

DISASTER STUDIES - 18BGE35S

UNIT – IV

Human induced:

Thermal:

In the light of the above considerations, and in order to have at our disposal precise points of reference as regards the management of rescue operations, we think it may be useful to define precisely the two concepts of "thermal agent disaster" and "burn disaster". Although these two concepts are linked by the common denominator of fire, they refer to events which, in view of a different evaluation of the damage caused, require operational rescue phases with varying commitments.

This must develop along three lines: immediate care, medical rescue within three hours, use of specific equipment and means for the rescue of the burned patient.

Such an approach will make it possible to achieve maximum efficiency also in relation to the numerous factors that normally condition the evolution of a disaster:

The unpredictability of when the disaster occurs, The moment of the disaster (day, night, festivity, etc.). The characteristics of the disaster (with explosion, collapse of buildings, production of toxic gases and fumes, if a forest fire, etc.). The area where the disaster occurs (city, non urban area, accessibility, presence of material suitable for relief operations, etc.). The type of building involved (dwelling, hotel, office, hospital, etc.). The number of persons injured and the type of trauma the population's degree of preparedness to manage the disaster situation.

Nuclear and Chemical disaster :

Nuclear disaster, which include nuclear power plants, industrial radiation devices, and nuclear weapons, result from energy and particles released from the nuclei of atoms. The energy released during a nuclear explosion, which comes from energy released from electron shells around the nuclei, can be more than 1 million times greater than that of a conventional explosion. Radiation includes alpha radiation (two protons and two neutrons released from the nucleus), beta radiation (small positively- or negatively-charged particles released from the nucleus), gamma and x-rays (energy), and neutrons.

Chemicals can pose several types of hazards. Corrosive chemicals such as acids and bases burn the eyes, skin, and lungs. Flammable chemicals cause thermal burns and release toxic smoke. Toxic chemicals cause poisoning or infections. Reactive chemicals can start fires, release toxic or explosive vapors, or explode when coming in contact with other materials. Many chemicals present more than one type of hazard. Consider all these hazards when evaluating chemicals.

Health Hazard: All chemicals we use can potentially cause harm to our health so its very important that we understand what that hazards are and how to prevent exposure. There are four main classes of health hazard namely corrosive, toxic, harmful and irritant. These are then sub-divided into different categories depending on the degree of danger and assigned specific hazard statements

Corrosive: Corrosive material which may cause skin burns and permanent eye damage.
Avoid contact with skin and eyes, Do not breathe vapours or sprays, Wear protective clothing.

Toxic: Toxic material which may cause life threatening effects even in small amounts and with short exposure.

Harmful: May cause serious and prolonged health effects on short or long term exposure.

Irritation: May cause irritation (redness, rash) or less serious toxicity.
Keep away from skin and eyes, Avoid release to the environment.

Global Warming:

Definition:

“Global warming is a gradual increase in the earth’s temperature generally due to the greenhouse effect caused by increased levels of carbon dioxide, CFCs, and other pollutants. “

What is Global Warming?

Global warming is the phenomenon of a gradual increase in the temperature near the earth’s surface. This phenomenon has been observed over the past one or two centuries. This change has disturbed the climatic pattern of the earth. However, the concept of global warming is quite controversial but the scientists have provided relevant data in support of the fact that the temperature of the earth is rising constantly. There are several causes of global warming, which have a negative effect on humans, plants and animals.

Causes of Global Warming

Following are the major causes of global warming: *Man-made Causes of Global Warming and Natural Causes of Global Warming.*

Man-made Causes of Global Warming

Deforestation: Plants are the main source of oxygen. They take in carbon dioxide and release oxygen thereby maintaining environmental balance. Forests are being depleted for many domestic and commercial purposes. This has led to an environmental imbalance,

thereby giving rise to global warming. **Use of Vehicles:** The use of vehicles, even for a very short distance results in various gaseous emissions. Vehicles burn fossil fuels which emit a large amount of carbon dioxide and other toxins into the atmosphere resulting in a temperature increase. **Chlorofluorocarbon:** With the excessive use of air conditioners and refrigerators, humans have been adding CFCs into the environment which affects the atmospheric ozone layer. The ozone layer protects the earth surface from the harmful ultraviolet rays emitted by the sun. **Industrial Development:** With the advent of industrialization, the temperature of the earth has been increasing rapidly. **Agriculture:** Various farming activities produce carbon dioxide and methane gas. **Overpopulation:** Increase in population means more people breathing. This leads to an increase in the level of carbon dioxide, the primary gas causing global warming, in the atmosphere.

