

CHAPTER-1

INTRODUCTION

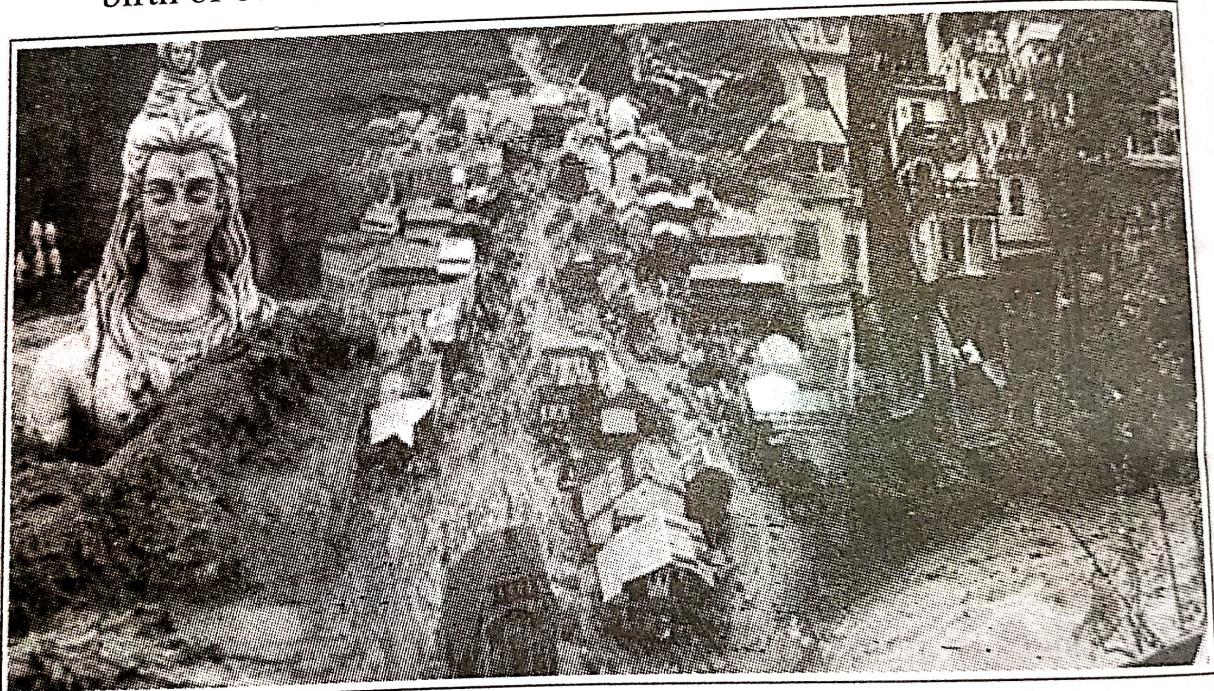
Concepts of Hazard, Vulnerability, Risks, Factors affecting Vulnerabilities, Hazard and Vulnerability profile of India

1. Disaster

Disaster-the word used by the French, Greek, Italian and other ancestors, which meant for a *situation, whenever the alignment of stars are in bad position*, a bad event will happen (prefix dis- "bad" + aster "star").

- A disaster can be defined as "*A serious disruption in the functioning of the community or a society causing wide spread material, economic, social or environmental losses which exceed the ability of the affected society to cope using its own resources*".
- A disaster is a result from the combination of hazard, vulnerability and insufficient capacity or measures to reduce the potential chances of risk.
- A disaster happens when a hazard impacts on the vulnerable population and causes damage, casualties and disruption.
- From the **societal point of view**, an extreme event within the Earth's system that results in death, injury to humans and damage or loss of valuable goods is called as a '**Disaster**'.
- Scientifically, behind every **natural disaster** that occurred on the **Earth's surface**, at least a single, or a multiple **Geological phenomenon or Earth System processes** are there in an active, continuous, systematic and in a cyclic manner.

- These **geological** phenomenon or processes vulnerable to human and other living being, their property as well as environment are known as 'Geo-hazards'. i.
- Whenever a society is facing a huge loss or damage to the life and/or the human's property and/or damage to its environment due to geo-hazards, then that event is called as a 'natural disaster'.
- For example, **lightening** and **thundering hitting** a vacant land, huge landslides or **glacial avalanches** in a non-habited interior mountain belts, heavy flood amidst a forest are all geo-hazards but these are not turned to disasters till there is no such destruction to the human's life or his property.
- But, it is very clear from the Geological facts and findings that, all the natural disasters are the results of the continuous, ongoing and cyclic Earth System Processes that are happening from the birth of our mother Earth, i.e., for the past 4.5 billion years. ii.



