

Research Article

## **Climate Change and its affects**

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### **What is Climate change?**

Climate change refers to long-term shifts in temperatures and weather patterns. These shifts may be natural, such as through variations in the solar cycle. But since the 1800s, human activities have been the main driver of climate change, primarily due to burning fossil fuels like coal, oil and gas.

Burning fossil fuels generates greenhouse gas emissions that act like a blanket wrapped around the Earth, trapping the sun's heat and raising temperatures. Examples of greenhouse gas emissions that are causing climate change include carbon dioxide and methane. These come from using gasoline for driving a car or coal for heating a building, for example. Clearing land and forests can also release carbon dioxide. Landfills for garbage are a major source of methane emissions. Energy, industry, transport, buildings, agriculture and land use are among the main emitters.

### **Recent Research in Climate change**

Emissions continue to rise and as a result, the Earth is now about 1.1°C warmer than it was in the late 1800s. The last decade (2011-2020) was the warmest on record.

Many people believe that climate change primarily entails higher temperatures. However, the rise in temperature is merely the beginning of the narrative. Changes in one place can influence changes in all others since the Earth is a system in which everything is connected.

### **Climate change causes**

Natural and man-made climate change causes can be separated into two categories.

Natural occurrences: Climate change is the result of a number of natural forces.

Continental drift, volcanoes, ocean currents, and the earth's tilt are all major variables.

#### Human causes:

##### **Greenhouse Effect**

The sun provides energy to the planet, which warms its surface. A portion of this energy (about 30%) is scattered as it passes through the atmosphere. The land and ocean surfaces reflect some of this energy back into the atmosphere. Certain gases in the atmosphere act like a blanket around the globe, absorbing some of the energy. These gases, which include carbon dioxide, methane, and nitrous oxide, as well as water vapour, make up less than 1% of the atmosphere. Greenhouse gases are what they're called. This 'gas blanket' absorbs some of the energy emitted by the planet and maintains temperature levels, similar to how the glass of a greenhouse stops excess energy from being radiated. As a result, it's known as the 'greenhouse effect.'

The greenhouse effect was first recognized by the French scientist Jean Baptist Fourier. He pointed out the similarities between what happens in the atmosphere and what happens in the greenhouse. Greenhouse gas blankets have existed since the creation of the planet. However, due to increased human activity, these greenhouse gases are increasingly being released into the atmosphere. This leads to thickening of the ceiling and confuses the

"natural greenhouse effect". Burning fuels such as coal, oil, and natural gas emits carbon dioxide. And when we destroy forests, the carbon stored in the trees escapes into the atmosphere as carbon dioxide. Increased agricultural activity, changing land use patterns, and other sources have led to increased concentrations of methane and nitrous oxide. Industrial processes also release man-made and new greenhouse gases such as CFCs (chlorofluorocarbons), but automobile exhaust gas leads to the production of ozone. The resulting increase in greenhouse effect is more commonly referred to as global warming or climate change.

### **How will climate change affect us?**

Climate change is a threat to humankind. The average surface temperature of the earth has risen by 0.3-0.6 ° C since the end of the 19th century. Such a rise in temperature may seem minimal to us, but as highlighted below, it can lead to catastrophe.

#### Agriculture

Food demand is increasing due to population growth. This puts pressure on natural resources. Climate change affects agricultural yields directly through changes in temperature and precipitation, and indirectly through changes in soil quality, pests and diseases. India's grain yield is said to decline. Extreme weather such as high temperature, heavy rain, flood and drought. It also affects crop production.

#### Weather

Warm climates change precipitation patterns, increase droughts and floods, melt glaciers and polar ice sheets, and bring about more sea level rise. The recent increase in cyclones and hurricanes is due to changes in temperature.

#### Sea level rise

One of the consequences of climate change is sea level rise. The heating of oceans, warm waters, melting glaciers and polar ice sheets are projected to raise average sea level by about 0.5 meters in the next century. Rising sea levels can have a variety of physical impacts on coastal areas, including land loss due to floods and erosion, increased floods, and saltwater intrusion. These can affect coastal agriculture, drinking water resources, fisheries, human settlements and health.

#### Health

Global warming will directly affect human health by increasing cases of heat-related mortality, dehydration, spread of infectious diseases, malnutrition, and damage to public health infrastructure.

#### Forests and wildlife

Plants and animals in the natural environment are very sensitive to changes in climate. If the rate of climate change continues to increase, extinction of various species of plants and animals could happen.

Increasing global warming problems In a 2018 UN report, thousands of scientists and government auditors limit global temperature rise to below 1.5 ° C to avoid the worst climate effects and maintain a livable climate. I agreed to help. However, based on the current National Climate Program, global warming will reach 2.7 ° C by the end of this century. Climate change-causing emissions come from all parts of the world and affect everyone, but some countries produce much more than others. The 100 countries with the lowest emissions generate 3 percent of total

emissions. The 10 countries with the highest emissions account for 68%. Everyone needs to take action on climate change, but the people and countries that are causing the problem have a great responsibility to act first.

