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# Impact of Global Warming

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**Abstract:** In present time climate change has been recognized as the foremost environmental problem of the twenty first century and has become a subject of considerable debates. It is predicted to lead to adverse, irreversible impact on earth and the ecosystem as a whole. Although it is difficult to connect specific weather events to global warming, increase in global temperatures has been predicted to cause border changes, including glacial retreat, arctic shrinkage, and worldwide sea level rise. Climate change has been implicated in mass mortalities of mail, aquatic species, including plants. Climate change is an emerging threat to global public health in many ways including heat stress, air pollution, food scarcity and spread of infectious diseases and intensity of disease outbreaks. Thus, 'Global Climate Change' has been a major issue that has created global concern and this has been highlighted by awarding the 2007 Nobel Peace Prize for this cause, on the Inter-Governmental Panel of Climatic Change (IPCC) and Albert Arnold (M) Gore JR., the former American Vice-President, jointly.

Global warming is being proven as the major reason behind the climate change. Fossil fuels are being continuously used to produce electricity. The burning of these fuels produces gases like carbon dioxide, methane and nitrous oxides which lead to global warming. Deforestation is also leading to warmer temperatures. The hazard of global warming is continuously causing major damage to the earth's environment.

The present paper focuses on different aspects of 'Global Climate Change'; the causes, predicted impacts. Probable steps for mitigation and the need for greater understanding of climate change and bringing global awareness on the issue.

**Key Words:** Global Warming; Greenhouse Gas.

## 1. Objectives

a. Understanding the concept of global warming
b. To study the causes of global warming
c. To study the effects of temperature rise
d. To know about the measures to reduce rise in temperature
e. To inform others also about global warming

## 2. Introduction

Since the Industrial Revolution, the global annual temperature has increased in total by a little more than 1 degree Celsius, or about 2 degrees Fahrenheit. Between 1880—the year that accurate record keeping began till 1980, it increased by an average of 0.07 degrees Celsius (0.13 degrees Fahrenheit) every 10 years. Since 1981, however, the rate of increase has more than doubled. For the last 40 years, we've seen the global annual temperature rise by 0.18 degrees Celsius or 0.32 degrees Fahrenheit, per decade.

A planet that has never been hotter than before. Nine of the 10 warmest years since 1880 have occurred since 2005 and

the 5 warmest years on record have all occurred since 2015. Climate change deniers have argued that there has been a "pause" or a "slowdown" in rising global temperatures but numerous studies, including a 2018 paper published in the journal Environmental Research Letters, have disproved this claim. The impact of global warming is already harming people around the world.

Now climate scientists have concluded that we must limit global warming to 1.5 degrees Celsius by 2040 if we are to avoid a future in which everyday life around the world is marked by its worst, most devastating effects: the extreme droughts, wildfires, floods, tropical storms, and other disasters that we refer to collectively as climate change. These effects are felt by all people in one way or another but are experienced most acutely by the underprivileged, the economically marginalized, and people of color for whom climate change is often a key driver of poverty, displacement, hunger, and social unrest.

## 3. Causes of Global Warming

Global warming occurs when Carbon Dioxide (CO2) and other air pollutants collect in the atmosphere and absorb sunlight and solar radiation that have bounced off the earth's surface. Normally this radiation would escape into space, but these pollutants, which can last for years to centuries in the atmosphere, trap the heat and cause the planet to get hotter. These heat-trapping pollutants— specifically Carbon Dioxide, Methane, Nitrous Oxide, water vapor, and synthetic fluorinated gases—are known as Greenhouse gases, and their impact is called the greenhouse effect.

Since the beginning of the Industrial Revolution, humans have been rapidly changing the amount of gases in the atmosphere. Burning of fossil fuels like coal and oil releases water vapor, Carbon Dioxide (CO2), Methane (CH4), Ozone and Nitrous Oxide (N2O); the primary Greenhouse gases.

**Carbon dioxide (CO2):**

Carbon dioxide is the most common Greenhouse gas. Between about 800,000 years ago and the beginning of the industrial revolution, its presence in the atmosphere amounted to about 280 parts per million (ppm). Today, it's about 400 ppm. (This number means there are 400 molecules of Carbon Dioxide in the air per every million air molecules.) We know through high-accuracy instrumental measurements that there is an unprecedented increase in CO2 in the atmosphere. We know that CO2 which absorbs infrared radiation [heat] causing rise in global mean temperature.

**Sources of Carbon Dioxide (CO2):**

**Due to burning fossil fuels**

CO2 makes its way into the atmosphere through a variety of routes. Burning fossil fuels releases CO2 and is by far the primary way that U.S. emissions warm the globe. According to the EPA's 2015 report, U.S. fossil fuel combustion, including electricity generation, releases just over 5.5 billion tons (5 billion metric tons) of CO2 into the atmosphere annually. Other processes such as non-energy use of fuels, iron and steel production, cement production and waste incineration boost the total annual CO2 release in the U.S. to almost 6 billion tons (5.5 billion metric tons).