Source: Uttarakhand tragedy: haunted India on 16 Jun, 2013, News Nation

2. Hazards and their classification

- Hazard may be defined as "*a dangerous condition or event, that offers threat or have the potential for causing injury to life or damage to property or the environment.*"
 - The word 'hazard' owes its origin to the word 'hasard' in old French and 'az-zahr' in Arabic meaning 'chance' or 'luck'.
- A.** Hazards, **based on origin** can be classified into two broad categories namely **Natural and Man-made**.

i. Natural hazards

- Hazards which are caused by natural phenomena (i.e. hazards with meteorological, geological or even biological origin) are called **Natural Hazards**.
- For examples, **cyclones, tsunamis, earthquake and volcanic eruption** which are absolutely of natural origin.
- **Landslides, floods, drought, fires** are socio-natural hazards since their causes can be both natural and man-made.
- As flooding may be caused because of heavy rains, landslide or blocking of drains with human waste.

ii. Manmade hazards/ Anthropogenic Hazards:

- Hazards which are caused due to human negligence and mainly associated with industries or energy generation facilities and include explosions, leakage of toxic waste, pollution, dam failure, wars or civil strife etc. are called **Man-made hazards**.
- The list of such hazards is very long. Many of them occur frequently while others take place occasionally. However, on the basis of their genesis, they can be categorized as follows:

Table:1.1-Various types of hazards

Types	Hazards		
Geological Hazards	1. Earthquake 2. Tsunami 3. Volcanic eruption	4. Landslide 5. Dam burst 6. Mine Fire	
Water & Climatic Hazards	1. Tropical Cyclone 2. Tornado and Hurricane 3. Floods 4. Drought 5. Hailstorm	6. Cloudburst 7. Landslide 8. Heat & Cold wave 9. Snow Avalanche 10. Sea erosion	
Environmental Hazards	1. Environmental pollutions 2. Deforestation	3. Desertification 4. Pest Infection	
Biological	1. Human/Animal Epidemics 2. Pest attacks	3. Food Poisoning 4. Weapons of Mass Destruction	

Types	Hazards			
Chemical, Industrial and Nuclear Accidents	1. Chemical disasters 2. Industrial disasters	3. Oil spills/Fires 4. Nuclear		
Accident related	1. Boat / Road / Train accidents / air crash Rural / Urban fires Bomb / serial bomb blasts 2. Forest fires	3. Building collapse 4. Electric Accidents 5. Festival related disasters 6. Mine flooding		

Further Anthropogenic Hazards are classified as:

a. **Technological Hazard:** Hazards originating from technological or industrial accidents, dangerous procedures, infrastructure failures or specific human activities that may cause the loss of life or injury, property damage, social and economic disruption or environmental degradation.

Examples of technological hazards include industrial pollution, nuclear radiation, toxic wastes, dam failures, transport, industrial or technological accidents (explosions, fires, chemical spills).

Technological hazards are an increasing source of risk to people and their environment. This is an effect of the globalization of production, an increase of industrialization and a certain level of risk of accidents connected with production, processes, transportation and waste management. These risks are associated with the release of substances in accident condition or with the production of such substances under certain conditions as fire. Substances which could affect human health or the environment by contamination and their effects on animals and plants.

The following type of actions which can contribute technological hazards :

- release of chemicals to the atmosphere by explosion, fire
- release of chemicals into water (groundwater, rivers etc.) by tank rupture, pipeline rupture, chemicals dissolved in water (fire), oil spills in marine environment
- satellite crash (radionuclides)
- radioactive sources in metallurgical processes
- other sources of releases of radionuclides to the environment
- contamination by waste management activities
- soil contamination

- accidents with groundwater contamination (road, rail)
- groundwater contamination by waste dumps (slowly moving contamination)
- aircraft accidents
- releases and contaminations as a consequence of military actions (e.g. depleted uranium), or destruction of facilities
- releases as consequence of the industrial use of biological material (e.g. viruses, bacteria, fungi)

b. **Sociological:** This type of Hazard occurs due to sociological issues, and caused by unconsciously overlooking a hazard, a failure to notice or by purposeful intent by human inaction or neglect, consequences as a result of little or no preventative actions to prevent a hazard from occurring. Sociological hazards include crime, terrorist threats, civil disorder, and war.

c. **Environmental Hazard:** Any single or combination of toxic chemical, biological, or physical agents in the environment, resulting from human activities or natural processes, that may impact the health of exposed subjects, including pollutants such as heavy metals, pesticides, biological contaminants, toxic waste, industrial and home chemicals. Examples includes, all type of pollutions, Climate change, Ozone layer depletion etc.