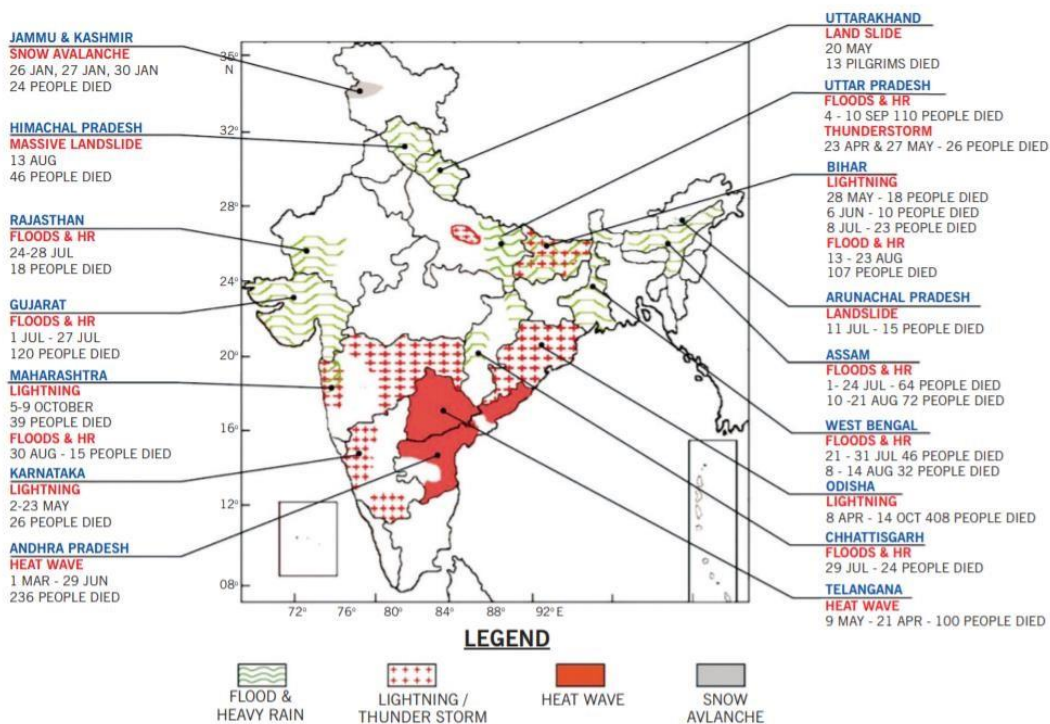
### India's vulnerability to Climate change

Because of its enormously diverse socio-economic profile; a topography that includes some of the world's highest glaciated peaks and a long coastline; and a climate ranging from cold to hot tropical, India is especially vulnerable to climate change. The unique geo-climatic circumstances also make the country vulnerable of floods, droughts, cyclones, urban flooding, landslides, avalanches and forest fire. Out of India's 36 States and Union Territories in the country, 27 are disaster prone. Around 12 per cent land is prone to flood and river erosion, of the around 7,500 km coastline, 5,700 km is prone to cyclones; 68 per cent of the cultivable land is vulnerable to drought; hilly areas are at risk from landslides and avalanches;

and 15 per cent of the landmass is prone to landslides. Climate change risks in India are further compounded by changing demographics and socioeconomic conditions, unplanned urbanization, development within high-risk zones, environmental degradation, natural disasters, geological hazards, epidemics and pandemics.

India has a long coastline of around 7,500 km and the coastal region comprises 78 districts in the nine maritime states. There are around 1,238 large and small islands in India which are vulnerable to the impact of climate change. The coastal populations and their livelihoods are vulnerable to sea level rise. The rate of sea level rise in India is comparable to the global mean sea level rise trend (3.2 mm yr<sup>-1</sup>). The sea level along the Indian coast increases from 0.33 to 5.16 mm per year and the pattern is projected to continue. As an emerging economy, India has a strong global focus on mitigation and adaptation. India needs to meet its growing demand for energy in the backdrop of increasing greenhouse gas emissions. Though 16 states have achieved 100 per cent household electrification, a sizable population in remaining states remains without access to electricity.

India is experiencing extreme weather events resulting in enhanced exposure to multihazard vulnerability with adverse impact on ecosystems, natural resources, agriculture and socio-economic profile. Almost two-thirds of Indian agriculture – The mainstay of the economy depends on monsoon. The unpredictability of monsoon rain has increased, more frequent, more violent and extreme events such as droughts and floods. Minimum temperatures are changing across India, far above changes attributed to natural climate variability. In line with the increasing trend witnessed in global surface temperatures, the average yearly temperature over India for the period 1901-2017 also showed a significantly rising trend of 0.66°C over 100 years. Extreme events like heat waves have risen in the last 30 years.



## Climate Change and its affects

Increasing frequency and intensity of disasters related to climate change impacts on weather systems, ecological dynamics and natural resources, reflect the need to adopt measures for disaster management and climate change adaptation. Climate change is known to increase people's vulnerability by intensifying underlying factors, besides aggravating frequency and intensity of hazards. The action plans to combat climate change and natural hazards should have dual objectives of Climate Change Adaptation (CCA) and Disaster Risk Reduction (DRR). For both CCA and DRR, the major shared objectives include protecting developmental goals through effective planning, managing risks and uncertainties. Early warning of extreme weather events is one of the critical components of DRR. For this purpose, the country has developed modern meteorological observation systems (Satellites, Doppler Weather Radars, GPS Radiosonde, AWS/ARG, Wind Profiler Radar). The Earth System Science Organization-India Meteorological Department (ESSO-IMD) and the Indian National Centre for Ocean Information Services (ESSO-INCOIS) are responsible for monitoring, detecting and forecasting severe weather events and for issuing flood warnings to India's rivers.

### Reference:

Lokesh Chandra Dube, M. Balasubramanian