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Climate Change – The Alarming Global Threat

JYOTISMITA DEKA

Guest Faculty, Department of English,
Mangaldai College, Mangaldai, Assam – 784125

Abstract

Climate change has emerged as one of the alarming threats of the present time. Its far-reaching consequences have already impacted the environment, societies, and the economies globally. The change in climatic patterns have also affected the topography of several places. Natural disasters have already proved to be more disastrous due to this change. The unnatural rise of global temperature has raised concern among the *Homo sapiens*. Climate change has been a significant matter of discussion at the international level since the late 1980s with the formation of the Intergovernmental Panel on Climate Change by the United Nations General Assembly (1988). This paper highlights the broader implication of climate change and the factors leading to this change along with elucidating the mitigation strategies, and emphasizing the crucial role of global cooperation in adapting to the detrimental effects of climate change.

Keywords : Climate change, threat, consequences, global temperature, implication, factors, mitigation, strategies, global cooperation

Introduction

Climate, by definition, refers to the statistics of weather over an arbitrarily defined time span. Climate, therefore, is the average weather conditions for a particular location over a long time period, ranging from months to thousands or millions of years. The World Meteorological Organization (WMO) uses a period of thirty years to determine the average climate. The global mean near-surface temperature in 2024 was 1.55 ± 0.13 °C above the 1850-1900 average. 2024 has been the warmest year in the 175-year observational record, beating the previous record set only the year before. The ocean absorbs approximately 90% of energy in the climate system, warming it to record levels in 2023. In 2024, global mean sea level reached a record high – 113 mm (4.4 in) in the satellite record (from 1993 to present).

(Source : <https://wmo.int>)

Climate change refers to the long-term shifts in temperatures and weather patterns, primarily caused by burning fossil fuels, deforestation, and industrial processes. These activities release greenhouse gases such as carbon dioxide, methane into the atmosphere, trapping the heat which ultimately leads to global warming. It disrupts natural ecosystems, affects biodiversity, leads to extreme weather events, rise in sea levels, melting of glaciers, shifting agricultural patterns, and overall, creates an imbalance in the ecosystem, thereby affecting every aspect of life on Earth.

Climate change and global temperature

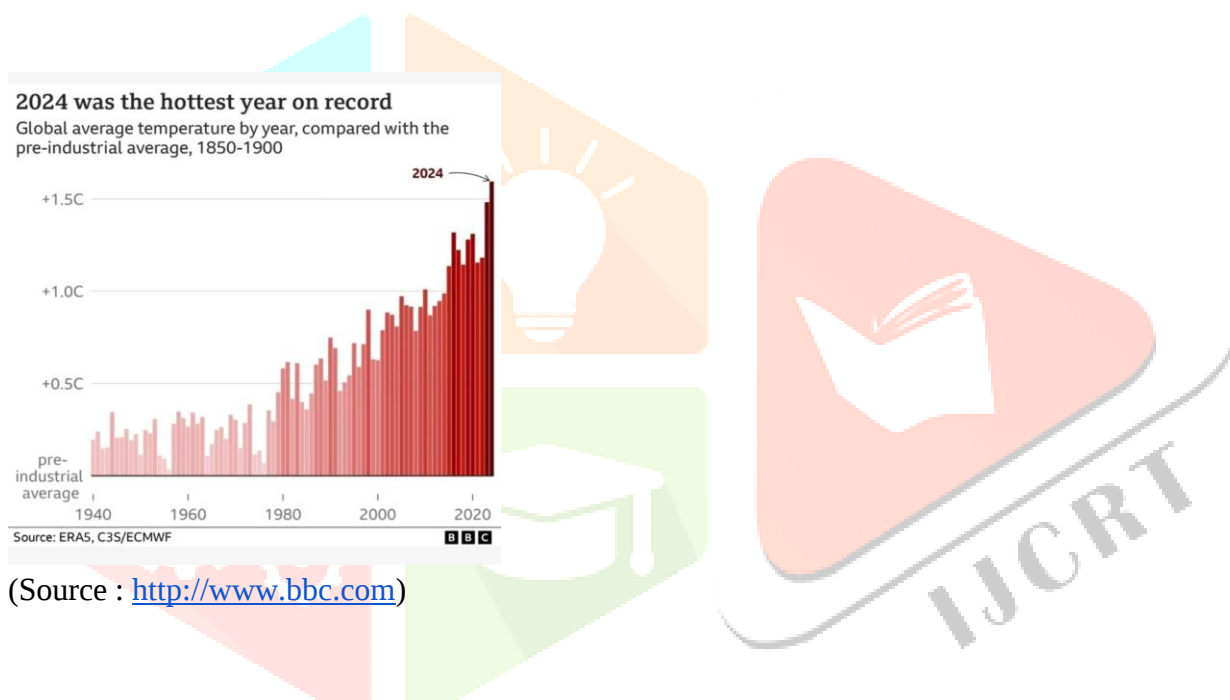
Earth's temperature has risen by an average of 0.11°F (0.06°C) per decade since 1850, or about 2°F in total. The rate of warming since 1982 is more than three times as fast : 0.36°F (0.20°C) per decade. 2023 was the warmest year since global records began in 1850 by a wide margin. It was 2.12 °F (1.18°C) above the 20th-century average of 57.0°F (13.9°C).