B. **Based on Energy,** can be classified into following categories:

i. **Biological hazard:** Biological hazards, also known as biohazards, originate in biological processes of living organisms, and refer to agents that pose a threat to the health of living organisms, the security of property, or the health of the environment. Biological hazards include viruses, parasites, bacteria, food, fungi, and foreign toxins.

ii. **Chemical hazard:** A chemical can be considered a hazard if by virtue of its intrinsic properties it can cause harm or danger to humans, property, or the environment.

- Health hazards associated with chemicals are dependent on the dose or amount of the chemical. For example, iodine in the form of potassium iodate is used to produce iodised salt. When applied at a rate of 20 mg of potassium iodate per 1000 mg of table salt, the chemical is beneficial in preventing goiter, while iodine intakes of 1200-9500 mg in one dose have been reported known to cause death.

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- Some chemicals have a cumulative biological effect, while others are metabolically eliminated over time. Other chemical hazards may depend on concentration or total quantity for their effects.
- A variety of chemical hazards (e.g. DDT, atrazine, etc.) have been identified. However, every year companies produce more new chemicals to fill new needs or to take the place of older, less effective chemicals.

- Mechanical Hazard:** A mechanical hazard is any hazard involving a machine or industrial process. Motor vehicles, aircraft, and air bags pose mechanical hazards. Compressed gases or liquids can also be considered a mechanical hazard. Hazard identification of new machines and/or industrial processes occurs at various stages in the design of the new machine or process.
- Physical hazard:** A physical hazard is a naturally occurring process that has the potential to create loss or damage. Physical hazards include earthquakes, floods, fires, and tornadoes. Physical hazards often have both human and natural elements.
- Psychosocial hazard:** Psychological or psychosocial hazards are hazards that affect the psychological well-being of people, including their ability to participate in a work environment among other people. Psychosocial hazards are related to the way work is designed, organized and managed, as well as the economic and social contexts of work and are associated with psychiatric, psychological and/or physical injury or illness.

Based on effects, can be classified into following categories:

- Health hazard:** Hazards that affect the health of exposed persons, and have an acute or chronic illness as the consequence. Fatality would not normally be an immediate consequence. Health hazards may cause measurable changes in the body which are generally indicated by the development of signs and symptoms in the exposed persons, or non-measurable, subjective symptoms.
- Safety hazard:** Hazards affecting the safety of individuals, usually having an injury or immediate fatality as the consequence of an incident.
- Economic hazards:** Hazards affecting property, wealth and the economy.

iv. **Environmental Hazards:** Hazards affecting the environment, particularly the natural environment and ecosystems.

Consequences/effects of Hazards:

The variety of possible situations generating displaced people makes generalizations difficult, but the following may be experienced in varying degrees:

- Loss of means of livelihood.
- Communities becoming separated from services previously provided.
- Loss of normal sources of food.
- Lack of shelter and household necessities.
- Lack of fuel for cooking.
- Lack of potable water.
- Communicable diseases and over-crowding.
- Additional burdens for women, especially as heads of households.
- Large numbers of unaccompanied children separated from family.
- Loss of land and tenure.
- Possible communication and logistics problems.
- Insecurity due to tensions and military activities

3. Vulnerability

Vulnerability may be defined as "*The extent to which a community, structure, services or geographic area is likely to be damaged or disrupted by the impact of particular hazard, on account of their nature, construction and proximity to hazardous terrains or a disaster prone area*".

3.1. Classification of Vulnerabilities:

The degree to which a population is affected by a hazard lie in the physical components of vulnerability as well on socio-economic conditions. Therefore, Vulnerabilities may be classified in two ways:

i. Physical Vulnerability:

- It includes notions of **who** and **what** may be damaged or destroyed by natural hazard such as earthquakes or floods.

