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Climate Change and its Consequences for the Environment

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Introduction

Global warming and its effects on Earth's weather patterns are both part of contemporary climate change. There have been prior times of climate change, but the current changes are far faster and are not caused by natural factors. Instead, greenhouse gas emissions, primarily carbon dioxide (CO2) and methane, are to blame. The majority of these emissions are caused by the burning of fossil fuels for energy. Additional sources include agriculture, steelmaking, cement production, and forest loss. Because greenhouse gases are transparent to sunlight, they allow it to reach the Earth's surface and heat it. The gases absorb the heat that the Earth produces as infrared radiation, keeping it near the Earth's surface. As the earth warms, things such as the decrease of sunlight-reflecting snow cover exacerbate global warming.

Temperatures on land have risen at a rate almost twice that of the world average. Heat waves and wildfires are getting more prevalent, and deserts are growing. Warming in the Arctic has resulted in permafrost melting, glacier retreat, and sea ice loss. Intense storms and other weather extremes are becoming more often as temperatures rise. Many species are being forced to relocate or become extinct due to rapid environmental change in mountains, coral reefs, and the Arctic. Food and water scarcity, higher flooding, extreme heat, more disease, and economic loss are among threats posed by climate change. As a result, human migration and conflict may occur. Climate change, according to the World Health Organization, is the greatest threat to world health in the twenty-first century. Even if attempts to reduce future warming are successful, some consequences will last generations. Sea level rise and warmer, more acidic waters are two examples. Many of these effects are already being felt at the present temperature of 1.2 degrees Celsius.

Description

Increased warming will amplify these effects and could lead to tipping points, such as the melting of the Greenland ice sheet. Nations pledged to limit global warming "far below 2 degrees Celsius" under the 2015 Paris Agreement. Despite the Agreement's pledges, global warming would still be around 2.7 degrees Celsius by the end of the century. To keep global warming to 1.5 degrees Celsius, emissions must be cut in half by 2030 and zero by 2050. The climate system goes through its own cycles, which might last years, decades, or even centuries. Other changes are triggered by an energy imbalance that is "external" to the climate system, although not always to the Earth. Changes in greenhouse gas concentrations, solar luminosity, volcanic eruptions, and variations in the Earth's orbit around the Sun are all examples of external forcing. Internal climate variability and natural external forcing must be ruled out before the human contribution to climate change can be determined. One important strategy is to identify unique "fingerprints" for all putative causes, then compare these fingerprints to observable climate change trends.

Solar forcing, for example, can be ruled out as a key factor. Its imprint would cause the entire environment to warm. Sunlight is absorbed by the Earth, which then radiates it as heat. Infrared radiation is absorbed and reemitted by greenhouse gases in the atmosphere, decreasing the rate at which it may move through the atmosphere and escape into space. Natural-occurring levels of greenhouse gases led the air near the surface to be around 33°C warmer than it would have been in their absence before the Industrial Revolution. While water vapour (50%) and clouds (25%) are the most significant contributions to the greenhouse effect, they also grow as a function of temperature, making them feedbacks. Concentrations of gases such as CO2 (20%), tropospheric ozone, CFCs, and nitrous oxide, on the other hand, are not temperature-dependent and hence act as external forcing. Air pollution in the form of aerosols not only has a significant impact on human health, but it also has a significant impact on the climate. From 1961 to 1990, there was a progressive reduction in the amount of sunlight reaching the Earth's surface, phenomena called as global dimming, which was ascribed to aerosols produced by biofuel and fossil fuel combustion. Aerosols have been falling globally since 1990, implying that they are no longer as effective at masking greenhouse gas warming. Solar energy is scattered and absorbed by aerosols. They also have an impact on the Earth's radiation budget in an indirect way. Cloud condensation nuclei such as sulphate aerosols lead to clouds with more and smaller cloud droplets. Solar radiation is reflected more effectively by these clouds than by clouds with fewer and larger droplets [1-5].

Future Prospective

Land use changes have an impact on more than just greenhouse gas emissions. The local temperature is influenced by the type of plants in a certain area. It has an impact on how much sunlight is reflected back into space, as well as how much heat is lost through evaporation. The transition from a dark forest to grassland, for example, makes the surface lighter, allowing it to reflect more sunlight. Deforestation can also affect temperatures by changing wind patterns and altering the release of chemical compounds that influence clouds. The total result is significant warming in tropics and temperate zones, while a gain in albedo (as forest is replaced by snow cover) causes cooling at latitudes closer to the poles. These effects are thought to have resulted in a minor cooling on a global scale, mainly by a rise in surface albedo.

Conflict of Interest

None.

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