TOPIC: -

HAZARDS AND DISASTERS IN INDIA

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HAZARDS AND DISASTERS IN INDIA

India is vulnerable to a wide range of natural hazards, particularly flooding, cyclones, drought, extreme heat waves, landslides, wildfire, and earthquakes. Studies show that, as a result of climate change, the intensity, duration and frequency of weather-related shocks are likely to increase.

In 2013, India experienced the double shock of severe flash floods in the state of Uttarakhand and Cyclone Phailin in the state of Odisha. The flooding and associated landslides in Uttarakhand caused over 4,000 deaths and $661 million in <u>damage and loss</u>, resulting in the country's worst disaster since the 2004 tsunami.

In India, vulnerability to natural hazards is exacerbated by high population density and growth in urban and coastal areas.

DIFFERENCE BETWEEN A HAZARD AND A DISASTER: -
Hazard is a condition/event that has potential for causing injury/ loss of life or damage to property/environment.

Disaster is an event that occurs suddenly/unexpectedly in most cases and disrupts the normal course of life in affected area; results in loss or damage to life property or environment and is beyond the coping capacity of local affected population/society and therefore requires external help.

Imagine you are in the desert and earthquake occurs. Now earthquake is a hazard but in open desert it does not make in damage to you. No threat to your life. So it does not become disaster. It remains as a hazard. Now imagine earthquake in a city. There buildings collapse, people die or are injured, normal life is disrupted. This is disaster situation.

A **hazard** is a situation where there is a threat to life, health, environment or property. ...
These **hazards** are termed as **disasters** when they cause widespread destruction of property and human lives. Once a **hazard** becomes active and is no longer just a threat, it becomes a **disaster**.

NATURAL DISASTERS AND HAZARDS:-

A natural disaster is a natural event, such as an earthquake, flood, or hurricane, which negatively affects society, either through damage to property or through loss of life. A natural hazard is a disaster that has not yet occurred. Natural events are often referred to as natural hazards when referring to the general phenomenon, but they are called natural disasters when referring to a specific event, such as the 2004 Indian Ocean earthquake and tsunami or Hurricane Katrina. If a natural event does not pose any risk to human property or lives, it is simply a natural event; hazards and disasters only occur in conjunction with human society.

TYPES OF NATURAL HAZARDS: -

Natural hazards fall into four main categories depending upon the driving forces of the event: geological hazards, atmospheric hazards, hydrological hazards, and biological hazards.

- **Geological hazards** occur because of geological processes such as movement in the tectonic plates and volcanic activity. These events include earthquakes, volcanic eruptions, and landslides.
- **Meteorological hazards** occur as a result of processes in the atmosphere. Meteorological hazards include extreme temperatures, hurricanes, tornadoes, droughts, and severe storms.
- **Hydrological hazards** are hazards involving water processes. Examples include floods, droughts, and tsunamis.
- **Biological hazards** occur due to the biological processes of the earth and primarily involve the spread of diseases and pests. Epidemics, pandemics, and insect swarms all fall into the biological hazards category.

Sometimes, natural hazards can fit into more than one category. For example, an earthquake in the middle of the ocean can also cause a tsunami; this would be a geological and a hydrological disaster because the earthquake (a geological event) caused the tsunami (a hydrological event). Another example is when a volcanic eruption (a geological event) spews ash and dust into the atmosphere to cause lower temperatures (a meteorological event). Natural hazards also fit into three categories that describe the speed and extent of a hazard: catastrophic hazards, rapid onset hazards, and slow onset hazards.

- **Catastrophic hazards** are large-scale that effect large numbers of people or have worldwide effects. Pandemics, large volcanic eruptions, and worldwide droughts are all examples of catastrophic natural hazards.

- **Rapid onset hazards** occur quickly and with little warning. Volcanic eruptions, earthquakes, flash floods, and landslides are examples of rapid onset hazards.

- **Slow onset hazards** occur slowly and may take years to develop. Epidemics, insect infestations, and droughts are all slow onset hazards.

EFFECTS OF NATURAL DISASTERS

The effects of natural disasters are many and varied. Some are short term effects that can be fixed with relative ease while others last for years. Natural disasters have three general types of effects: primary effects, secondary effects, and tertiary effects.

- **PRIMARY EFFECTS** are the direct result of the natural disaster, such as collapsed buildings and water damage.

- **SECONDARY EFFECTS** are the result of primary effects. Examples of secondary effects include power outages due to fallen trees or damaged building and fires from broken gas lines. In these examples, the fallen trees and the damaged building would be primary effects that caused the power outages and fires (secondary effects).

- **TERTIARY EFFECTS** are the long term effects of natural disasters. These include changes in the landscape and natural features, loss of habitat, and crop failure or reduction due to cooler temperatures or other interference.

HUMAN RESPONSES TO NATURAL HAZARDS

Humans have always had to deal with natural hazards; whether through preparing for them

or responding when a disaster occurs. One of the most important ways humans respond to natural

hazards is by preparing for their occurrence. As technology has improved, so has the ability to prepare, predict, and forecast future natural disasters.