- It is based on the physical condition of people and elements at risk, such as buildings, infrastructure etc; and their proximity, location, nature of hazard.
- It also relates to the technical capability of building and structures to resist the forces acting upon them during a hazard event.
- In case of an earthquake or landslide the ground may fail and the houses on the top may topple or slide and affect the settlements at the lower level even if they are designed well for earthquake forces.
- Physical vulnerability includes the difficulty in access to water resources, means of communications, hospitals, police stations, fire brigades, roads, bridges and exits of a building or/an area, in case of disasters. Furthermore, the lack of proper planning and implementation in construction of residential and commercial buildings results in buildings that are weaker and vulnerable in earthquakes, floods, landslides and other hazards.

ii. Socio-economic Vulnerability:

- The socio-economic condition of the people also determines the intensity of the impact. For example, poor people living in the sea coast don't have the money to construct strong concrete houses. They are generally at risk and lose their shelters whenever there is strong wind or cyclone.
- Because of their poverty, they too are not able to rebuild their safe areas and their houses are built with stronger materials. However, even when everything is destroyed they have the capacity to cope up with it.
- Hazards are always widespread, but the hazard becomes a disaster only when there is greater vulnerability and less of capacity to cope with it. In other words the frequency or likelihood of a hazard and the vulnerability of the community increases the risk of being houses.

a. **Economic Vulnerability:** Economic vulnerability of a community can be assessed by determining how varied its sources of income are, the ease of access and control over means of production (e.g. farmland, livestock, irrigation, capital etc.), adequacy of economic fall back mechanisms and the availability of natural resources in the area.

b. Social Vulnerability: A socially vulnerable community has weak family structures, lack of leadership for decision making and conflict resolution, unequal participation in decision making, weak or no community organizations, and the one in which people are discriminated on racial, ethnic, linguistic or religious basis. Other social factors such as culture, tradition, religion, local norms and values, economic standard, and political accountability also play a vital role determining the social vulnerability of a community.

iii. Attitudinal Vulnerability

Communities which has negative attitude towards change and lacks initiative in life resultantly become more and more dependent on external support. They cannot act independently. Their sources of livelihood do not have variety, lacks entrepreneurship and do not possess the concept of collectivism. This brings about disunity and individualism in the society. Thus, they become victims of conflicts, hopelessness and pessimism which reduce their capacity of coping with a disaster.

3.2. Characteristics of Vulnerability:

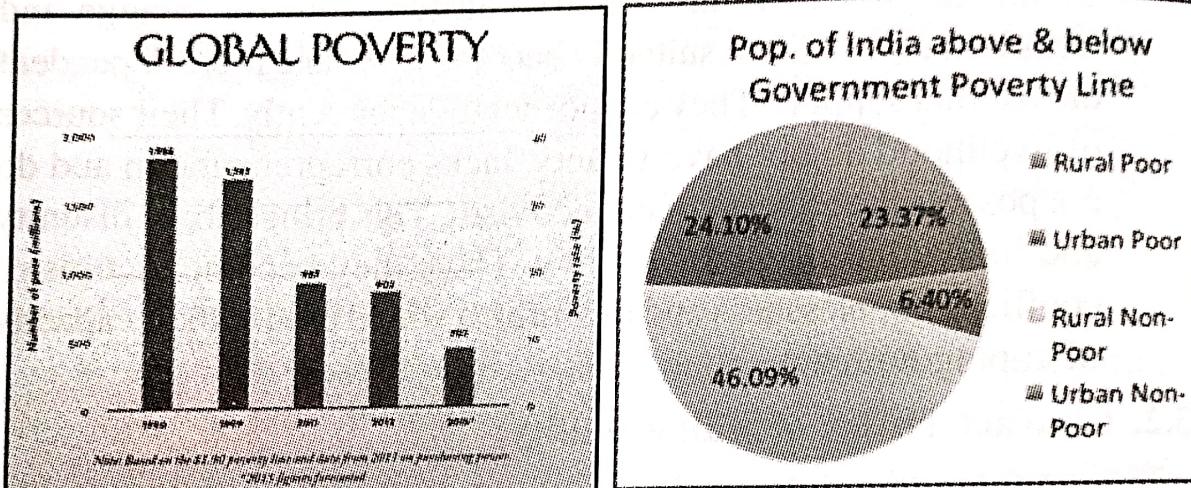
- i. **Multi-dimensional:** One of the characteristics of vulnerability is that it is multi-dimensional, that is it can be categorized as physical, social, economic, environmental, institutional, and even human factors can define vulnerability
- ii. **Dynamic:** Vulnerability changes over time and from one disaster to another disaster.
- iii. **Scale-Dependent:** Vulnerability can be expressed in different scales from human to household to community to country resolution;
- iv. **Site-Specific:** Every site and locality has its own vulnerability and is different from the other ones.

