

A Review Study on Causes and Solutions of Global Warming

Parag Agarwal, Associate Professor,
Department of Physics, Teerthanker Mahaveer University, Moradabad, Uttar Pradesh, India
Email Id- paragagarwak.2008@gmail.com

ABSTRACT: *The greenhouse effect produced by increasing amounts of carbon dioxide, CFCs, and other pollutants causes global warming, which is a steady rise in the earth's temperature. Electricity is produced from fossil fuels on a continual basis. The combustion of these fuels almost doubles the amount of energy produced. Sea levels have risen, indicating an increase in greenhouse gases such as carbon dioxide, methane, and nitrous oxides, all of which contribute to global warming. Deforestation also contributed to the 20th century by 0.17 meters. The amount to which temperatures have risen. The threat of global warming continues to wreak havoc on the Earth's ecosystem. Sea ice in the Arctic has been gradually shrinking at a rate of 2.7 percent each decade. Most people are still ignorant of global warming and do not believe it will be a major issue in the future. People are unaware that global warming is already occurring, and that we are already suffering some of its negative 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. The pursuit of biomass must be taken seriously. Identifying and using renewal Above all, alternative energy sources such as solar, wind, and hydro, as well as one of the ways geothermal, may successfully fight the ever-increasing global warming.*

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

1. 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 ocean surfaces, while the rest is absorbed by seas, air, and land. As a result, the planet's surface and 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, 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[1]–[5].

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 as a result of a human-enhanced greenhouse effect. Over the past 100 years, the planet's surface temperature has increased the most. The Earth's average surface temperature increased between 1906 and 2006 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)[6], [7].

1.1. The Greenhouse Effect:

While 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 in the last two centuries, resulting in global warming. To comprehend global warming, it is essential to first comprehend the greenhouse effect. As seen in Fig. 1, 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[8].

On a chilly bright day, a vehicle parked outdoors experiences a similar effect. The inside of the vehicle is warmed by incoming solar radiation, while exiting thermal radiation is contained within the closed windows. The vehicle is essentially warmed up by this trapping. The hot air is trapped in such a manner that it does not ascend and does not lose energy as a result of convection. This occurrence has been portrayed [9]–[11].

1.2. The Dangers of Greenhouse Gases:

Many greenhouse gases are generated primarily as a result of human activities. Carbon dioxide is first and foremost on the list. Excessive combustion of fossil fuels such as coal and oil is the primary source of this gas. Furthermore, deforestation, or the removal of trees for the purpose of obtaining land, releases a significant quantity of carbon dioxide into the atmosphere. When calcium carbonate is heated, lime and carbon dioxide are produced, which adds to carbon dioxide emissions in the environment. Methane, often known as natural gas, is the second culprit gas. It's produced as a consequence of agricultural operations including animal digestion, paddy rice cultivation, and manure usage. Methane is also generated as a result of poor waste management. Fertilizers are the primary source of nitrous oxides. Furthermore, fluorinated gases like chlorofluorocarbons (CFCs) are mostly produced by industrial operations and refrigeration.

1.3. Global Warming Causes

Greenhouse gases are the primary cause of global warming. Carbon dioxide, methane, nitrous oxides, and 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. From 1850 until 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 for the rest. Joe Farman of the British Antarctic Survey released a paper in 1985 demonstrating the decline in ozone levels over Antarctica in the early 1980s. CFCs (used as aerosol propellants in industrial cleaning fluids and refrigeration equipment) were blamed for the issue, and large-scale worldwide research programs were launched to prove it.

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 mostly owing to the presence of source gases containing chlorine. When exposed to UV light, these gases dissolve, releasing chlorine atoms, which catalyze the breakdown of ozone. Aerosols in the atmosphere also contribute to global warming by altering the temperature 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's surface.

Human activity has a variety of effects on the quantity of aerosols in the atmosphere. Dust, for example, is a by-product of agriculture. When you burn biomass, you get a combination of organic droplets and soot particles. Depending on what is burnt or produced in the production process, many industrial operations produce a broad range of aerosols. Furthermore, exhaust emissions from different modes of transportation create a complex combination of contaminants that are either aerosols or are converted into aerosols by chemical processes in the atmosphere.

1.4. The Consequences of Global Warming:

One of the most challenging challenges facing 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. Drought develops in areas when the enhanced evaporation process is not offset by higher precipitation. Crop failure and hunger will occur in certain parts of the globe, especially in regions where temperatures are already high.

The excess 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), approximately one-sixth of the world's population lives in areas where melting water levels are expected to drop. 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 consequence of global warming is rising sea levels, since rising temperatures cause 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 floods.

Temperature anomalies are expected to rise in the future years, as seen in Fig. 5. 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 due to an increase in global warming, which was mostly caused by the start-up of new businesses and power plants, which produced hazardous gases that caused the globe to heat up. This information is based on studies conducted by several climate and environmental research organizations.

1.5. Consequences for Living Things:

The health of living creatures may be seriously harmed as a result of global warming. Heat may induce stress, which can contribute to high blood pressure and cardiac problems. Crop failures and famines, which are a direct result of global warming, may reduce the human body's resilience to viruses and diseases. As people migrate from higher-temperature areas to lower-temperature areas as a result of global warming, certain illnesses may spread to other areas. Warmer seas and other surface waters may result in major cholera outbreaks and dangerous illnesses in some kinds of seafood. Furthermore, it is well known that hotter temperatures induce dehydration, which is a leading cause of kidney stones. A medical group from the

The Children's Hospital of Philadelphia looked at the health records of over 60,000 Americans as well as meteorological data. They found that three days following a fever increase, people were more likely to be admitted to the hospital with kidney stones. Kidney stone incidence has increased from approximately one in 20 individuals in 1994 to one in 11 people nowadays. As the world becomes hotter, this tendency is expected to continue.

