

# Global Warming and Climate change : Challenges and Solutions

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**Abstract:** *Global warming and climate change are among the most serious problems across the globe in today's world of industrialization. The effects of climate change on various sectors of society are interconnected to each other. On one hand, drought causes a great harm to food production and human health; and on the other, severe floods also the reason behind the spread of lot of diseases and damage to ecosystem and infrastructure. The issue of human health can increase mortality, affect the availability of food, and limit the productivity of workers. The researcher of this paper has made an effort to create awareness about climate change and its impact on society. At the same time, we must also understand about how we all are responsible for creating this problem. Hence, it is our collective responsibility to solve this problem. This study is an effort to spread awareness among all about global warming and climate change along with their impacts on our environment.*

**Keywords:** Climate change, impact environment

## I. INTRODUCTION

Climate change is commonly described as global warming which is ongoing increase in global average temperature along with its effects on climate of earth. In broader sense, climate change also includes previous long term changes to Earth's Climate. The speed of current rise in global average temperature is more than the previous rise, and it is primarily caused by the burning of fossil fuels. Burning of fossil fuels, deforestation, several agricultural and industrial practices increase the emission of greenhouse gases, mainly carbon dioxide and methane. These gases absorb some of the heat that the Earth radiates after it gets warm due to sunlight. Larger amount of these gases trap larger amount of heat in Earth's lower atmosphere which in turn causes global warming.

Due to change in climatic system of earth in the previous century and in present times, deserts are expanding, while heat waves and wildfires are becoming more common. Warming of Arctic causes the melting of permafrost, glacial retreat and ice loss in the oceans and poles. Higher temperatures also cause more intense storms, droughts and other extremities of weather. Rapid environmental changes in mountains, coral reefs, and the Arctic force a number of species to relocate, migrate or go extinct. Now even if efforts to minimize future warming become a success, some effects such as ocean warming, acidification and rising sea levels will continue for centuries.

Climate change will keep creating problems for human beings always. This paper is an effort from the researcher to bring awareness about present dangerous situation and to minimize effect of climate change in order to save environment. The main objectives of the research paper are to study 1) the concept of climate change, 2) impact of climate change, 3) causes of the climate change, and 4) solutions to the climate change.

### Interpretation

#### Concept of climate change

Climate change is a significant change of average weather conditions. Warmer, wetter or drier, over several decades or longer are some of its examples. This long-term trend separates climate change from natural weather variability.

#### Climate Change Knowledge Portal (CCKP)

The climate change knowledge portal (CCKP) provides global data on historical and future climate, vulnerabilities and impacts. This data can be explored through country and watershed views. Synthesized country profiles can also be accessed through CCKP in order to gain deeper insights into climate risks and adaptation actions.

**The World Bank created the climate Change knowledge Portal to solve a need.**

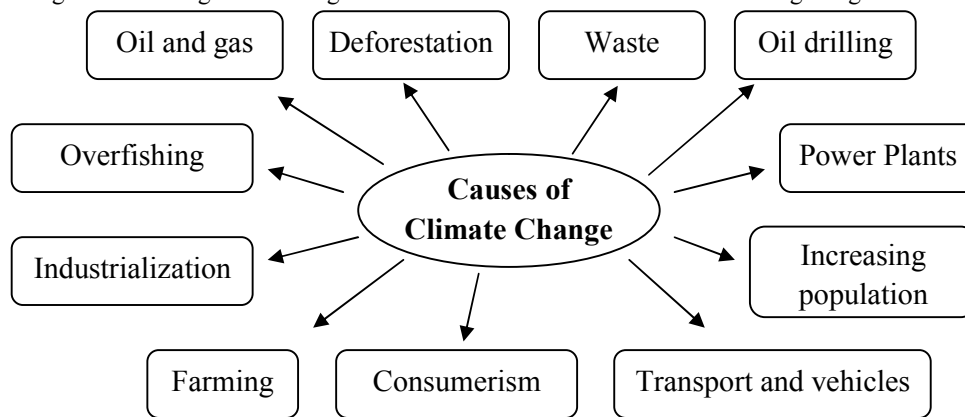
The World Bank created the climate change knowledge portal (CCKP) as an effort to serve as a "one stop shop" for climate related information, data, tools etc.. This portal provides an online tool for accessing comprehensive global, regional, and country data related to climate change and development.