Factors contributing to Vulnerability

i. Poverty:

- The widening gap between rich and poor, rural and urban incomes and hence the disparity in living standards can be witnessed in the flood plains of developing countries.

- For small landowners with marginal, degraded land, frequent flooding can decrease the returns from cultivating the land, thus reducing food security.
- The rural poor who depend on incomes from farming or other agricultural activities, with no reserves to help them get back on their feet after a disturbance or pay for basic needs, are often obliged to migrate to the cities and are driven into debt.
- Newcomers to an urban setting, not being able to afford safe locations in the city, are obliged to settle in temporary residence in relaxed settlements on unimportant lands near the river or other drainages where they are extremely vulnerable to flooding.



Global Poverty and Poverty in India statistics, 2015;

Source: World bank, Asian development bank

ii. Livelihoods:

- The principal livelihoods of community living in rural flood plains are mainly farming and fishing. However, frequent floods threaten their stability of the livelihoods owing to the loss of farm products or limited access to the markets for their products in the absence of sufficient transport infrastructure.
- The landless poor, working as hired laborers, particularly during long flood seasons, have trouble finding jobs to meet their basic needs.

iii. Cultural beliefs:

Some cultural beliefs and philosophical attitudes contribute to a community's vulnerability. In some societies, natural disasters are considered to be acts of God and taken as if there is nothing human beings could do to prevent hazards from turning into disasters. Lack of faith in the social system and lack of confidence

in the ability to manage flood risks evident itself in resistance to any such change.

Equity:

- iv.
 - Unequal distribution of resources and access to human rights can lead to conflicts and discontent, and in turn, the weakening of social systems.
 - For example, individuals who are denied the right to freedom of association and access to information may be prohibited from discussing issues related to flood preparedness and mitigation planning, receiving essential fundamental services and taking preventive measures to protect themselves from flood hazards.
 - In areas where flood diversion works are in place it may so happen that flood water are redirected into areas where poorer sections of the society with less political influence settle.

INEQUALITY WATCH

WORLD BANK DATA SHOW POVERTY GAINS WERE NOT FULLY SUSTAINED BETWEEN 2004-2005 AND 2009-2010

40% of India's poor moved above the poverty line

11% of poor, vulnerable entered the middle class

14% of non-poor group slipped back into poverty

HOW CHILDREN OF POOR FARED IN EMPLOYMENT

- ▶ 36% of children of farmers employed as skilled, semiskilled or white-collar workers
- ▶ 40% of children of unskilled workers engaged in skill-based occupations

Source: Addressing Inequality in South Asia Report

v. Gender inequity:

- In societies where the decision-making power resides only with the men of the family, ignoring the wisdom and experience of women and denying or limiting them the adequate access to knowledge and capacity development schemes, which otherwise may be available to men, can deny the society the use of such human resources and contribute to women's vulnerability in terms of personal security, health and well being, economic security and livelihoods.

4. Capacity

- Capacity can be defined as "resources, means and strengths which exist in households and communities and which enable them to cope with, withstand, prepare for, prevent, mitigate or quickly recover from a disaster". People's capacity can also be taken into account.
- Some examples of capacity are: permanent houses, ownership of land, adequate food and income sources, family and community support in times of crisis, local knowledge, good leadership etc.
- Capacity may include physical, institutional, social or economic means as well as skilled personal or collective attributes such as leadership and management.
- Capacity may also be described as capability.

