at Chenobyl were shut down and the plant was officialy closed.

3) Fire

Fires can spread rapidally and have a very serious effect on our lives, homes, and families. It is very important that everyone in your family is aware of proper fire protection.

Figure 5.8 : Fire Incident
(Source : http://google.com)

Fire-

Do's

1. Stay Calm, don't panic and don't run.
2. Raise alarm and alert everyone in your premises.
3. Escape first and then call for help.
4. Use nearest available exit routes.
5. While leaving the premises, close all doors & windows behind you if possible but must ensure that nobody is left behind and you are safe.
6. Use only escapes routes because they are built for the purpose.
7. Use staircase "Don't use Lifts".
8. If you are trapped in your room, close the door and block any gaps which might let smoke or fumes through. Shout from the window to attract attention of rescue team as well as others.
9. Do not forget to carry the disaster emergency kit before you evacuate!

Fire-

Don'ts

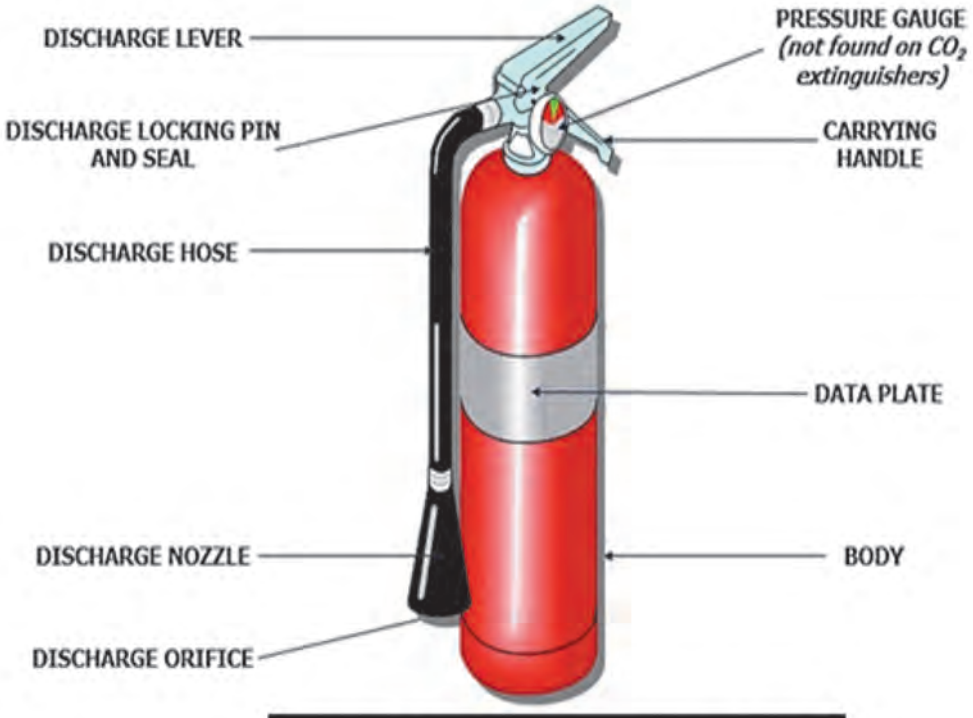
1. Never stand up in a fire always crawl low under the smoke and try to keep your mouth covered.

2. Never go back into a burning building for any reason.
3. Teach children not to hide from fireman, if someone is missing, tell the fireman. They are equipped to perform rescues safely.
4. Don't secure open fire and smoke check doors as they limit the spread of fire and smoke when in closed position.
5. Don't be tempted to clutter the stairs, corridors and lobbies as they are your escape routes.
6. Never use lifts in case of fire. Always use staircase.
7. Do not stop to collect belongings.
8. Don't shout or run. This tends to cause panic to others
9. Discourage use of fire crackers.

How to use fire extinguisher-

The PASS Method for Using a Fire Extinguisher-

1. PASS Step 1: PULL the pin. Many fire extinguishers have a pin near the handle at the top.
2. PASS Step 2: AIM the nozzle, horse, or hose. ...
3. PASS Step 3: SQUEEZE the handle. ...
4. PASS Step 4: SWEEP from side to side at the base of the fire.



