Natural disasters are generally classified as having hydrological, meteorological, climatic, geophysical or biological causes/origins.

These can be broadly classified as follows:

- Environmental impacts
- Physical Impacts
- Social Impacts
- Ecological impacts
- Economic impacts
- Political impacts

1. Environmental impacts

These impacts vary considerably from disaster to disaster and largely depend on the severity of the disaster as well as the vulnerability of the concerned locality as follows:

Natural Disasters

EARTHQUAKE: This causes tremors as a result of which there is a liquefaction of soil, ground rupture, landslide salination and alteration of flow of streams, flooding of shoreline structures and damage to buildings, bridges, dams and crops. It also causes Tsunamis which causes flooding and destruction.

FLOOD/TSUNAMI: This may cause erosion of top soil, change in the course of streams and rivers and damage to human settlement and property.

DROUGHT: It causes reduced cloud cover, increased daytime temperature, increased evaporation rate, increased likelihoods of dust and sandstorms. There is dramatic reduction in the surface water causing crop losses, food grain shortage, and increased hunger and malnutrition, and losses to livestock.

CYCLONE: It causes rapid flooding, landslides, soil erosion and damage to houses and crops which may increase salinity in sub surface water table.

Manmade Disasters

FIRE: Pollutants emitted from the fire are harmful for the health of living beings and the smoke affects the air quality. It also affects the soil properties and results in soil erosion.
It also causes loss of wild life habitat, loss of biodiversity, loss of natural regeneration and loss to water and other natural resources. Due to fires the vegetation and crops get damaged. Fires not only affect human being, they have a severe impact on the wild life, fishes, insects etc.

NUCLEAR WARFARE: This causes contamination of air, water and soil. The effect of fallout impacts the environment adversely in the nearby regions or countries as well.

BIOLOGICAL WARFARE: Due to the micro organisms which are used as weapons of mass destruction, there is an ill effect on human being, crops, plants and live stock.

CHEMICAL WARFARE/DISASTER: Under this, a liquid, gaseous or solid chemical substance gets released which is harmful for human being, plants and animals.

2. Physical impacts (Medical impacts)

Traumatic injuries: Immediate medical help and even surgical assistance are needed in case of such injuries. The effects may be in the form of severe injuries, burns, effects or fractures etc. depending on the type of disaster. E.g. In case of injury due to nuclear weapon, the severity of impact depends on the weapon size, height of burst, time of day, weather conditions etc.

Epidemic diseases: Even though disasters may not cause immediate threat of epidemic, the source of outbreak as an after effect needs to be identified quickly. The natural disaster such as flood or manmade disasters such as biological warfare can be a cause for this.

Indigenous diseases: Indigenous diseases increase as a result of environmental degradation and pollution/ contamination of food, water and air. E.g. Poor sanitation and garbage disposal as well as water contamination in flood-hit regions may result in an outbreak of diseases such as leptospirosis.

Emotional stress and Psychological impacts: These depend on the age, education level, financial conditions, physical health and coping skills of the affected population. These include psycho-physiological effects such as fatigue, gastrointestinal upset, and tics as well

as cognitive signs such as confusion, impaired concentration, and attention deficits. Psychological impacts include emotional signs such as anxiety, depression, and grief. They also include behavioral effects such as sleep and appetite changes, ritualistic behavior etc.

Health Impacts

Direct health impacts of the disasters include deaths and injuries.

The indirect health impacts of natural disasters include potential for an increase in communicable, waterborne, and other diseases such as hepatitis and malaria as well as pneumonia, eye infections, and skin diseases.

These health issues pose a significant threat to the lives and well-being of disaster survivors.

Deaths often occur from communicable and other diseases after a disaster and for this reason these indirect health impacts are often referred to as the "**second wave of death and destruction**."

Most of the communicable and waterborne diseases that occur, particularly in the aftermath of floods and hurricanes/cyclones in developing countries, are caused by a severe shortage of clean drinking water, non-hygienic living conditions, and lack of food.

Disaster survivors in developing countries generally live in damp, dirty, and cramped conditions in their homes and/or temporary shelters. Such conditions facilitate the spread of numerous adverse health conditions from person to person within the household.

Post-disaster human health is also closely associated with changes in the balance of the natural environment. For example, flooding caused by overflow of river banks and/or by storm surges alters the balance of the natural environment and ecology, allowing vectors of disease and bacteria to flourish. (Cholera and a higher incidence of malaria)

Illnesses are also caused by other indirect impacts of natural disasters such as damaged infrastructure, population displacement, and reduced food production as well

as the release of contaminants (e.g., from storage and waste disposal sites) into the water and air of disaster-impacted areas.

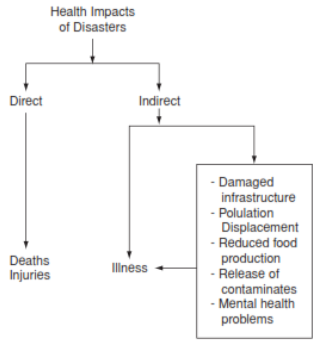

Figure: Health Impacts

Damaged infrastructure refers to all types of health care facilities such as hospitals, medical clinics, and ambulatory services, including the electricity supply on which most of these facilities depend. Lack of proper medical attention may also result from the absence of physicians and other health personnel as well as an insufficient supply of appropriate medicine.