Types of Capacities: A combination of all the strengths and resources available within a community, society or organization that can reduce the level of risk, or the effects of a disaster.

i. Physical Capacity:

- People whose houses have been destroyed by the cyclone or crops have been destroyed by the flood can salvage things from their homes and from their farms.
- Some family members have skills, which enable them to find employment if they migrate, either temporarily or permanently.

ii. Social Capacity:

- Social capacity includes the interpersonal and intrapersonal links in the community, relations and motivations among the people and the amount of interaction between people.
- During and after a disaster has struck in an area the ability of the local people to take action and guarantee the sustainability of the ongoing projects.
- In some areas communities have organized themselves on street-level or village level and have built small organizations for help in case of disasters or carrying out other welfare activities in the area on volunteering basis e.g. CSO, youth organizations, CBOs etc.

iii. Economic Capacity:

Economics capacity comprises of the income of the community or an area, their savings, earnings, production, business activities and availability of jobs and livelihoods. This capacity also includes employable skills like mining, weaving, etc. GDP/ GNP of an area describe its economic capacity.

iv. Attitudinal Capacity

- People fight and resist against plans and strategies that are not in line with their culture, ideology or religion and this can limit their capacity and increase their vulnerability to disasters.
- Having positive attitude towards involvement of women in community decision making, high awareness on social issues and high motivation for projects which are of mutual benefit for whole of the community can be regarded as an attitudinal capacity of a community.

E.g. if people have 'We perception' instead of 'I perception' this brings a feeling and attitude of collectivism as opposed to individualism in a society.

5. Risk

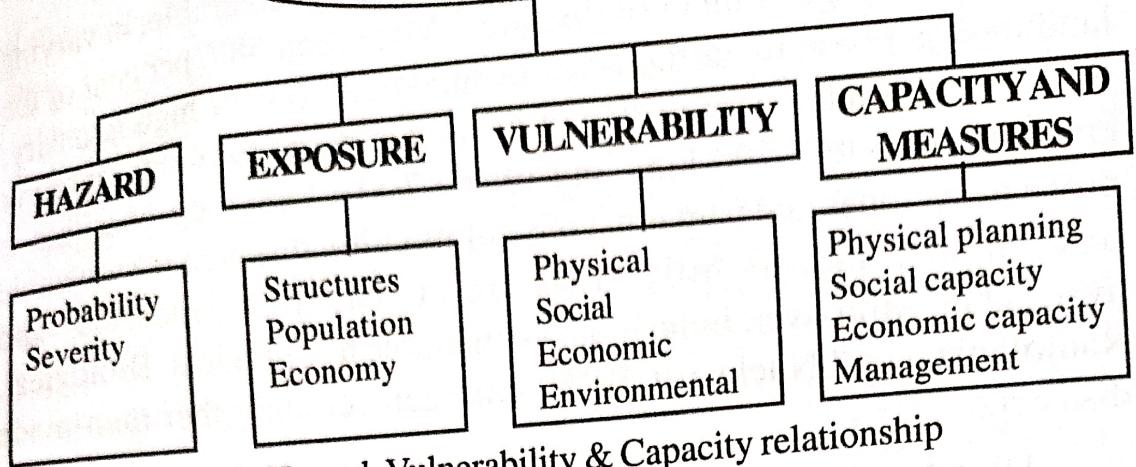
- Risk is a "measure of the expected losses due to a hazard event occurring in a given area over a specific time period.

Or

Risk is a function of the probability of particular hazardous event and the losses each would cause."

- The level of risk depends upon:
 - Nature of the hazard
 - Vulnerability of the elements which are affected
 - Economic value of those elements
- A community/locality is said to be at 'risk' when it is exposed to hazards and is likely to be adversely affected by its impact. Whenever we discuss 'disaster management' it is basically 'disaster risk management'.
- Disaster risk management includes all measures which reduce disaster related losses of life, property or assets by either reducing the hazard or vulnerability of the elements at risk.

Disaster Risk



Risk, Hazard, Vulnerability & Capacity relationship

$$\text{Risk} = \frac{\text{Hazard} \times \text{Vulnerability}}{\text{Capacity}}$$

Difference between Hazard and Disaster

Hazard	Disaster
A dangerous situation needing to be heeded because it can lead to a disaster.	A dangerous situation that has become out of control and is a disaster
A threat that can be managed by observing warning signs and keeping in harmony with the environment.	An international danger and threat to humanity that needs intervention to bring the situation under control.
Hazards are known to have specific warnings usually man-made to prevent disastrous events.	Disasters are the outcomes of hazards when warning signs were ignored.
Hazards can lead to disasters.	A disaster is the result of a hazard but at the same time is also a hazardous event.
Hazards are not used to describe everyday mishaps. They are specific occurrences and danger areas with appropriate warning signs.	Disasters, although in literal terms are more severe than hazards are used to describe events that are not literally of a disastrous nature but rather an idiomatic use of the word.