**Definition of Climate change**

Climate change can be defined as long term variations in patterns related to temperature and weather. These shifts may be natural, such as through variations in the solar cycle. However, human activities since the beginning of 19<sup>th</sup> century have been the main cause behind change in global climate, primarily due to burning fossil fuels such as coal, oil, gas etc.

**Causes of climate change**

Some causes of global warming contributing to the climate crisis as shown here in the diagram given below.



**1) Oil and gas**

Oil and gas used all the time in almost every industry. It is used the most in vehicles; buildings, production & to produce electricity. When we burn fossil fuels such as coal, oil, gases etc., they largely add to the climate problem. Burning of fossil fuels is a threat to wildlife & the surrounding environments, because of the toxicity it kills plant life and leaves areas uninhabitable.

**2) Deforestation**

Deforestation is considered as the clearance of forests and agricultural land. This is either done for availing wood or to create space for farms or ranches. Trees & forests turn carbon dioxide into oxygen. Hence when they are cleared, the stored carbon is released into the environment. Deforestation can also occur naturally that has a greater effect because of the fumes released caused by the forest fires.

**3) Waste**

Humans are creating more waste now than ever before, because of the amount of packaging used and the short life cycle of products. A lot of items, waste & packaging are single use and not recyclable. This means that it ends up in landfills. This waste in landfills gradually decomposes to release harmful gases into the atmosphere which in turn contributes to global warming.

**4) Power plants**

Most power plants burn huge quantities of fossil fuels to operate. Due to this, they produce a variety of different pollutants. The pollution caused by them not only ends up in the atmosphere but also in the water ways. Such activities largely contribute to global warming. Burning coal in the power plants is vastly responsible for around 46% total carbon emissions around the globe.

**5) Oil Drilling**

Oil drilling is responsible for 30% of the methane pollution and around 8% carbon dioxide pollution. Oil drilling is used to collect petroleum oil hydrocarbons in this process other gases are released into the atmosphere, which, Contribute to climate change. It is also toxic to the wildlife and environment it surrounds.

**6) Transport and vehicles**

Transportation is mainly done through trucks, buses, cars, planes, boats and trains, almost all of which uses fossil fuels to run. Burning of fossil fuels releases carbon dioxide and several other hazardous pollutants into the atmosphere. Thus, transportation is also very much responsible for increase in the greenhouse gases' effect. This effect is possible to be reduced by using other sources of energy generation such as solar energy, wind energy and by introducing electric vehicles.

**7) Consumerism**

Due to innovations in technology and manufacturing customers are able to purchase any product at any time. This means we are producing more & more products every year, and over producing them. Most items we purchase aren't very sustainable and because of the reduced lifetime of electronics and clothing items, we are creating more waste than ever.

**8) Farming**

Farming takes up a lot of green Space meaning local environments can be destroyed to create space for farming. These animals produce a lot of greenhouse gases such as Methane, Carbon dioxide etc. They also produce an extreme amount of waste. Factory farming is responsible for even more climate issues.

**9) Industrialization**

Industrialization is harmful for the environment in a number of ways. The waste produced due to industrialization produces all ends up in landfills or in our surrounding environment. The chemicals & materials used in the industrialization phase not only pollute the atmosphere but also the soil.

**10) Overfishing**

Fish is among the main sources of protein for humans and most of the world relies on fishing industry for food related demands. Due to a huge amount of people regularly buying and consuming fish, marine life is highly reduced. This is known as overfishing, and it is a vital reason behind a lack of diversity within the ocean.