Fig; Know the fire extinguisher

Figure 5.9: Know the fire extinguisher

(Source : http://dgfscdhg.gov.in/mass-awarenwss-in-english)

Do you Know?

Among cities, Mumbai leads in fire mishap deaths; 3,781 people died during 2006-2015. India reported 2.16 lakh deaths in fire accidents between 2006 and 2015, with nearly 64 per cent of the victims being women. The National Crime Records Bureau Data indicates that a total of 113961 people lost their lives due to Fire Accidents from 2010 to 2014. This is an average of 62 deaths a day. Maharashtra alone accounted for 24293 deaths or 21.3% of all the deaths due to fire accidents.

Maharashtra's capital Mumbai has recently witnessed five deadly fire accidents with the latest one occurred in South Mumbai's Fort area, the other four incidents have resulted in deaths of more than 30 people. The incidents have taken place at Kamala Mills compound (Dec 29, 2017), Mamoon Manzil building at Marol (January 4, 2018), Sessions Court in Fort (January 8, 2018), Cinevista studio in East Mumbai (January 6, 2018), and a snack shop in Saki Naka area (December 18, 2017).

4) Industrial disasters -

In highly industrialized cities, accidents can caused serious impacts on citizen. Industrial development has led to concentration and localization of industries in certain areas where attempts at regulating them are essential. These require strong legal framework with adequate institutional prevention and implementation management. Industrial disasters are caused due to malfunctions, failures or unanticipated side effects of technological processes. This usually occurs in the form of explosions, fires, spills, leaks or wastes. All technological innovations have benefits but also carry risks. A technological disaster is a manmade disaster because of failure of proper management.

Do you know?

An example of hazardous material disaster is Bhopal Gas Tragedy that occurred in December 1984. Approximately 2500 people died in this tragedy and thousands of people were directly or indirectly affected by this accident. This is witnessed as the world's worst chemical (industrial) disaster "Bhopal Gas Tragedy" in the year 1984. It was most devastating chemical accident in history, where over thousands of people died due to accidental release of toxic gas Methyl Isocyanate (MIC). Such accidents are significant in terms of injuries, pain, suffering, loss of lives, damage to property and environment. India continued to witness a series of chemical accidents even after Bhopal had demonstrated the vulnerability of the country.

Another threat really being faced by disaster management is the threat from atomic and nuclear sources, and this threat is really in the form of radiation. Problems like nuclear leaks are likely because of development programmes in this field. The possibility of global war may have receded over recent years but the possibility of nuclear weapons being used in some lesser form of conflict cannot be disregarded altogether. Even though a country is not directly involved in use of such nuclear activities or terrorism, it could well suffer severely from the radioactive side effects.

5.5 Effects of disasters-

It is common knowledge that natural disasters have catastrophic effects on the place and people. The adverse impacts are much more in the developing countries with a large population and high vulnerability in terms of weak infrastructure and poor support systems. Disasters not only do enormous damage, cause deaths, destroy food sources, spread disease and

epidemics. They create unemployment and they unsettle the entire rhythm of life of the affected community for a long time. It requires enormous physical, financial and motivational resources to bring the impoverished and demoralized community back to normal. As most of the natural disasters occur suddenly or with short notice, direct effects include damage to houses, equipments, crops, infrastructure (bridges and roads) and loss of life. Malnutrition, envioronment related disease and migration are the indirect effects. Economic impact can be seen in the form of emergency relief costs.

Do you know?

As a part of overall preparedness of the State, the GoM (Government of Maharashtra) has a State Disaster Management Plan to support and strengthen the efforts of district administration. The Centre for Disaster Management (CDM) of the GoM was set up in August 1996 with support from the Natural Disaster Management Division, Department of Agriculture and Cooperation, Ministry of Agriculture, Govt. of India. Its infrastructure consists of Documentation Centre and a stand-by Control Room (with 30 seconds connectivity for Video Conferencing, VSAT, Email and Fax Communication (www.yashada.org). Under 1996 Disaster Management Council's mandate, the Government of Maharashtra prepared a plan, which involves:

- Scrutinizing disasters like earthquakes, floods, cyclones, epidemics, road accidents, industrial and chemical accidents, and fires,
- Estimating their footprint and reach,
- Listing down the monitoring facilities and regulatory regimes,
- Tracing the counter measures available to handle the disasters.