Hazard and Vulnerability Profile in India

1. Vulnerability profile of India: India is vulnerable, in varying degrees, to a large number of disasters. More than 58.6 per cent of the landmass is prone to earthquakes of moderate to very high intensity; over 40 million hectares (12%) of its land is prone to floods and river erosion; close to 5,700 kms, out of the 7,516 kms long coastline is prone to cyclones and tsunamis; 68% of its cultivable area is vulnerable to droughts; and, its hilly areas are at risk from landslides and avalanches. Moreover, India is also vulnerable to Chemical, Biological, Radiological and Nuclear (CBRN) emergencies and other man-made disasters.

Disaster risks in India are further compounded by increasing vulnerabilities related to changing demographics and socio-economic conditions, unplanned urbanization, development within high-risk zones, environmental degradation, climate change, geological hazards, epidemics and pandemics. Clearly, all these contribute to a situation where disasters seriously threaten India's economy, its population and sustainable development.

In India, Ministry of Statistics and Programme Implementation has taken initiatives for collection of data in respect of different disasters. A Technical Committee was constituted by the Central Statistics Office with a view to prepare a framework for disaster statistics for developing a database on disaster and related aspects. Five formats have been developed for capturing the information about:

- (i) Statistics on disaster at district level,
- (ii) Statistics on relief, rehabilitation and reconstruction at district level,
- (iii) District wise compilation of statistics on disaster,
- (iv) District wise compilation of statistics on relief, rehabilitation and reconstruction and
- (v) Aggregation of damage and relief data at state level.

The state Government and District level institutions would be required to furnish this information for preparing the data base at centralized level.

Table 1: India's Deadliest Disasters

S. No.	Name of Event	Year	State & Area	Fatalities
1.	Floods	October 2014	Jammu & Kashmir	
2.	Cyclone Hud Hud	September 2014	Andhra Pradesh & Odisha	
3.	Odisha Floods	October 2013	Odisha	21
4.	Andhra Floods	October 2013	Andhra Pradesh	53
5.	Cyclone Phailin	October 2013	Odisha and Andhra Pradesh	23
6.	Floods/ Landslides	June 2013	Uttarakhand and Himachal Pradesh	4,094
7.	Cyclone Mahasen	May 2013	Tamil Nadu	08
8.	Cyclone Nilam	October 2012	Tamil Nadu	65
9.	Uttarakhand Floods	Aug - Sep 2012	Uttarkashi, Rudraprayag and Bageshwar	52
10.	Assam Floods	July - Aug 2012	Assam	—
11.	Cyclone Thane	December 2011	Tamil Nadu, Puducherry	47
12.	Sikkim Earthquake	September 2011	Sikkim, West Bengal, Bihar	60
13.	Odisha Floods	September 2011	19 Districts of Odisha	45
14.	Sikkim Earthquake	2011	North Eastern India with epicenter near Nepal Border and Sikkim	97 people died (75 in Sikkim)
15.	Cloudburst	2010	Leh, Ladakh in J&K	257 people died
16.	Drought	2009	252 Districts in 10 States	—
17.	Krishna Floods	2009	Andhra Pradesh, Karnataka	300 people died

S. No.	Name of Event	Year	State & Area	Fatalities
18.	Kosi Floods	2008	North Bihar	527 deaths, 19,323 livestock perished, 2,23,000 houses damaged, 3.3 million persons affected
19.	Cyclone Nisha	2008	Tamil Nadu	204 deaths
20.	Maharashtra Floods	July 2005	Maharashtra State	1094 deaths 167 injured 54 missing
21.	Kashmir	2005	Mostly Pakistan, Partially Kashmir	1400 deaths in Kashmir (86,000 deaths in total)
22.	Tsunami	2004	Coastline of Tamil Nadu, Kerala, Andhra Pradesh, Pondicherry and Andaman and Nicobar Islands of India	10,749 deaths 5,640 persons missing 2.79 million people affected 11,827 hectares of crops damaged 300,000 fisher folk lost their livelihood
23.	Gujarat Earthquake	2001	Rapar, Bhuj, Bhachau, Anjar, Ahmedabad and Surat in Gujarat State	13,805 deaths 6.3 million people affected
24.	Orissa Super Cyclone	1999	Orissa	Over 10,000 deaths
25.	Cyclone	1996	Andhra Pradesh	1,000 people died, 5,80,000 housed destroyed, Rs. 20.26 billion estimated damage

