

Climate change refers to long-term alterations in temperature, precipitation, and weather patterns on Earth. While climate variations have occurred naturally throughout history, the current phase of climate change is largely attributed to human activities, particularly since the Industrial Revolution. The increased use of fossil fuels such as coal, oil, and natural gas has led to a significant rise in greenhouse gas concentrations in the atmosphere.

Greenhouse gases, including carbon dioxide, methane, and nitrous oxide, trap heat within the Earth's atmosphere. This phenomenon, known as the greenhouse effect, is essential for maintaining habitable temperatures. However, excessive greenhouse gas emissions amplify this effect, leading to global warming. Carbon dioxide emissions primarily result from burning fossil fuels and deforestation, while methane emissions originate from agriculture, livestock, and waste management.

The impacts of climate change are widespread and multifaceted. Rising global temperatures have caused glaciers and polar ice caps to melt, contributing to sea-level rise. Coastal regions and island nations are particularly vulnerable to flooding and erosion. Changes in precipitation patterns have led to more frequent and intense droughts, floods, and storms, affecting agriculture and water availability.

Climate change also poses serious risks to ecosystems and biodiversity. Many species struggle to adapt to rapidly changing environmental conditions, leading to habitat loss and extinction. Coral reefs, for example, are highly sensitive to temperature changes and are experiencing widespread bleaching due to warming oceans.

Human societies are deeply affected by climate change. Food security is threatened by unpredictable weather patterns and declining crop yields. Health risks increase due to heatwaves, air pollution, and the spread of vector-borne diseases. Economies suffer from damage to infrastructure and increased disaster recovery costs.

Mitigation and adaptation are two key strategies to address climate change. Mitigation focuses on reducing greenhouse gas emissions through renewable energy adoption, energy efficiency, and reforestation. Adaptation involves adjusting social, economic, and environmental systems to minimize harm. International agreements such as the Paris Agreement aim to coordinate global efforts to combat climate change.