**Due to deforestation**

Deforestation is also a large contributor to excessive CO2 in the atmosphere. In fact, deforestation is the second largest anthropogenic (human-made) source of carbon dioxide, according to research published by Duke University. When trees are killed, they release the carbon they have stored during photosynthesis. According to the 2010 Global Forest Resources Assessment, deforestation releases nearly a billion tons of carbon into the atmosphere per year.

**Methane (CH4):**

Methane is the second most common Greenhouse gas, but it is much more efficient at trapping heat. In 2012, the gas accounted for about 9% of all U.S. greenhouse gas emissions, according to the EPA. The EPA reports that methane has 20 times more impact than Carbon Dioxide on climate change over a 100-year period.

**Sources of Methane (CH4)**

Methane is generated by many natural sources, but humans cause a large portion of methane missions through mining, the use of natural gas, the mass raising of livestock and the use of landfills, according to the Inventory of U.S. Greenhouse Gas Emissions and Sinks report from 1990 to 2012. In fact, according to the EPA, humans are responsible for more than 60%of methane emissions.

**Nitrous Oxides (N2O):**

Nitrous oxide emissions get produced by both natural and human sources. Important natural sources include soils under natural vegetation and the oceans. Natural sources create 62% of total emissions. Since the Industrial Revolution, human sources of Nitrous Oxide emissions have been growing. Activities such as agriculture, fossil fuel combustion and industrial processes are the primary causes of the increased Nitrous Oxide concentrations in the atmosphere. Together these sources are responsible for 77% of all human Nitrous Oxide emissions. Other sources include biomass burning (10%), atmospheric deposition (9%) and human sewage (3%).

**Sources of Nitrous Oxides (N2O)**

1. Sources from agriculture
2. Sources from oceans

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. In the United States, the largest source of Greenhouse gases is transportation (29 percent), followed closely by electricity generation (28 percent) and industrial activity (22 percent). Learn about the natural and human causes of climate change.

Curbing dangerous climate change requires very deep cuts in emissions, as well as the use of alternatives to fossil fuels worldwide. The good news is that countries around the globe have formally committed—as part of the 2015 Paris Climate Agreement—to lower their emissions by setting new standards and crafting new policies to meet or even exceed those standards. The not-so-good news is that we're not working fast enough. To avoid the worst impacts of climate change, scientists tell us that we need to reduce global carbon emissions by as much as 40 percent by 2030. For that to happen, the global community must take immediate, concrete steps to decarbonize electricity generation by equitably transitioning from fossil fuel–based production to renewable energy sources like wind and solar, to electrify our cars and trucks and to maximize energy efficiency in our buildings, appliances, and industries.

## 4. How is Global Warming linked to extreme weather?

Scientists agree that the earth's rising temperatures are fueling longer and hotter heat waves, more frequent droughts, heavier rainfall, and more powerful hurricanes.

In 2015, for example, scientists concluded that a lengthy drought in California— the state's worst water shortage in 1,200 years—had been intensified by 15 to 20 percent by global warming. They also said the odds of similar droughts happening in the future had roughly doubled over the past century. And in 2016, the National Academies of Science, Engineering, and Medicine announced that we can now confidently attribute some extreme weather events, like heat waves, droughts, and heavy precipitation, directly to climate change.

The earth's ocean temperatures are getting warmer too—which means that tropical storms can pick up more energy. In other words, global warming has the ability to turn a category 3 storm into a more dangerous category 4 storm. In fact, scientists have found that the frequency of North Atlantic hurricanes has increased since the early 1980s, as has the number of storms that reach categories 4 and 5. The 2020 Atlantic hurricane season included a record-breaking30 tropical storms, 6 major hurricanes, and 13 hurricanes altogether. With increased intensity come increased damage and death. The United States saw an unprecedented 22 weather and climate disasters that caused at least a billion dollars' worth of damage in 2020, but 2017 was the costliest on record and among the deadliest as well: Taken together, that year's tropical storms (including Hurricanes Harvey, Irma, and Maria) caused nearly $300 billion in damage and led to more than 3,300 fatalities.

The impacts of global warming are being felt everywhere. Extreme heat waves have caused tens of thousands of deaths around the world in recent years. And in an alarming sign of events to come, Antarctica has lost nearly four trillion metric tons of ice since the 1990s. The rate of loss could speed up if we keep burning fossil fuels at our current pace, some experts say, causing sea levels to rise several meters in the next 50 to 150 years and wreaking havoc on coastal communities worldwide.

