

Concept of Hazards and Disaster : Nocturnal, Quasi-Natural and man-made hazard management

Environmental Hazards :- Hazard is defined as a potential threat to humans and their

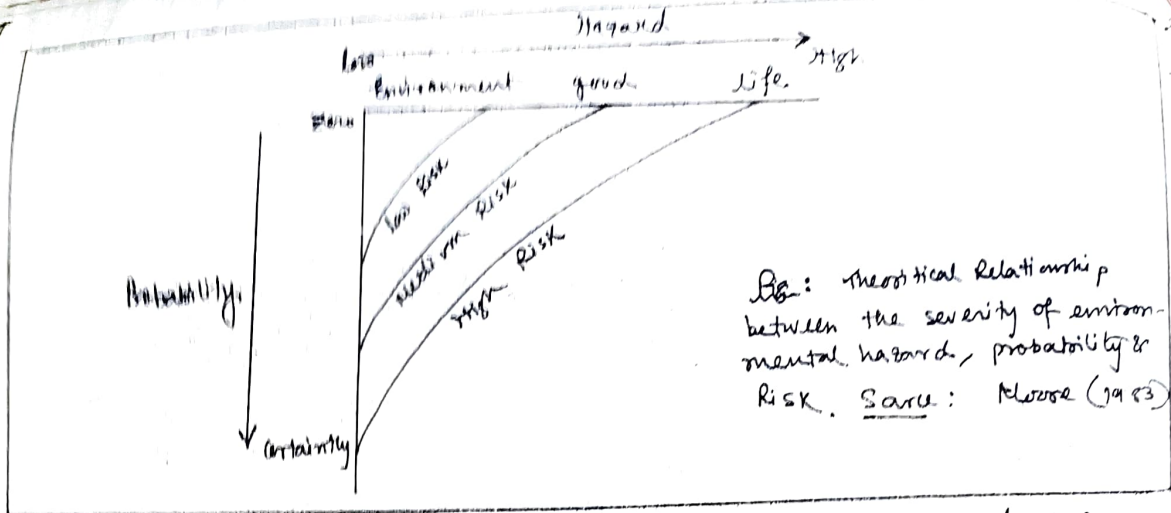
welfare. Environmental hazards may be defined as those extreme events of the earth, either natural or man-induced which exceeds the tolerable limits, make recovery difficult and result in huge losses of property, income & lives. It is a rare or extreme event in the natural or man made environment that adversely affect human life, prosperity or activity to the extent of causing a disaster.

✓ According to the Disaster Preparedness Training Manual, Philippine National Red Cross (1954), Hazard is a phenomenon that pose a threat to people, structures or economic assets and which may cause a disaster. They could be either manmade or naturally occurring in our environment.

The United Nations Commission for Human Settlement (UNCHS) defines natural hazards as a process of quantification in terms of the physical damage caused by natural phenomena as well as probability of its occurrence in a given period in a given area.

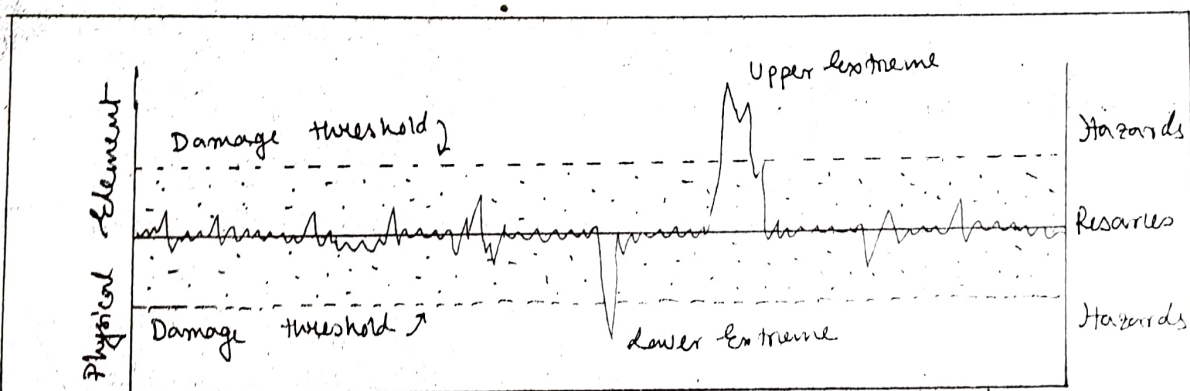
✓ White has defined natural hazards as "an interaction between people and the nature, governed by the co-existent state of adjustment in the human use system, and the state of nature and the natural event system.

