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A REVIEW ON GLOBAL WARMING AND ITS IMPACTS

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ABSTRACT

Many academics, engineers, and environmentalists are concerned about changes in the planet's general climate. Electricity is produced from fossil fuels on a continual basis. The combustion of these fuels releases greenhouse gases such as carbon dioxide, methane, and nitrous oxides, which contribute to global warming. Warmer temperatures are also a result of deforestation. The threat of global warming continues to wreak havoc on the Earth's ecosystem. Most people are still ignorant of global warming and do not believe it will be a major issue in the future. The majority of people are unaware that global warming is already occurring, and that we are already suffering some of its debilitating consequences. It has and will continue to have a negative impact on ecosystems and disrupt ecological equilibrium. Some remedies must be developed due to the perilous consequences of global warming. The article introduces global warming, discusses its origins and dangers, and offers various options for dealing with this pressing problem. Alternative energy sources (solar, wind, hydro, geothermal, and biomass) must be explored aggressively. Finding and using renewable energy sources is one of the most effective ways to fight the ever-increasing effects of global warming.

KEYWORDS: *Climate Change, Deforestation, Fossil Fuels, Global Warming.*

INTRODUCTION

The world's temperature continues to increase, which is very distressing. Global warming is the underlying cause of this. When sunlight reaches the earth, global warming starts. About 30% of sunlight is reflected back into space by clouds, atmospheric particles, reflecting ground surfaces, and the surface of seas, while the rest is absorbed by oceans, air, and land. As a result, the surface of the planet and its atmosphere heat up, making life possible. As the Earth heats, solar energy is emitted via thermal radiation and infrared rays, which go straight into space and chill the planet. Some of the emitted radiation, however, is re-absorbed by carbon dioxide, water vapours, ozone, methane, and other gases in the atmosphere and radiated back to the Earth's surface. Because of their ability to trap heat, these gases are often referred to as greenhouse gases. It should be emphasized that this re-absorption process is beneficial since without greenhouse gases [1], [2].

The Earth's average surface temperature would be very cold. The problem started when humanity began to intentionally raise the quantity of greenhouse gases in the atmosphere at

an alarming pace during the last two centuries. Thermal radiation is further hampered by increasing quantities of greenhouse gases, resulting in a phenomena known as human accelerated global warming impact, which was pumped over 8 billion tons of carbon dioxide as of 2004. Recent measurements on global warming have backed up the hypothesis that the world is heating up due to a human-enhanced greenhouse effect. Over the past 100 years, the planet's surface temperature has increased the most. Between 1906 and 2006, the average surface temperature of the Earth increased by 0.6 to 0.9 degrees Celsius each year. Landfills and agricultural decomposition of biomass and animal dung produce millions of pounds of methane gas. Various nitrogen-based fertilizers, such as urea and diammonium phosphate, as well as other soil management practices, emit nitrous oxide into the atmosphere. These greenhouse gases remain in the atmosphere for decades, if not longer, after they are emitted. Carbon dioxide and methane levels have risen by 35 percent and 148 percent, respectively, since the industrial revolution of 1750, according to the Intergovernmental Panel on Climate Change (IPCC)[3].

While some other planets in the Earth's solar system are either scorching hot or freezing cold, the Earth's surface enjoys comparatively moderate and consistent temperatures. Earth's atmosphere, which is a thin layer of gases that covers and protects the planet, allows for high temperatures. However, 97 percent of climate scientists and researchers believe that people have significantly altered the Earth's atmosphere during the last two centuries, resulting in global warming. To comprehend global warming, it is essential to first comprehend the greenhouse effect. The natural greenhouse effect usually retains part of the heat, keeping our world safe from freezing temperatures, while the human-enhanced greenhouse effect causes global warming.