## 5. Effects of Global Warming

Each year scientists learn more about the consequences of global warming, and each year we also gain new evidence of its devastating impact on people and the planet. As the heat waves, droughts, and floods associated with climate change become more frequent and more intense, communities suffer and death tolls rise. If we're unable to reduce our emissions, scientists believe that climate change could lead to the deaths of more than 250,000 people around the globe every year and force 100 million people into poverty by 2030.

Despite the lack of cooperation from the Trump administration, local and state governments made great strides during this period through efforts like the American Cities Climate Challenge and ongoing collaborations like the Regional Greenhouse Gas Initiative. Meanwhile, industry and business leaders have been working with the public sector, creating and adopting new clean-energy technologies and increasing energy efficiency in buildings, appliances, and industrial processes. Today the American automotive industry is finding new ways to produce cars and trucks that are more fuel efficient and is committing itself to putting more and more zero-emission electric vehicles on the road. Developers, cities, and community advocates are coming together to make sure that new affordable housing is built with efficiency in mind, reducing energy consumption and lowering electric and heating bills for residents. And renewable energy continues to surge as the costs associated with its production and distribution keep falling. In 2020 renewable energy sources such as wind and solar provided more electricity than coal for the very first time in U.S. history.

President Biden has made action on global warming a high priority. On his first day in office, he recommitted the United States to the Paris Climate Agreement, sending the world community a strong signal that we were determined to join other nations in cutting our carbon pollution to support the shared goal of preventing the average global temperature from rising more than 1.5 degrees Celsius above preindustrial levels. (Scientists say we must stay below a 2-degree increase to avoid catastrophic climate impacts.) And significantly, the President has assembled a climate team of experts and advocates who have been tasked with pursuing action both abroad and at home while furthering the cause of environmental justice and investing in nature-based solutions.

**Increase in average temperatures**

One of the most immediate and obvious effects of global warming is the increase in temperatures around the world. The average global temperature has increased by about 1.4 degrees Fahrenheit (0.8 degrees Celsius) over the past 100 years, according to the National Oceanic and Atmosphere Administration (NOAA).

**Weather extremes**

Weather extreme is another effect of global warming. Changes in climate can cause the polar jet stream, the boundary between the cold North Polar 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.

Lightening is another weather feature that is being affected by global warming. The researchers of the study found a 12% increase in lightening activity for every 1.8 degree F (1degree C) of warming in the atmosphere.

Scientists project that extreme weather events, such as heat waves, droughts, blizzards, and rain storms will continue to occur more often and with greater intensity due to global warming, according to Climate Central. Climate models forecast that global warming will cause climate patterns worldwide to experience significant changes. These changes will likely include major shifts in wind patterns, annual precipitation and seasonal temperatures variations.

**Ice melt**

One of the most dramatic effects of global warming is the reduction in Arctic sea ice. Sea ice hit record-low extents in both the fall and winter of 2015 and 2016, meaning that at the time when the ice is supposed to be at its peak, it was lagging. It means there is less thick sea ice that persists for multiple years.

Sea levels and ocean acidification: In general, as ice melts, sea levels rise. In 2014, the World Meteorological Organization reported that sea level rise accelerated 0.12 inches (3millimeters) per year on average worldwide. This is around double the average annual rise of 0.07 in. (1.6 mm) in the 20th century.

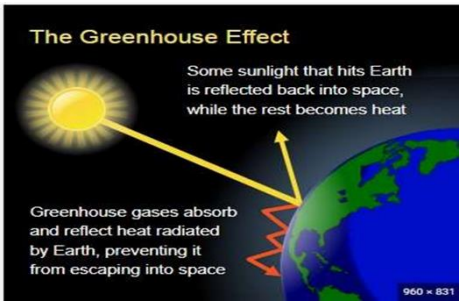
Sea level is not the only thing changing for the oceans due to global warming. As levels of CO2 increase, the oceans absorb some of that gas, which increases the acidity of seawater.

**Plants and Animals**

The effects of global warming on the Earth's ecosystems are expected to be profound and wide spread. Many species of plants and animals are already moving their range northward or to higher altitudes as a result of warming temperatures, according to a report from the National Academy of Sciences.

"They are not just moving north, they are moving from the equator toward the poles. They are quite simply following the range of comfortable temperatures, which is migrating to the poles as the global average temperature warms," Werne said. Ultimately, this becomes a problem when the rate of climate change velocity (how fast a region changes put into a spatial term) is faster than the rate that many organisms can migrate. Because of this, many animals may not be able to compete in the new climate regime and may go extinct.

Warmer temperatures will also expand the range of many disease causing pathogens that were once confined to tropical and subtropical areas, killing off plant and animal species that formerly were protected from disease.