Disasters disrupt social life and economic activities. The damage and rehabilitation work after the disasters generally halts developmental activities. Because of the circumstances in the aftermath of disasters, the human and financial resources earmarked for development have to be shifted to relief and rehabilitation at least partly if not fully.

The District Disaster Management Plan

To support and strengthen the efforts of district administration, every district has its own District Disaster Management Plan (DDMP) that addresses the districts' response to the disasters.

The objectives of DDMP are

1. To improve preparedness at the district level, through risk and vulnerability analysis of disasters and to minimize their impact in terms of human, physical and material loss.
2. To ascertain the status of existing resources and facilities available with the various agencies involved in the district and make it an exercise in capacity building of district administration.
3. To utilize different aspects of the disaster for development planning as a tool for location and area specific planning for development of district.

As a part of this plan the control rooms are established at the Collectorate and at each Tehsil office in the district, which should be kept functioning 24 hours a day. The phone numbers are informed to all departments. The Superintendent of Police office and public hospitals are directed to develop preparations in case of emergency situations and contact is maintained with the police control room. The District Control room has facilities of wireless communication, hot line, fax, e-mail and video conferencing.

5.6 The Disaster Emergency Kit

Have a disaster emergency kit ready as follows;

1. **Battery operated torch, radio, extra batteries, candles, lighter,**
2. **First aid kit and manual.**
3. **Important documents, passport, insurance details, house deeds, bank details, medical prescriptions, certificates**
4. **Emergency food (dry items) and water (packed and sealed).**
5. **Candles and matches in a waterproof container, knife, can opener, chlorine tablets or powdered water purifiers.**
6. **Essential medicines, cash and credit cards.**
7. **Thick ropes and cords, sturdy shoes.**

Figure 5.10: The Disaster Emergency Kit (Source : http://ndma.gov.in/en/#)

5.7 Activity

1. List the natural disaster phenomena likely in the Indian subcontinent. Describe the regional and seasonal profile of any two disasters.
2. Prepare a list of natural disasters, which are affecting your area and explain their impacts and identify your role to reduce it.
3. Draw a chart of do's and don'ts of the common disaster experienced in your region and display the same in your classroom/school board and also during festivals/public meetings.
4. Design the disaster emergency kit on a chart and display it in your classroom/school notice board.
5. Make an evacuation plan for your school during emergency. Display it in your classroom/ school board, and in each stairway. Explain during the assembly and National Day assembly too.

Exercise

Q.1. Select the most appropriate alternative from the given questions below.

1) The sequence of operating a fire-extinguisher is;

a) SWEEP » AIM » PULL » SQUEEZE

b) AIM » SWEEP » SQUEEZE » PULL

c) PULL » AIM » SQUEEZE » SWEEP

d) SQUEEZE » PULL » AIM » SWEEP

2) Man made disaster could also be cause due to …….

a) uninntentional activity

b) carelessness

c) low quality work

d) All of the above

3) 'Tsunami'is a disaster that occurs due to …….

a) Volcanic eruption

b) High tides

c) Undersea seismic activities

d) Heavy rainfall

4) 'Drop to Ground', 'Take cover', 'Hold on' are the actions related to ……. disaster.

a) flood

b) fire

c) drought

d) earthquake

5) ……. are the features of disaster.

i) It affects a large number of people

ii) Causes large scale loss of life and property

iii) Disrupts normal functioning of society

iv) Needs external aid to cope with the loss

Q.2. Answer the questions given below.

1. Enlist some Do's during earthquakes
2. Enlist some Do's during floods
3. Enlist some Do's during fires
4. Enlist some Do's during mosquito borne diseases
5. Enlist some Do's during respiratory group of diseases.

Q.3. Answer the following questions in brief.

1) What is an earthquake? Why is it called as seismic activity?

2) What do you mean by manmade disaster? Enlist some causes of manmade disasters.

3) Explain the 'PASS' method for using a fire extinguisher.

4) Write a short note on effects of disasters.

5) What precautions should we take in case of a diarrhoeal disaster?

6) Enlist some precautionary measures before the cyclones.

7) Write a note on the contents of a 'Disaster emergency kit'