Natural Causes of Global Warming

Volcanoes: Volcanoes are one of the largest natural contributors to global warming. The ash and smoke emitted during volcanic eruptions goes out into the atmosphere and affects the climate. **Water Vapour:** Water vapour is a kind of greenhouse gas. Due to the increase in the earth's temperature more water gets evaporated from the water bodies and stays in the atmosphere adding to global warming. **Melting Permafrost:** Permafrost is there where glaciers are present. It is a frozen soil that has environmental gases trapped in it for several years. As the permafrost melts, it releases the gases back into the atmosphere increasing the earth's temperature. **Forest Blazes:** Forest blazes or forest fires emit a large amount of carbon-containing smoke. These gases are released into the atmosphere and increase the earth's temperature resulting in global warming.

Effects of Global Warming: The major effects of global warming:

- **Rise in Temperature:** Global warming has led to an incredible increase in earth's temperature. Since 1880, the earth's temperature has increased by ~1 degrees. This has resulted in an increase in the melting of glaciers, which have led to an increase in the sea level. This could have devastating effects on coastal regions.
- **Threats to the Ecosystem:** Global warming has affected the coral reefs that can lead to a loss of plant and animal lives. Increase in global temperatures has made the fragility of coral reefs even worse.
- **Climate Change:** Global warming has led to a change in climatic conditions. There are droughts at some places and floods at some. This climatic imbalance is the result of global warming.
- **Spread of Diseases:** Global warming leads to a change in the patterns of heat and humidity. This has led to the movement of mosquitoes that carry and spread diseases.
- **High Mortality Rates:** Due to an increase in floods, tsunamis and other natural calamities, the average death toll usually increases. Also, such events can bring about the spread of diseases that can hamper human life.

- **Loss of Natural Habitat:** A global shift in the climate leads to the loss of habitats of several plants and animals. In this case, the animals need to migrate from their natural habitat and many of them even become extinct. This is yet another major impact of global warming on biodiversity.

Ground water depletion:

- Groundwater is a valuable resource both in the United States and throughout the world.
- Where surface water, such as lakes and rivers, are scarce or inaccessible, groundwater supplies many of the hydrologic needs of people everywhere.
- In the United States, it is the source of drinking water for about half the total population and nearly all of the rural population, and it provides over 50 billion gallons per day for agricultural needs.
- Groundwater depletion, a term often defined as long-term water-level declines caused by sustained groundwater pumping, is a key issue associated with groundwater use.
- Many areas of the United States are experiencing groundwater depletion.

Deforestation:

Deforestation is the permanent removal of trees to make room for something besides forest. This can include clearing the land for agriculture or grazing, or using the timber for fuel, construction or manufacturing. Forests cover more than 30% of the Earth's land surface, according to the World Wildlife Fund. These forested areas can provide food, medicine and fuel for more than a billion people.

Reasons forests are destroyed: The World Bank estimates that about 3.9 million square miles (10 million square km) of forest have been lost since the beginning of the 20th century. In the past 25 years, forests shrank by 502,000 square miles (1.3 million square km) — an area bigger than the size of South Africa. The Guardian reported that every second, a chunk of forest equivalent to the size of a soccer field is lost.

Effects of deforestation: Forests can be found from the tropics to high-latitude areas. They are home to 80% of terrestrial biodiversity, containing a wide array of trees, plants, animals and microbes, according to the World Bank, an international financial institution.

Deforestation solutions: Developing alternatives to deforestation can help decrease the need for tree clearing. Forests can also be restored, through replanting trees in cleared areas or simply allowing the forest ecosystem to regenerate over time. The sooner a cleared area is reforested, the quicker the ecosystem can start to repair itself. Afterward, wildlife will return, water systems will reestablish, carbon will be sequestered and soils will be replenished.

References:

<http://www.medbc.com>

<https://relief.unboundmedicine.com>

https://www.hsa.ie/eng/your_industry/chemicals/legislation_enforcement/classification_and_labelling/consumer_information/health_hazards/

<https://byjus.com>