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## Global warming: A challenge

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### Abstract

The concerning escalation in the Earth's temperature is a matter of significant alarm. This surge is primarily attributed to the phenomenon of global warming. This chapter delves into the intricate challenges brought about by increasing temperatures, highlighting their impact on the environment, society, and the economy. It thoroughly examines the causes of global warming, elucidating the contributions of both human activities and natural factors. Additionally, this chapter explores potential remedies, underscoring the pressing need for collective efforts to alleviate and adjust to the repercussions of climate change. Through a thorough examination, the objective is to enhance awareness and encourage thoughtful involvement in the global initiative to address this pivotal issue. The study also underscores the urgency of embracing sustainable practices and fostering international collaboration to counteract the effects of global warming and ensure the well-being of the planet's future.

**Keywords:** Climate, environment, global warming, temperature

### 1. Introduction

#### 1.1 The Rising Tide of Global Warming

According to NASA, "Global warming is the unusually rapid increase in Earth's average surface temperature over the past century primarily due to the greenhouse gases released by people burning fossil fuels <sup>[1]</sup>."

Global warming is an increase in the average temperature of the earth, especially a sustained change sufficient to cause climate change. This increase in earth's average temperature is called Global warming. One of the most pressing challenges we face is the escalating threat of global warming and climate change that is significantly changing the life and functioning of humans, animals, and plants. This chapter explores the factors contributing to this crisis and urgent need for collective action. In today's world, our planet grapples with the consequences of human activities. Many of these activities result in global warming. All specialists studying the climate record of the earth have the same opinion now that human actions, mainly the discharge of greenhouse gases from smokestacks, vehicles, and burning forests, are perhaps the leading factors causing global warming.

#### 2. History of Past Actions

Due to global warming, the temperature on Earth is rising and it is affecting life not only on land but in the sea also. National Resources Defense Council states, "Though natural cycles and fluctuations have caused the earth's climate to change several times over the last 800,000 years, our current era of global warming is directly attributable to human activity—specifically to our burning of fossil fuels such as coal, oil, gasoline, and natural gas, which results in the greenhouse effect <sup>[3]</sup>."

During the 18th century of the Industrial Revolution, there was an increase in factories to help with manufacturing. Even though this improved the production of manufactured goods, the factories burn fossil fuels such as oil, coal, and gas, which release harmful gases like carbon dioxide etc. into the atmosphere. The average temperature of the globe has increased more than a degree since 1900 and the speed of warming has been almost three folds the century long average since 1970. In today's modern world also, humans rely on the burning of fossil fuels in their daily life such as to drive their vehicles, heat their homes, power industries and to generate electricity.

#### 3. Consequences of Global Warming

The consequences of global warming are far-reaching and severe. Melting ice caps and glaciers contribute to rising sea levels, posing a direct threat to coastal communities. Extreme weather events, from hurricanes to droughts are becoming more frequent and intense, disrupting ecosystems and human livelihoods.

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High temperature and humidity can result in heat waves. If the temperature remains the same or does not cool down at night, this can be dangerous to human health and can lead to death, thousands of people around the world die due to heat waves. An increase in carbon dioxide can cause plants to grow fast and produce potent allergens. Global warming can not only affect human health from diseases and illnesses, but it can also injure them from extreme weather events. Global warming increases hurricanes, rising sea levels, floods, droughts, fires, and rainstorms that put people's lives at risk. Global warming also affects the way crops grow. Based on the study on past climate shifts, notes of current situations, and computer simulations, many climate scientists say that the 21<sup>st</sup> century might see temperatures rise of about 3 to 8 degrees, climate pattern may shift adversely, ice sheets contract and sea rise several feet. With the probable exemption of one more world war, a huge asteroid, a fatal plague, or global warming may be the only worst dangers to our planet earth.

#### 4. The Greenhouse Effect Unveiled

At the heart of global warming lies the greenhouse effect, a natural phenomenon that sustains life on Earth however, human activities, primarily burning of fossil fuels and deforestation have significantly intensified this effect, The major cause of global warming is the release of greenhouse gases like carbon dioxide, methane, nitrous oxide etc. into the atmosphere. The major source of carbon dioxide is the power plants. These power plants emit large amounts of carbon dioxide produced from burning of fossil fuels for the purpose of electricity generation. About twenty percent of carbon dioxide emitted in the atmosphere comes from burning of gasoline in the engines of the vehicles. Buildings, both commercial and residential represent a larger source of global warming than cars and trucks. Building of these structures require a lot of fuel to be burnt which emits a large amount of carbon dioxide in the atmosphere. Methane is more than 20 times as effectual as CO<sub>2</sub> at entrapping heat in the atmosphere. Another cause of global warming is deforestation that is caused by cutting and burning of forests for the purpose of habitation and industrialisation. Scientists all over the world are making predictions about the ill effects of Global warming and connecting some of the events that have taken place in the past few decades as an alarm of global warming. The effect of global warming is increasing the average temperature of the earth.