2. Hazard Profile of India

- (i) India is one of the ten worst disaster prone countries in the world. The country is prone to disasters due to number of factors; both natural and human induced, including:
- adverse geo climatic conditions,
 - topographic features,
 - environmental degradation,
 - population growth,
 - urbanization,
 - industrialization,
 - Non-scientific development practices etc.

The factors either in original or by accelerating the intensity and frequency of disasters are responsible for heavy toll of human lives and disrupting the life supporting system in the country.

As far as the vulnerability to disaster is concerned, the five distinctive regions of the country have their own specific problems:

- Himalayan region,
- the alluvial plains,
- the hilly part of the peninsula, and
- the coastal zone.

While on one hand the Himalayan region is prone to disasters like earthquakes and landslides, the plain is affected by floods almost every year. The desert part of the country is affected by droughts and famine while the coastal zone susceptible to cyclones and storms.

- (ii) The natural geological scenario of the country is the primary basic reason for its increased vulnerability. The geo-tectonic features of the Himalayan region and adjacent alluvial plains make the region susceptible to earthquakes, landslides, water erosion etc. Though, peninsular India is considered to be the most stable portions, but occasional earthquakes in the region shows that geo-tectonic movements are still going on within its depth.
- (iii) The tectonic features, characteristics of the Himalayan regions are prevalent in the alluvial plains of Indus, Ganga and Brahmaputra too, as the rocks lying below the alluvial plains are just extension of the Himalayan ranges only. Thus this region is also quite prone to seismic activities.
As a result of various major river systems flowing from Himalaya and huge quantity of sediment brought by them, the area is also suffering from river channel siltation, resulting into frequent floods, especially in the plains of Uttar Pradesh and Bihar.
- (iv) The western part of the country, including Rajasthan, Gujarat and some parts of Maharashtra are hit very frequently by drought situation. If Monsoon gets worse the situation spreads in other parts of the country too.
The disturbance in the pressure conditions over oceans, results into cyclones in coastal regions. The geo tectonic movements going on in the ocean make the coastal region prone to tsunami disaster too.
- (v) The extreme weather conditions, huge quantity of ice and snow stored in the glaciers etc. are other natural factors which make the country prone to various forms of disasters.
- (vi) Along with the natural factors various human induced activities like:
- increasing demographic pressure,
 - deteriorating environmental conditions deforestation,
 - unscientific development,
 - faulty agricultural practices and grazing,
 - unplanned urbanization,
 - Construction of large dams on river channels etc.

are also responsible for accelerated impact and increase in frequency of disasters in the country

Vulnerability to disasters or emergencies of Chemical, Biological, Radiological and Nuclear (CBRN) origin has increased on account of socio-economic development. Heightened vulnerabilities to disaster risks can be related to expanding population, urbanization and industrialization, development within high-risk zones, environmental degradation and climate change. During the last two decades of the 19th century (1982-2001), natural disasters in India had claimed a total death toll of around 1,07,813 people (on an average more than 5,390 death toll every year). As mentioned above, India with its extended coast line is exposed to five to six tropical cyclones on an average, both from the Arabian Sea and Bay of Bengal annually.

Difference among Accidents, Disasters and Emergency

Accidents	Disasters	Emergency
An unexpected event with negative consequences occurring without the intention of the one suffering the consequences.	An unexpected natural or man-made catastrophe of substantial extent causing significant physical damage or destruction, loss of life or sometimes permanent change to the natural environment.	An emergency is a situation in which normal operations cannot continue and immediate action is required so as to prevent a disaster. It can cause immediate danger to people's lives or might not be immediately life-threatening, and can extend to the wider environment.
Road traffic accidents. Medical negligence. Accidents at work. Slip and fall accident. Assault. Dog bite.	Avalanches and landslides, Earthquakes, Volcanic eruptions, Floods, Tsunami, Blizzards.	Examples include forest fires, oil spills, health emergencies such as cardiac arrests or road accidents and outbreaks of diseases such as cholera.