Thus, Environmental Hazards are extreme events either natural or man-induced which exceed the tolerable magnitude within or beyond certain time limits, make adjustment difficult, results in losses of property, income and lives. It is a potential threat to humans and their welfare. Hazard is considered as an event that is perceived as brought with danger to life.



The major characteristics of environmental hazards are -

- i) It is not directly caused by humans.
- ii) It does not directly affect humans.
- iii) According to D. Chapman (1986), it is often accompanied by a violent release of energy.
- iv) It is beyond prediction in the short to medium term.



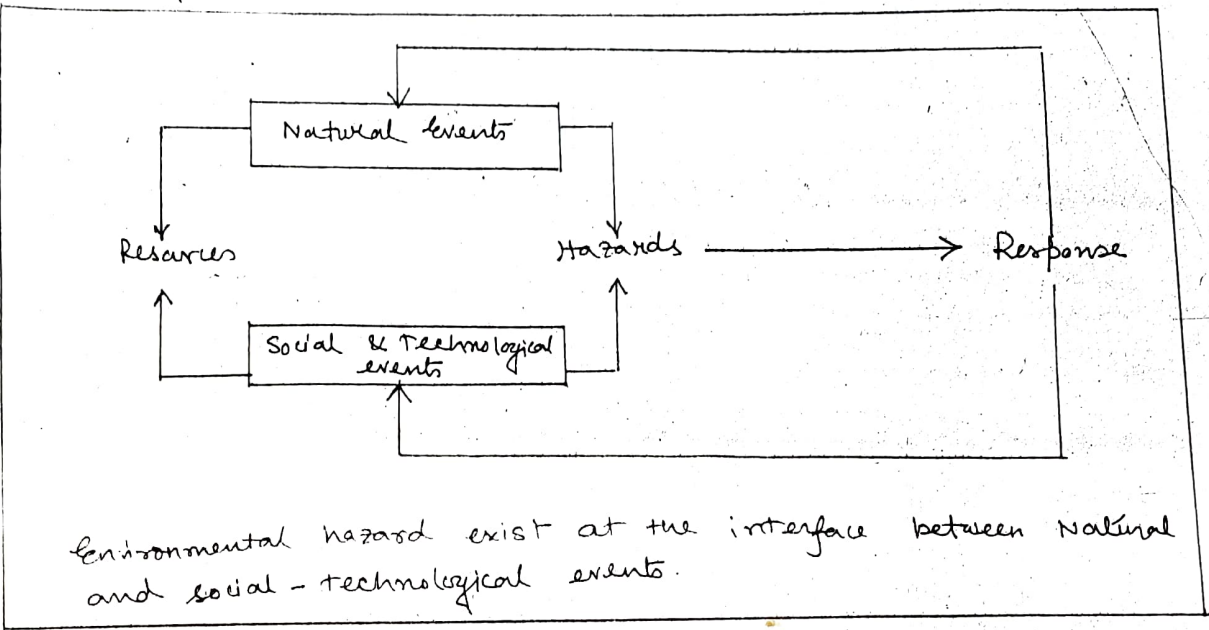
Severity to environmental hazard expressed as a function of the variability of geographical elements and the degree of socio-economic tolerance.

The anthropocentric interpretation of hazard as illustrated in the diagram now shows the shaded zone representing an acceptable range of variation for the magnitude of the physical variable which can be relevant in any environmental condition for human survival, such as rainfall. As long as the environmental element remains fairly close to this expected performance, the elements will be perceived as mainly beneficial. However, when the variability exceeds

Some threshold beyond the normal band of tolerance, the same variable starts to impose damage and become a hazard. Thus, very high or very low rainfall will be deemed to create a flood or drought respectively.