- **HAZARD ASSESSMENT** is when scientists study natural hazards to determine characteristics of various hazards. A hazard assessment differs from a risk assessment primarily because and hazard assessment focuses mainly on the natural processes of a possible event while a risk assessment includes a hazard's possible effects on a society. Hazard assessment generally determines the location and timing of past hazardous processes, the severity and frequency of past hazardous processes, probable effects of different processes depending upon the magnitude (severity) of a possible event, and organizing the information into a usable form for officials and policy makers.

- **RISK ASSESSMENT** incorporates the information from a hazard assessment, but also includes possible socio-economic effects. A risk assessment includes locations of buildings and infrastructure in hazardous areas, the potential for exposure due to the physical effects of a hazard, community vulnerability in the event a hazard becomes a disaster, and a hazard assessment.

- A **PREDICTION** is a statement of probability that an event will occur. In terms of natural hazards, predictions are made through various scientific observations. A common observation that could lead to a prediction is the identification of a precursor event. A precursor event is a smaller event that usually precedes a larger event, such as tropical depression leading to a tropical storm before becoming a hurricane or numerous small earthquakes around a volcano indicating an imminent eruption.

- **FORECASTING** is similar to a prediction and is often used synonymously; however, in certain instances a forecast can be slightly different from a prediction. The term forecast is usually used as a short-term prediction of the severity, location, and timing of weather related events. It can also be used for long-term probabilities of an event occurring within a certain time frame. This long term forecasting is not as precise as a weather forecast.

INDIA MOST EXPOSED TONATURAL HAZARDS

The number of people facing significant threats from natural hazards is greatest in South Asia, with earthquakes, flooding and severe storms the main perils, while those in sub Saharan africa are the most vulnerable to them and will have the hardest time recovering because of political instability, corruption and availability of infrastructure and resources to rebuild, according to a new report.

In South Asia nearly 1.4 billion people, or 81% of the region's population, are acutely exposed to at least one type of natural hazard and live in areas considered to have insufficient resources to cope with and rebound from an extreme event, according to a report by risk analysis firm Verisk Maplecroft.

A further 839 million people in East Asia and 565 million in South East Asia are also exposed. The main threat to the population in South Asia stems from severe storms, which include

thunderstorms that can cause torrential rain, high winds and even tornadoes. Floods and earthquakes also pose a significant threat in the region, with 207 million people exposed to floods and 53 million to earthquakes.

At the global level, India has the greatest number of people exposed to natural hazards (1 billion), followed by China (677 million), Indonesia (230 million), United States (206 million) and Nigeria (174 million), the Bath, U.K.-based firm said.

For its survey Verisk Maplecroft assessed the risks posed by 11 types of natural hazards, including tropical cyclones, floods, winter storms, earthquakes, wildfires and tsunamis in 20 new risk indices covering 198 countries. The research is part of its annual Environmental Risk Dataset, which has been developed to help companies identify risks to their assets, personnel and supply chains.

THE FOUR PILLARS OF THE COACHING MINDSET

Per the research, there's a lack of resilience to hazards across the region, especially in India, Pakistan and Bangladesh. The governments of these countries have failed to translate record levels of economic growth into improved resilience against natural hazards, leaving investors open to disruption to economic outputs, risks to business continuity and threats to human capital, the report said.

According to the firm's Natural Hazards Vulnerability Index, which assesses a country's ability to prepare for, respond to, and recover from a natural hazard event, Japan (183) and the U.S. (173) are 'low risk,' and China (126) 'medium risk'. In comparison, the weaker institutional capacity, financial resources and infrastructure of Bangladesh (37), Pakistan (43) and India (49) mean they are rated 'high risk,' leaving companies and populations there under greater threat if a significant event strikes.

Flooding is one of the most substantial risks to communities and business in South Asia, the report said. In India alone, 113 million people, or 9% of the population, are acutely exposed to flood hazard, 76 million in Bangladesh and 10 million in Pakistan. Indeed, heavy monsoon rain in November-December 2015 sparked record flooding in South India, which cost the country upwards of $3 billion and displaced more than 100,000 people.

At a city level, there South Asian cities are in the top 10 most exposed globally. These include the major garment producer Dhaka in Bangladesh (ranked 5th most exposed) and the rapidly growing tech hubs of Kolkata (6) and Delhi (9) in India. Manila, Philippines (1), Tokyo, Japan (2), Jakarta, Indonesia (3), Dongguan, China (4), Osaka, Japan (7), Mexico City, Mexico (8) and Sao Paolo, Brazil (10) complete the list.

"This data highlights the scale of the task facing governments and business in mitigating the threats to populations and workforces from natural hazards in these high risk regions," said Dr James Allan, Director of Environment at Verisk Maplecroft. "With overseas investment pouring into the emerging Asian markets, companies have an increasing responsibility to understand their exposure and work with governments to build resilience."