This is owing to the increased quantity of greenhouse gases (carbon dioxide, methane, and nitrogen oxides) in the atmosphere caused by the combustion of fossil fuels. Because a greenhouse operates in a similar manner to a greenhouse, the greenhouse effect is frequently used to describe the exchange of incoming and outgoing radiation that warms up the Earth (Figure 1). Incoming UV light penetrates through the greenhouse's glass walls readily and is absorbed by the plants and hard surfaces within. Weaker infrared radiation, on the other hand, has a hard time passing through the glass walls and is held within, warming the greenhouse. This effect allows tropical plants to thrive in a greenhouse even throughout the winter[4].

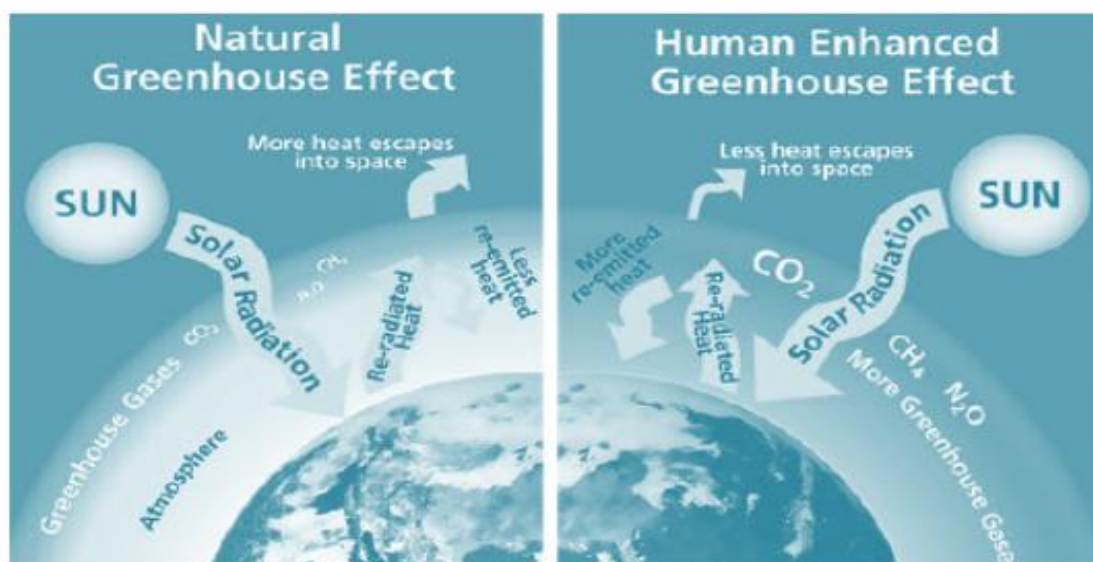


Figure 1: Illustrating the Natural and Human Enhanced Greenhouse Effect

DISCUSSION

Growth Rates of Greenhouse Gases In recent years, atmospheric levels of the major human-influenced GHGs have been measured, and data for older periods has been recovered from air

bubbles frozen in polar ice sheets. CO₂ and CH₄ are the gases that produce the most climatic forcing, as seen in Figure 2. In addition, Figure 2 depicts IPCC IS92 scenarios for the next 50 years. IS92a has been the most common scenario for climate model simulations, at least so far. These climate forcing predictions are based on a lot of assumptions and are very risky. The IS92a forcing for all well-mixed GHGs, including CFCs, was already 15% lower than the main IPCC scenario from 1990. In the 1990s, the observed rise in CH₄ was lower than the lowest IS92 scenario, while CO₂ was higher than the lowest IS92 scenario.

The yearly growth rates of climatic forcings, as illustrated in for human GHGs, talk more about their trends. Ed Dlugokencky and Tom Conway of the National Oceanic and Atmospheric Administration Climate Monitoring and Diagnostics Laboratory generously supplied the CO₂ and CH₄ levels for 1999. Carbon Dioxide. The growth rate of forcing by CO₂ doubled between the 1950s and the 1970s but was flat from the late 1970s until the late 1990s, despite a 30% increase in fossil fuel use. This finding implies a recent increase in terrestrial and/or oceanic sinks for CO₂, which may be temporary. The largest annual increase of CO₂, 2.7 ppm, occurred in 1998. The annual increase was 2.1 ppm in 1999, although the growth rate had decreased to 1.3 ppm/year by the end of the year (Figure 2)[5].