It was 2.43°F (1.35°C) above the pre-industrial average (1850-1900). The 10 warmest years in the historical record have all occurred in the past decade (2014-2023).

(Source : <https://www.climate.gov>)

The average temperature of the Earth's surface is now about 1.2 degree Celsius warmer than it was in the late 1800s (before the Industrial Revolution) and warmer than at any time in the last 100,000 years. (Source : <https://www.un.org>)

As stated in the reports of BBC News, between 2015 and 2024, global temperatures were on average around 1.28 degree Celsius above those of the late nineteenth century, according to the European Copernicus climate service. The year 2024 was the world's hottest on record, with climate change mainly responsible for the high temperatures. It was also the first calendar year to surpass 1.5 degree Celsius of warming compared to the pre-industrial levels, according to Copernicus.

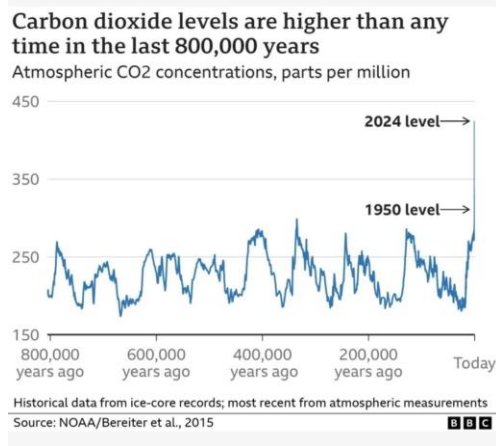


(Source : <http://www.bbc.com>)

Contribution of *Homo sapiens* in causing climate change

Industrialisation, Urbanisation, Globalisation — the 3 main factors that have shaped the present-day society and economy. The interplay between these 3 factors have resulted in depletion of resources at unprecedented rates, escalated emission of greenhouse gases on a global level, along with increased vulnerability to extreme weather events thereby making the ecosystem destabilised. On the brighter side, globalisation has connected the world culturally, economically, and technologically. It has also raised awareness of climate change, fostering global collaboration to combat its effects.

Burning of fossil fuels releases greenhouse gases, mostly carbon dioxide, that acts like a blanket and traps extra energy in the atmosphere, thereby causing the Earth to heat up. Since the start of the Industrial Revolution, the amount of carbon dioxide in the atmosphere has risen up by about 50%, far above the levels seen in the Earth's recent history, due to burning large amounts of fossil fuels, as reported by BBC.



(Source : <http://www.bbc.com>)

Clearing the green forest cover for agriculture, human habitation, urban development, logging have resulted in lesser absorption of carbon dioxide, leading to its higher concentrations in the Earth's atmosphere. Industries having manufacturing plants emit greenhouse gases such as methane and nitrous oxide that directly heat up the planet. In the past few decades, there has been a rapid increase in urban development which has increased the energy consumption and destruction of natural habitat, hence, contributing to climate change. Agricultural practices and use of fertilisers produce methane and nitrous oxide which aids along with other factors in climate change.