Classification of Environmental Hazards in

The term environmental hazards include both natural and human dimensions. It also implies a spectrum of hazard types. They may range from natural events through technological events to social events.



On the basis of the origin, Environmental hazards can be classified into -

- 1) Natural Hazards
- 2) Manmade Hazards
- 3) Quasi-natural Hazards.

1) Natural Hazards in Natural hazards are normal events of the natural environment that occur suddenly and swiftly and cause immense harm to life and property. These are circumstances that are beyond the control of man. Natural hazards can be analysed on the basis of the physical processes involved in their occurrence.

Natural hazards can be of two types -

i) Geophysical Hazards

ii) Hydro-meteorological Hazards.

i) Geophysical Hazards may be further classified into -

a) Geological Hazards - which are driven by the earth's internal energy
eg. - volcanoes, earthquakes, tsunamis etc.

b) Geomorphological Hazards - which are driven by land surface processes eg. -
landslides and Avalanches.

ii) Hydro-meteorological Hazards are driven by the sun's energy. eg. There are of two types -

a) Abnormal or infrequent Hazards :-
eg. - Cyclone, lightning, Hailstorm etc.

b) Cumulative atmospheric Hazards :-

eg. → Floods, Droughts, Coldwaves, warmwaves

2) Man-made Hazards :- These are caused by undesirable activities of

man. Such hazards mostly affect urban environment.

Any hazard caused by man which inflicts irreparable damage to the mankind is called man-made or man induced hazard.

Man made hazards one of ^{various} ~~four~~ types -

a) Physical :- e.g. Earthquake, Landslide, soil erosion etc.

b) Chemical :- e.g. Release of toxic chemicals to the environment, pollution (soil, water, air, noise etc.), nuclear explosion etc.

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c) Biological :- Population explosion, eutrophication, ~~atmosphere~~ ^{loss of} deforestation, desertification, Salinisation, poverty

d) Socio-economic :- Explosion, War and civil strife, Terrorism etc. Insurgency, Armed aggression etc.

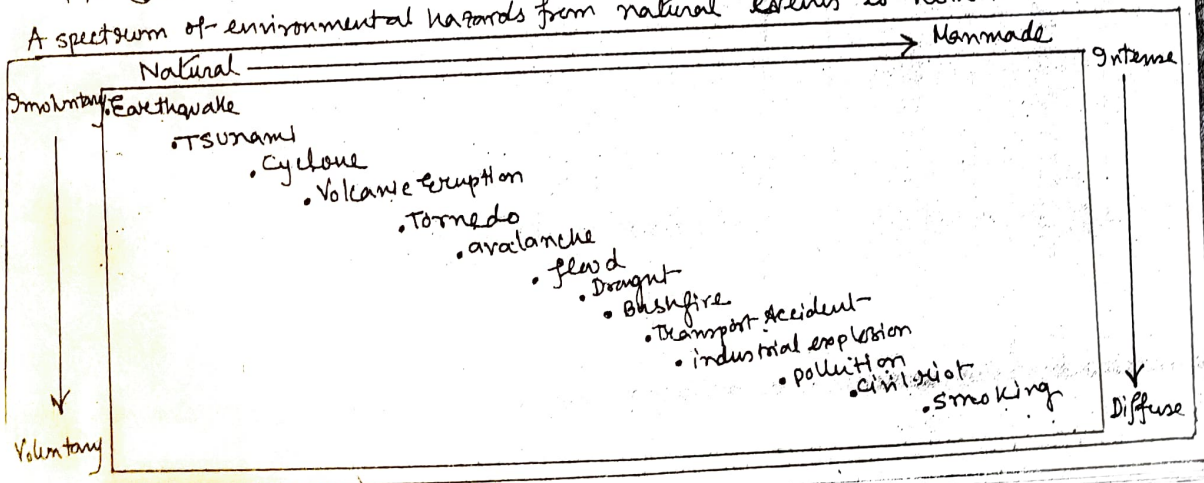
e) Hydro-meteorological :- Flood, Drought, Ground water contamination etc.

