

Causes of Climate Change and Recent Global Warming in Pakistan

Understanding Climate Change

Climate change refers to long-term changes in the Earth's climate caused mainly by human activities. Activities like burning fossil fuels, deforestation, and industrial emissions increase greenhouse gases in the atmosphere. These gases trap heat, leading to global warming, which is a steady rise in the Earth's average temperature. Although natural climate cycles exist, human activities have become the dominant factor in recent times. Pakistan is highly vulnerable to climate change because of its geographical location, dependence on agriculture, and low adaptive capacity. Understanding the causes of climate change is crucial to planning solutions that can protect people, the economy, and the environment.

Burning of Fossil Fuels

Fossil fuels such as coal, oil, and natural gas are the main sources of energy worldwide, but burning them releases large amounts of carbon dioxide and other greenhouse gases. In Pakistan, increasing fuel consumption for transportation, electricity generation, and industrial activities contributes significantly to global warming. Power plants and industries are major emitters, and urbanization increases energy demand even more. Because fossil fuels remain the primary energy source, they continue to drive climate change unless cleaner alternatives are adopted.

Deforestation and Land Use Changes

Forests play a vital role in regulating the climate because trees absorb carbon dioxide from the atmosphere. When forests are cut down for farming, construction, or urban expansion, this natural carbon storage is lost, increasing greenhouse gases. In Pakistan, deforestation in northern areas and other regions is shrinking green cover, which also worsens soil erosion and floods. Reforestation and careful land management can help reduce these harmful effects and restore balance to the environment.

Agriculture and Livestock Emissions

Agriculture contributes to climate change in many ways. Livestock like cows and buffaloes produce methane, a very strong greenhouse gas. Rice farming also releases methane, and fertilizers emit nitrous oxide. While agriculture is essential for Pakistan's economy and food security, these practices add to global warming. Using climate-smart farming techniques, better irrigation, and alternative fertilizers can reduce emissions while protecting the environment and ensuring sustainable food production.

Industrialization and Urban Growth

Rapid industrialization and urbanization also drive climate change. Factories, cement, and steel industries emit large amounts of carbon dioxide. Cities produce more waste, and poor waste management leads to methane emissions from landfills. Traffic congestion increases air

pollution, and concrete urban surfaces contribute to heat accumulation. Sustainable city planning, better waste management, and cleaner industries can help reduce these impacts and make urban areas more climate-resilient.

Global Factors and Recent Warming Trends

The industrial revolution started the large-scale emission of greenhouse gases, which has continued over the last hundred years. This has caused global temperatures to rise sharply, leading to melting glaciers and extreme weather events. In Pakistan, glaciers are melting faster than before, which threatens water supplies. Even though Pakistan contributes relatively little to global emissions, it is still heavily affected. Climate change is a global problem, and long-term solutions require cooperation among countries to reduce emissions and adapt to changes.