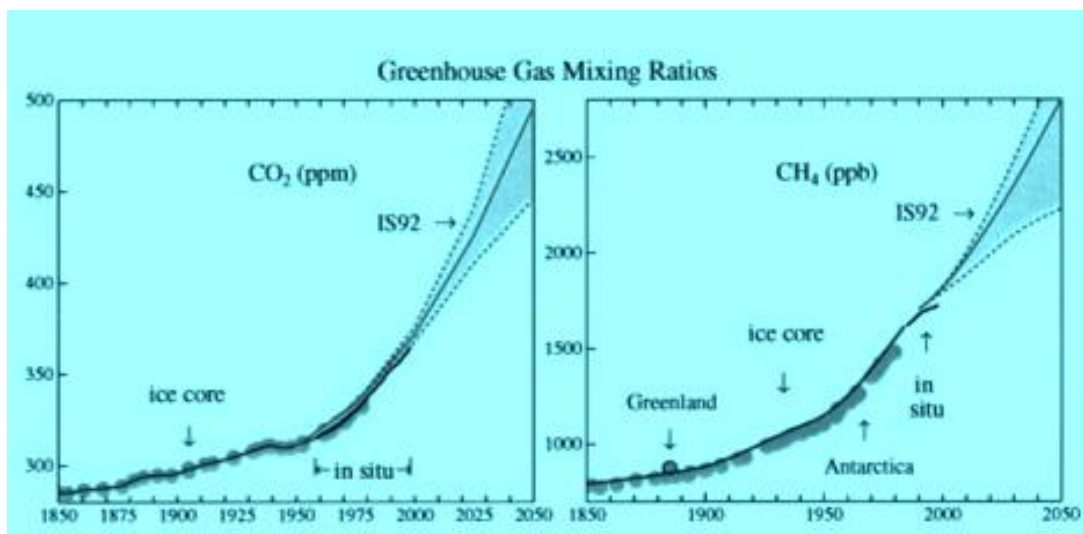


Figure 2: Atmospheric CO₂ and CH₄ Observations and Range of IS92 Scenarios

One of the most difficult challenges confronting climate scientists is predicting the effects of global warming. This is because natural processes such as rain, snowfall, hailstorms, and rising sea levels are influenced by a variety of variables. Furthermore, it is very difficult to forecast the amount of greenhouse gas emissions in the next years, since this is mostly influenced by technology advances and political choices. There are many negative consequences of global warming, some of which are discussed below. To begin with, excess water vapour in the sky condenses and falls as rain, causing floods in different parts of the globe. The evaporation process from both land and sea increases as the weather warms.

Extreme weather is another effect of global warming. While experiencing some of the hottest summers on record, much of the United States has also been experiencing colder-than-normal winters. Changes in climate can cause the polar jet stream — the boundary between the cold North Pole air and the warm equatorial air — to migrate south, bringing with it cold, Arctic air. This is why some states can have a sudden cold snap or colder-than-normal winter, even during the long-term trend of global warming.

"Climate is, by definition, the long-term average of weather, over many years. One cold (or warm) year or season has little to do with overall climate. It is when those cold (or warm) years become more and more regular that we start to recognize it as a change in climate rather than simply an anomalous year of weather," he said.

Global warming may also lead to extreme weather other than cold or heat extremes. For example, hurricane formations will change. Though this is still a subject of active scientific research, current computer models of the atmosphere indicate that hurricanes are more likely to become less frequent on a global basis, though the hurricanes that do form may be more intense.

"And even if they become less frequent globally, hurricanes could still become more frequent in some particular areas," said atmospheric scientist Adam Sobel, author of "Storm Surge: Hurricane Sandy, Our Changing Climate, and Extreme Weather of the Past and Future". "Additionally, scientists are confident that hurricanes will become more intense due to climate change." This is because hurricanes get their energy from the temperature difference between the warm tropical ocean and the cold upper atmosphere. Global warming increases that temperature difference.