Damage to other infrastructure, such as roads and bridges, may also impact health outcomes. Such damage can cause serious delays (or may even prevent) *the provision of both emergency and regular medical supplies and personnel* for treating injuries or for controlling disease outbreaks.

Restricted access may also prevent the *initiation of emergency immunization programs* and other health interventions that may be required subsequent to a disaster.

Release of contaminants poses serious public health risks, including cancer, for survivors of several natural disasters such as floods. Floodwaters can mix with raw sewage and thus dramatically increase the incidence of waterborne diseases.

Although the release of *toxic chemicals is diluted by floodwater*, causing toxicity levels to decline, uncontrolled release of various chemicals – some of which may interact with each other – poses a considerable public health risk.

A serious threat to public health manifests if waste storage facilities or industrial plants are flooded. In addition, *sediments of flood affected areas are often contaminated with*

toxic substances, such as arsenic, lead, diesel fuel, and polycyclic aromatic hydrocarbons (PAHs), to name but a few.

Contaminated floodwaters that overflow into residential areas may cause long term health effects on humans and animals, and may also result in pollution of groundwater reserves, which is a major source for drinking water

Wildfire smoke, which pollutes the air, is especially harmful to persons of all ages with underlying health conditions such as asthma, emphysema, and cardiovascular diseases.

Smoke can aggravate pre-existing heart disease that may result in symptoms such as chest pain. In healthy individuals, wildfire smoke usually causes irritation of the eyes, nose, and throat, and/or breathing discomfort or difficulty. Wildfire smoke contains more than 90% of carbon dioxide and water, but hundreds of other chemicals (e.g., carbon monoxide, mercury, sulfur dioxide, PAHs, and nitrogen oxides) can also be present.

Indirect longer term health impact of natural disasters is associated with *mental health*. In those areas affected by extreme events, the related trauma tends to have a rather lengthy impact on the population's wellbeing, both directly and indirectly.

Direct consequences may be observed in the form of *lifetime disabilities*. Indirect outcomes manifest in society through *individual breakdowns* that lead to stress-related illness, such as depression and sleep disorders. Stress also exacerbates many chronic diseases such as diabetes, pregnancy, heart conditions, even obesity.

Psychological Impacts

Psychological health impacts of natural disasters do not uniformly affect all segments of a population. Distress, Flash backs, Hatred/Revenge, Guilt feeling, Lack of trust, Helplessness and Hopelessness.

Children, the elderly, people with pre-existing mental illness, racial and ethnic minorities, and families of those who have died in the disaster are more affected than other segments of population.

Emergency workers also often suffer from psychological problems because they work long hours even without breaks and witness horrific sights.

SHOCK

In the immediate aftermath of a natural disaster, the first reaction is often a combination of shock and denial. Sometimes this can make it challenging to take the necessary steps to begin picking up the pieces—calling insurance, assessing what property was lost, even finding temporary housing. But shock tends to give way to much stronger feelings, which can hit days, weeks, or months after a disaster strikes.

FEELINGS OF INSECURITY

Home is a place that most people spend their entire lives believing is a place of safety and refuge. But when a storm comes tearing through your house, this security can go out the window. People who have survived storms may experience nightmares, anxiety, extreme concerns about storm safety, or obsessive preparation to avoid the next disaster. The insecurity can be especially pronounced in children, who may feel constantly unsafe.

POSTTRAUMATIC STRESS

Extreme stress is common in the aftermath of a storm. But when it persists for months, it can lead to posttraumatic stress (PTSD). People with PTSD may experience flashbacks to the storms, panic attacks, and an extreme startle reflex, persistent avoidance of things that remind them of the storm, and anxiety and depression. PTSD can also interfere with a person's ability to control emotions, leading to angry outbursts or crying spells, for example.

Economic Impacts

Loss of life, Un employment, Loss of livelihood, Loss of property/land, Loss of household articles, Loss of crops and Loss of public infrastructure.

Property damage caused by disaster impacts often has *severe economic consequences*. This damage is expressed in asset values that can be measured by the cost of repair or replacement. *Measuring property damage* is usually not difficult because most such damages are *direct economic* losses. For insured property, the insurers record the amount of the deductible and reimbursed loss, but uninsured losses are not recorded.

Economic impacts are wide ranging – they affect financial ability and condition of individuals, households, the impacted community and/or region, or even a nation. For example, the overall economic impact of Hurricane Katrina was estimated to be about US$150 billion, making it the costliest natural disaster in the history of the United States.

Major factors that contributed to such an extensive economic impact were reductions in oil supply, food export, tourism, and other forms of trade business. The Gulf Coast contributes about 10% of the nation's oil supply and was severely disrupted due to impacts associated with Hurricane Katrina.

Direct and indirect loss are include cost of repair or replacement of damaged or destroyed structures, loss of agriculture/inventory, cleanup costs, and loss of income and rental costs. Indirect impacts include reduction in business and personal spending. This impact often lasts longer than direct impacts. (Damage to infrastructure continues to disrupt business activities for a relatively long time relative to damage to a specific business or even a specific retail sector, e.g. food restaurants)