Effects of climate change

Climate change has already exhibited several alarming effects on the environment that has turned this issue into a matter of serious concern globally. The more the Earth warms, the worse the impacts of climate change turns out.

There has been rapid melting of glaciers and ice sheets, causing the sea levels to rise and increasing the threat to the polar ecosystems. Due to this rise in sea level, the coastal areas face flooding and soil erosion. Unusual heating up of the planet has increased heatwaves and altered climatic patterns. The rate of extreme weather events such as heavy rainfall, droughts, wildfires, hurricanes, has also increased. Oceans absorb excess heat and carbon dioxide, endangering marine life and coral reefs.

The change of climate has disrupted ecosystems, forcing the species to migrate or face extinction. There has been a rapid decline in biodiversity. Entire ecosystems such as forests and wetlands might transform, thereby altering their ability to support life. Altering weather patterns reduce agricultural productivity, leading to food shortages, which ultimately leads to higher prices. Scarcity of water, land, and raw materials increase costs for industries reliant on these resources. Extreme weather events disrupt transportation and manufacturing, affecting global trade that creates an imbalance in global demand.

Initiatives taken to deal with climate change

(i) Paris Agreement (2015), a landmark global treaty under the United Nations Framework Convention on Climate Change (UNFCCC), has emphasised on nationally determined contributions (NDCs) where countries outline their climatic actions. In this agreement, the countries agreed to limit global warming to below 2 degree Celsius, preferably to 1.5 degree Celsius, compared to pre-industrial levels.

(ii) Kyoto Protocol (1997) has set binding targets for the developed countries to reduce greenhouse gas emissions.

(iii) Green Climate Fund (GCF) was established to provide financial support to developing countries for projects that aim to reduce emissions and build climate resilience.

(iv) Intergovernmental Panel on Climate Change (IPCC) provides scientific assessments of climate change, its impacts, and potential adaptation and mitigation strategies.

(v) Countries are investing heavily in solar, wind, and hydro projects, and nuclear energy to phase out fossil fuels.

- (vi) Initiatives have been proposed, launched, and started to protect the forest cover and promote reforestation. Brazil's Amazon Fund is an example that aims to combat deforestation.
- (vii) Countries have implemented comprehensive policies to reduce emissions, sustainable agriculture, and renewable energy projects.
- (viii) The governments have been focusing on the development of energy-efficient, sustainable urban areas, as well as use of green buildings, public transportation, car pooling, and waste management systems.
- (ix) Awareness campaigns have been launched to educate communities about climate change, energy conservation, and the 3 R's (Reduce, Reuse, Recycle).
- (x) Innovations like electric vehicles, carbon capture technologies, and biodegradable materials are re-shaping industries.
- (xi) Most countries have, or are considering, net zero targets.

Conclusion

In a series of UN reports, thousands of scientists and government reviewers agreed that limiting global temperature rise to no more than 1.5 degree Celsius would help us avoid the worst climate impacts and maintain a liveable climate. Yet policies currently in place point to up to 3.1 degree Celsius of warming by the end of the century. The emissions that cause climate change come from every part of the world and affect everyone, but some countries produce much more than others. The six biggest emitters (China, the USA, India, the European Union, the Russian Federation, and Brazil) together accounted for more than half of all global greenhouse gas emissions in 2023. By contrast, the 45 least developed countries accounted for only 3% of global greenhouse gas emissions. (Source : <https://www.un.org>)

Several solutions to this grave issue of climate change resulting in a number of other issues can provide economic benefits as well as improve our lives and protect the environment. Global frameworks and agreements such as the Sustainable Development Goals (SDG), the Paris Agreement, the UN Framework Convention on Climate Change, aids in progression towards the desired goal. Reduction in emissions driving climate change by switching energy sources from non-renewable natural resources like coal and fossil fuels to renewable natural resources like solar energy and wind energy can help prevent the catastrophic impacts of climate change. A growing number of countries are committing to 'net zero emissions' by the year 2050, and the strategy is to cut in half the emissions by the year 2030, in order to keep the level of global warming below 1.5 degree Celsius. This goal clearly indicates a huge declination in the usage of coal, oil, and natural gas. Addressing this grave issue requires global cooperation and increased awareness about the impact of individual actions.

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