Drought develops in areas when the enhanced evaporation process is not countered by greater precipitation. This will result in crop failure and hunger in certain parts of the globe, especially in regions where temperatures are already high. The increased water vapour concentration in the sky will fall as rain, resulting in flooding. Drought and water shortage may be experienced by towns and communities that rely on the melting water from snowy ranges. It's because glaciers all around the globe are rapidly decreasing, and ice melting seems to be occurring at a quicker pace than previously predicted.

According to the Intergovernmental Panel on Climate Change (IPCC), about one-sixth of the world's population lives in areas that will be impacted by a reduction of melting water. More heat waves, more intense rains, and an increase in the intensity of hailstorms and thunderstorms are all expected to result from a warmer environment. The most dangerous effect of global warming is raising sea levels; rising temperatures are forcing ice and glaciers to melt quickly. As a result, water levels in seas, rivers, and lakes would increase, potentially causing havoc in the form of flood. Temperature anomalies are expected to rise in the future years. The situation was well under control before the twentieth century, but it began to deteriorate around the turn of the twenty-first century.

This was owing to an increase in global warming, mostly as a result of new businesses and power plants coming online and emitting dangerous gases that cause the world to heat up. This information is based on studies conducted by several climate and environmental research organizations. Greenhouse gases are the primary cause of global warming. Carbon dioxide, methane, nitrous oxides, and, in rare instances, chlorine and bromine-containing chemicals are among them. The accumulation of these gases in the atmosphere alters the atmosphere's radiative balance. Because greenhouse gases absorb part of the Earth's outgoing radiation and re-radiate it back towards the surface, their overall impact is to warm the Earth's surface and lower atmosphere.

Between 1850 and the end of the twentieth century, the net warming was approximately 2.5 W/m², with carbon dioxide accounting for about 60% of the total, methane for 25%, and nitrous oxides and halocarbons accounting for the rest. Joe Farman of the British Antarctic Survey released a paper in 1985 demonstrating the decline in ozone levels over Antarctica during the early 1980s. The reaction was dramatic: large-scale worldwide research programs were launched to show that CFCs (aerosol propellants used in industrial cleaning fluids and refrigeration equipment) were to blame for the issue.

Even more crucial was swift international action to reduce CFC emissions. The loss of the ozone layer is the second main driver of global warming. This is caused mostly by the presence of chlorine-containing source gases. When exposed to UV light, these gases dissolve, releasing chlorine atoms, which catalyze the breakdown of ozone. Aerosols in the atmosphere are also contributing to global warming by altering the climate in two ways. They scatter and absorb solar and infrared light, and they also have the potential to change the

microphysical and chemical characteristics of clouds, as well as their lifespan and extent. Solar radiation scattering cools the globe, while solar radiation absorption by aerosols heats the air directly rather than allowing sunlight to be absorbed by the earth [4], [6], [7].

Global warming has the potential to have a negative impact on human health. creatures that are alive Excessive heat may create stress, which can lead to health problems resulting in high blood pressure and heart problems Failures of crops & famines, which are a direct result of rising temperatures. The build-up of earth may lead to a deterioration in human health. Virus and infection resistance is a term used to describe a person's ability to Warming of the planet may potentially spread illnesses to other parts of the world. People will migrate from hotter areas to cooler ones[8]. Severe flooding may occur in the seas and other surface waterways outbreaks of cholera and dangerous illnesses in certain kinds of shellfish[9], [10].

CONCLUSION

When it comes to the grim reality of global warming and the role of people in it, the scientific and environmental communities are on the same page. We've just scratched the surface of a complicated line of scientific and technological study in the essay we just read. Global warming is a serious danger, and appropriate measures must be taken to address this serious problem. Not only people, but also animals and plants, are affected by this issue. Floods will occur from the melting of the polar ice caps, wreaking devastation all across the globe. As sea levels rise, agricultural and fishing activities will be affected. Certain urgent actions, including but not limited to the usage of renewable energy sources and the stopping of deforestation, must be taken to solve these problems. To completely remove this danger, innovative solutions must be presented.

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