## 6. Is Global Warming too big a problem for me to help tackle?

No! While we can't win the fight without large-scale government action at the national level, we also can't do it without the help of individuals who are willing to use their voices, hold government and industry leaders to account, and make changes in their daily habits.

Wondering how you can be a part of the fight against global warming? Reduce your own carbon footprint by taking a few easy steps: Make conserving energy a part of your daily routine and your decisions as a consumer. When you shop for new appliances like refrigerators, washers, and dryers, look for products with the government's ENERGY STAR® label; they meet a higher standard for energy efficiency than the minimum federal requirements. When you buy a car, look for one with the highest gas mileage and lowest emissions. You can also reduce your emissions by taking public transportation or carpooling when possible.

And while new federal and state standards are a step in the right direction, much more needs to be done. Voice your support of climate-friendly and climate change preparedness policies, and tell your representatives that equitably transitioning from dirty fossil fuels to clean power should be a top priority—because it's vital to building healthy, more secure communities.

You don't have to go it alone, either. Movements across the country are showing how climate action can build community, be led by those on the front lines of its impacts, and create a future that's equitable and just for all.

## 7. Conclusion

There is still time to get rid of the worst impacts of climate change, if we take strong action now. The scientific evidence is now overwhelming: climate change is a serious global threat and it demands an urgent global response. Climate change will affect the basic elements of life for people around the world access to water, food production, health and the environment.

Hundreds of millions of people could suffer hunger, water shortages and coastal flooding as the world warms. A strong action is clearly required. Because climate change is a global problem, the response to it must be international. Climate change could have very serious impacts on growth and development. If no action is taken to reduce emissions, the concentration of Greenhouse gases in the atmosphere could reach double its pre-industrial level as early as 2035, virtually committing us to a global average temperature rise of over 2oC. In the longer term, there would be more than 50% chances that the temperature rise would exceed 5oC. This rise would be very dangerous indeed. So, strong preventions must be needed to control global warming. Otherwise it would have serious impacts on world, on human life and on the environment. Here we have some recommendations to reduce global warming.

## 8. Recommendations for reduction of Global Warming

1. *We should replace our regular light bulbs with compact fluorescent light bulbs as it will save150 pounds of carbon dioxide a year.*
2. *We should travel by walking, by bike, by carpool or take mass transit more often. By doing so, we can save one pound of carbon dioxide for every mile we do not drive.*
3. *We should save 2400 pounds of carbon dioxide per year by recycling just half of your household waste.*
4. *We should keep our tires inflated properly as it improves our gas mileage by more than 3%. Every gallon of gasoline saved keeps 20 pounds of carbon dioxide out of the atmosphere.*
5. *We should use less hot water by taking shorter and cooler showers and washing our clothesline cold or warm instead of hot water. As it takes a lot of energy to heat water (more than 500 pounds of carbon dioxide saved per year).*
6. *We should reduce our garbage by 10% as it can save 1200 pounds of carbon dioxide.*
7. *We should move our thermostat down just 2 degrees in winter and up to 2 degrees in summer, as it could save about 2000 pounds of carbon dioxide a year.*
8. *We should plant trees, as single tree will absorb one ton of carbon dioxide over its lifetime.*
9. *We should turn off our television, DVD player, stereo and computer when we are not using them. It will save thousands of pounds of carbon dioxide a year.*
10. *We should save water as it reduces carbon pollution too. That's because it takes a lot of energy to pump, heat and treat your water.*
11. *We should avoid the use of fossil fuels. Renewable energies like solar, wind, biomass and geothermal energy should be used.*
12. *Artificial cloud seeding should be promoted. As creating man-made clouds by spraying salt water high into the atmosphere would increase cloud cover and reflectivity. Sufficient sunlight would be reflected to compensate for any future release of CO2 into the atmosphere.*
13. *Large amount of iron should be dumped into the oceans; it will spark phytoplankton blooms. Phytoplankton are photosynthetic, needing sunlight and nutrients to grow, taking up carbon dioxide in the process. When the organisms die they sink to the bottom of the ocean, sequestering the carbon dioxide took up.*
14. *You should convert your heating system to the solar energy. In this way you can save electricity, money and your environment from global warming.*

## References

1. *https://www.livescience.com/37003-global-warming.html*
2. *https://whatsyourimpact.org/greenhouse-gases/nitrous-oxide-emissions*
3. *northwestern.edu/fm/fm-staff/10-ways-to-stop-global-warming.html*
4. *https://www.nrdc.org/stories/how-you-can-stop-global-warming*
5. *https://www.vision.org/interview-global-warming-debate-part-one-who-turned-heat- 1183*
6. *studocu.com/in/document/shivaji-university/bsc-chemistry/project-report- on-global-warming*