f) Industrial & technological :- dam failures, accidents, Spillages, Explosion, fires etc, Gas leak, radiation etc.

g) Quasi-Natural Hazards :- Quasi natural hazards are caused by the combined effect

of natural forces and misdeeds of man. Such hazards involve the operation of - both the geophysical, hydro-meteorological systems with biophysical systems but which may have been indirectly triggered and/or exacerbated by human action. At present, most of the ~~has~~ environmental hazards have become Quasi natural in nature. For example, the frequency and intensity of floods and droughts may increase due to indiscriminate felling of trees, particularly in catchment areas of the rivers.

A spectrum of environmental hazards from natural events to human activities.



DISASTER :-

Extreme form of hazard leads to disaster. The term disaster is derived from two French words, 'des' meaning 'Bad' and 'aster' meaning 'star'. It is a man-made or natural event which results in widespread loss of life and property. Thus, disaster is defined as - "a serious disruption of the functioning of a society, causing widespread human, material or environmental losses which exceed the ability of the affected society to cope using its own resources."

Disaster is an event or a series of events which gives rise to casualties and damage or loss of property, infrastructure, essential services or means of livelihood on a scale that is beyond the normal capacity of the affected communities to cope with unaided.

Disaster implies a sudden calamity that directly affects human beings causing social disruption and material damage.

According to the World Disaster Report, "Disaster is a situation or event which overwhelms local capacity necessitating a request to national or international level for external assistance. For an event to be registered as a disaster requires some conditions. These are -

- i) 10 or more people reported killed,
- ii) 1000 or more people reported injured,
- iii) A call for international assistance,
- iv) Declaration of a state of emergencies.

The World Bank regards disaster as an extraordinary event of limited duration or strictly speaking, a natural event causing serious disruption of country's economy.

Michaelides has sort to define a natural disaster on basis of casualties in the people informed, if 1000 to 1 million people are dead or be in an immediate danger or death, then it would be called the event of natural disaster.

WHO (World Health Organisation) has defined Disaster as any recurrence causing damage, ecological disruption, loss of human life, deterioration of health and health services on a scale sufficient to warrant any extraordinary intervention from outside the affected community.

WMO (World Meteorological Organisation) defines natural disaster as catastrophic consequence of natural phenomena or a combination of phenomena resulting in injury, loss of life in a relatively large scale and some disruptions to human activity.

Disasters are usually assessed on some quantitative criteria of death and damage. In an early attempt at the definition of global natural disasters, Sheehan and Hewitt (1969) included all events which caused -

- i) at least 10 people dead or
- ii) at least 100 people injured or
- iii) at least US \$1 million damage.

However this definition ^{occurs} has drawbacks. For example, spatial difference in wealth exposed to damage between Less Developed Countries and Developed Countries,

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UNDR0 (1984) defined a disaster more qualitatively as an event, concentrated in time and space, in which a community undergoes severe dangers and incurs such losses to its members and physical appurtenances that the social structure is disrupted and the fulfilment of all or some of the essential functions of the society is prevented.

This definition conveys a better idea of the social stress created by a disaster. Although community loss is the major characteristic of disasters, all these definitions ignore the fact that, in virtually every disaster, some gains also arise.

List of disaster types recorded in EM-DAT :-

Accident	Earthquake	Insect Infestation
Avalanche	Epidemic	Landslide
Chemical accident	Famine	Storm
Civil strife	Flood	Tsunami
Cyclone	Heat/Cold wave	Typhoon
Drought	Hurricane	Volcanic eruption

Source :- After Spait & Miston (1992).



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Tectonic (Earthquake, volcanoes)
Topographic (Landslide, avalanches)
Meteorological (Flood, drought, hurricane, cyclones)

Infectious (epidemic)
Human (Indus accident, nuclear bombs).