#### 5. The Vulnerable Ecosystems

A rise in earth's temperatures can in turn cause to other alterations in the ecology, including an increasing sea level and modifying the quantity and pattern of rainfall. Ecosystems around the world are under immense stress as temperature soar. Coral reefs, crucial for marine biodiversity, face bleaching and degradation. Polar ecosystems are witnessing rapid changes, affecting iconic species like polar bears. The delicate balance of nature is teetering on the edge. These modifications may boost the occurrence and concentration of severe climate events, such as floods, famines, heat waves, tornados, and twisters.

#### 6. Impacts of Global Warming

Some of the very common impacts of Global Warming and Climate Change are wildfires, droughts, heavy snowfall, frequent hurricanes, heavy rainfall leading to floods, heat waves, retreating of glaciers, ocean acidification and lot

more as the list keeps on increasing with every passing day. It is also one of the major reasons for the extinction of some species due to an unexpected change of temperature in their habitats. It is expected that many species will die off or become extinct due to the increase in the temperatures of the water, whereas various other species, which prefer warmer waters, will increase tremendously. Perhaps the most disturbing changes are expected in the coral reefs that are expected to die off as an effect of global warming. Global warming is expected to cause irreversible changes in the ecosystem and the behavior of animals. Birds are a species that will be affected by a change in the climate. Global warming might result in birds finding a more permanent home in northern areas in the Northern Hemisphere. Scientists tell us that the tundra is in danger of melting due to an amount of extra global warming that is equivalent to the net amount that is previously in the earth's atmosphere. Global warming is not just an environmental crisis; it is a socio-economic challenge. Vulnerable communities, often least responsible for the emissions causing climate change, bear brunt of its impacts. Displacement, food insecurity, and resource conflicts are escalating creating a complex web of challenges that demand attention.

This is a disturbing sign and points that a huge destabilization that may now be in progress deep within the second biggest growth of ice on the planet. This ice would be enough to raise sea level 20 feet worldwide if it broke up and slipped into the sea. Each day passing brings yet new proof that we are now in front of a global emergency, a climate emergency that needs instant action to shrilly decrease carbon dioxide emissions worldwide to turn down the earth's rising temperatures and avoid any calamity. It is not easy to attach any event to global warming, but studies prove the fact that human activities are increasing the earth's temperature. Even though most predictions focus on the epoch up to 2100, even if no further greenhouse gases were discharged after this date, global warming and sea level would be likely to go on to rise for more than a millennium, since carbon dioxide has a long average atmospheric life span.

#### 7. Call for Global Cooperation

Addressing global warming requires a united front. International agreements and collaborations are essential to implement sustainable practices, reduce emissions, and transition to clean energy sources. The Paris agreement stands as a testament to the recognition that this is a challenge that transcends borders. Efforts are being made by various nations to cut down the rate of global warming. One such effort is the Kyoto agreement that has been made between various nations to reduce the emissions of various greenhouse gases. Also, many nonprofit organizations are working for the cause. Several international agreements and policies address global warming. The Paris agreement, adopted in 2015, is a key framework where countries committed to limiting global temperature rise. Additionally, the Kyoto protocol, though largely replaced by Paris agreement, was a landmark treaty focused on reducing greenhouse gas emissions. Various initiatives like the United Nations Framework Convention on Climate Change (UNFCCC) also play a role in coordinating global efforts to combat climate change.

#### 8. Global Warming and Climate Change

There is no doubt that global warming and climate change

are interrelated. According to National Geographic Magazine, “Global warming causes climate change, which poses a serious threat to life on Earth in the forms of widespread flooding and extreme weather. Scientists continue to study global warming and its impact on Earth [3].” Moreover, the cause of both is human activities and a decrease in the forest cover on the Earth. Humans, being superior to animals, have the duty to preserve the natural substances of the environment to make it easier for other species to survive on this planet. The world needs to step up its efforts to stop global warming and climate change at drastic levels or else more and more species will become extinct in days to come. We must also support the government in its initiatives towards ensuring a better climate for the future generations.

## 9. Conclusion

In conclusion global warming stands as a formidable challenge that demands collective and decisive action. The challenge of global warming is vast, but humanity has the capacity to change its course. The implications for our planet, our worst encompassing shifts in climate patterns, rising sea levels and threats to biodiversity. Addressing this challenge requires global cooperation, sustainable practices, and innovative solutions. The urgency is evident, and our commitment to mitigating climate change will determine the well-being of future generations in the health of the Earth we call our home. Global warming threatens the planet in a new and unexpected way – by triggering earthquakes, tsunamis, avalanches, and volcanic eruptions. Through informed choices, policy reforms, and a collective commitment to sustainable living, we can strive to mitigate the impacts of global warming and safeguard the future of our planet. The paper also sheds light on the significant role human activities play in intensifying global warming, particularly through the combustion of fossil fuels and deforestation. However, it is encouraging to note that we possess the necessary tools and technologies to alleviate these effects. The use of renewable energy, energy-efficient technologies, and sustainable practices can significantly reduce our carbon footprint. In essence, combating global warming is a shared responsibility that calls for the united efforts of governments, businesses, communities, and individuals across the globe. It is our sincere hope that this research will stimulate more enlightened discussions, inspire innovative solutions, and prompt decisive actions in the fight against global warming. The survival of our planet hinges on our actions today.

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