Infections of valley fever have been on the increase, owing to warmer temperatures and dust storms caused by drought. The virus may be transmitted by spores carried by the wind and dry soil. The quantity of dusting carrying this illness is expected to rise as temperatures get hotter and drier. Warmer and longer summers have already resulted in an increase in mosquito-borne diseases such as dengue fever and malaria, according to researchers.

Animals are suffering as a result of global warming. In order to live, they must relocate to colder areas. This phenomenon has been seen in a variety of locations, including the Alps, Australia's hilly Queensland, and Costa Rica's foggy woods. Fish in the North Sea have also been seen migrating northwards. The effects on species are becoming so noticeable that their migrations may now be used as an indicator of global warming. They are the silent witnesses to the rapid changes that are wreaking havoc on the planet. Global warming, according to scientists and experts, is progressively destroying the habitats of different species and is having a negative influence in their extinction. For example, Asia's sole primate, the orangutan, is in grave danger.

A variety of factors, including climate change, are threatening the animal's few surviving strongholds in Indonesian rainforests, placing it at risk of extinction within a few decades.

Bushfires are becoming increasingly common in these highly logged forests as global warming increases the length and frequency of droughts, further fragmenting the orangutan's natural area. Similarly, elephants in Africa suffer a number of challenges, including dwindling living area, which forces them to interact with humans more often. Elephants will be unable to avoid any changes to their native environment induced by global warming, such as more frequent and longer dry spells, putting further strain on their survival.

1.6. Alternative Energy Sources:

The dangers that global warming poses are enormous. Excessive usage of fossil fuels like coal, natural gas, and oil contributes to the problem as well. The use of fossil fuels should be phased out as soon as possible. The adoption of alternative energy sources is the most important approach for ending this catastrophe. Wind, solar, biomass, geothermal, and hydropower are among them. The fact that these sources are clean is the most important factor to consider while utilizing them. They do not emit any pollutants or harmful gases that contribute to global warming. They are eco-friendly and do not jeopardize the natural equilibrium. However, their expensive installation and setup costs may initially deter energy firms from investing in them, but in the long term, they will undoubtedly benefit everyone. Most significantly, fossil fuels will be depleted at some point, and we will need to switch to renewable energy sources for energy production sooner or later. As a result, using alternative energy sources will be the long-term answer to halting global warming.

It is critical to switch to renewable energy sources to combat the medical risks of global warming. The entire public should be accountable for their energy conservation choices. For future generations, this will guarantee a healthy environment and a stable climate. Governments should create and implement laws that encourage energy businesses and the general public to utilize renewable energy instead of conventional energy. People should be given brochures by nongovernmental organizations (NGOs) encouraging them to adopt alternative energy sources and discouraging them from using fossil fuels. They should also convey the risks associated with the use of fossil fuels. Many industrialized nations are already utilizing renewables to generate massive quantities of energy. To fight the evil of global warming, these nations should provide a helping hand to poorer countries. The most efficient method to reduce the emission of gases that contribute to global warming is to use renewable energy.

1.7. Other Solutions:

As previously said, toxic emissions are a significant contributor to global warming. One possible way to decrease hazardous emissions is to limit the use of cars that emit them. This has mostly failed since many individuals refuse to reduce their reliance on automobiles. Certainly, some individuals have begun to utilize bicycles and public transportation, while others choose to walk, but these figures are still in the minority. It should be mentioned that fuel economy and pollution levels are the most important aspects to consider when choosing a vehicle. Hybrid vehicles are more fuel efficient and emit less pollutants. Maintaining proper tire inflation can increase mileage, and air filters should be changed on a regular basis to reduce hazardous emissions. To decrease the overall number of cars on the road, people should carpool with friends or coworkers. Print and social media have the potential to help solve the issue. It should use the advertising concept of automobiles to persuade drivers to save energy and minimize emissions.

Instead of throwaway batteries, people should utilize rechargeable batteries. Quality, long-lasting goods should be purchased. Shopping should be done in local markets to save time and money on transportation. Even modest individual actions, such as lowering temperatures in the winter and replacing incandescent lights with compact fluorescent lamps, may help to combat global warming. To grow a significant number of trees, reforestation programs must be initiated. Deforestation and forest degradation must be avoided at the national level. Nuclear power is another option since it produces less pollutants, but it should be used with caution because it may cause serious accidents. If this technique is to be made practical, the main barrier is to overcome the security, propagation, waste management, and high costs of nuclear power.

2. DISCUSSION

Because a greenhouse operates in a similar manner, the greenhouse effect is frequently used to describe the exchange of incoming and departing radiation that warms up the Earth. Incoming UV light travels readily through a greenhouse's glass walls 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. The greenhouse effect, in combination with rising greenhouse gas levels and consequent global warming, is anticipated to have philosophical ramifications. If global warming is allowed to continue unabated, it will result in major climate change, a rise in sea levels, catastrophic weather events, and other devastating natural, environmental, and social consequences.

3. CONCLUSION

The scientific and environmental communities are on the same page when it comes to the harsh truth of global warming and the human factor's role in it. The article we've just examined has merely scratched the surface of a complex line of scientific and technical research. Global warming is a significant threat, and proper steps must be done to address it. This issue is creating problems not just for humans, but also for animals and plants. The melting of the polar ice caps will result in floods, which will wreak havoc all across the world. Agricultural and fishing operations will be harmed as sea levels rise. To address these issues, certain immediate measures must be done, including, but not limited to, the use of renewable energy sources and the halting of deforestation. To eliminate this threat once and for all, creative solutions must be proposed.

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