**11) Population growth**

Due to the rapid rise in population across the world, the pressure on various sectors like industries, energy, agriculture, transportation etc. is increasing globally day by day. This has lead to the sudden increase of the emission of green house gases worldwide. Rapid rise in population has forced us towards the expansion of industries, energy, housing and transport sectors. Loss of agricultural land, deforestation, water and air pollution etc. are among some other major problems that are caused because of population explosion.

**Impact of Climate change**

Impact of climate change is as follows-

- 1) Higher temperatures: As Green house gas concentrations rise, so does the global surface temperature.
- 2) More severe storms.
- 3) Increased drought, longer periods of drought in some region.
- 4) A warming, rising ocean.
- 5) Loss of species.
- 6) Not enough food.
- 7) More health risks.
- 8) Poverty & displacement.
- 9) More frequent wildfires
- 10) Extreme weather
- 11) Diminishing sea ice
- 12) Year after year of record breaking warmth.
- 13) Drought fires.
- 14) Stress to ecosystem.
- 15) Imbalanced environment
- 16) Human Health Issue.
- 17) Impact on food availability.

**Problems caused by global warming**

Entire ecosystems of the earth will be impacted due to global warming. Rising temperatures at the equator are already pushing staple crops such as rice north into once cooler areas. A number of fish species also have migrated long distances to stay in waters that are the proper temperature for them. It is becoming difficult for farmers in temperate zones for crops such as corn and wheat, and once prime growing zones are now threatened. Furthermore, some areas may see complete ecological change. Climate change impacts and warming are going to fundamentally change the forests very soon across the globe. Hundreds of plants species are assumed to disappear worldwide and hundreds more will move over thousands of miles.

**Reduced food security**

One of the most striking impacts of rising temperatures is felt in the field of agriculture also. These impacts however are being felt differently in the temperate and in tropical world. Different crops grow best at quite specific temperatures and when temperature rises, their productivity is significantly altered. Rising temperatures may reduce corn and wheat productivity. The productivity of rice, the staple food of more than one third of the world's population is reduced by about 10% with 1°C rise in temperature. In future, temperature rise may reduce production 25% by 2050.

**Effect of global warming on human health**

Global warming and climate change influences human health and disease in numerous ways. Some existing health threats will intensify and new health threats will emerge. However, not everyone is at equal risk. It varies with considerations such as age, economic resources, location etc.

**Effect of global warming on agriculture**

Climate change can affect agriculture in a variety of ways. Beyond a certain range of temperatures, warming tends to reduce yields because crops speed through their development, producing less grain in the process. And higher temperatures also interfere with the ability of plants to get and use moisture. Evaporation from the soil accelerates when temperatures rise and plants increase transpiration i.e. lose more moisture from their leaves. Climate change is also disrupting weather patterns, leading to extreme weather events, unpredictable water availability, water scarcity and contaminated water resources. These impacts can drastically affect the quantity and quality of water needed for survival. Using water more efficiently and transitioning to solar powered water systems will reduce greenhouse gases and further protect children's futures.

**Effect of Heat waves in Summer Season in India**

Researchers from Hyderabad University have conducted a study and concluded that for the last several years the number of heat waves during summer season has risen while the number of cold waves during winter season has diminished. They have utilized the data of maximum and minimum daily temperatures from 1970 to the year 2019 to examine the days in areas of different climates. The researching team found that the days of abnormally high temperatures are increasing in summers every year while the days of extremely low temperatures during winters are decreasing every year. High temperature continuing for three or more days is considered as a heat wave event. It was found that the incidences of heat wave events are increasing by 0.6 incidences per year. According to recent IMD report in 2023, Indian states of Odisha, Kerala, Maharashtra, Sikkim as well as Northeastern states have to witness above normal temperatures in the days to come in summer season. This rise in temperature can be 3-5 degree Celsius. In northern India, summer is showing its colours since the month of March itself. The Weather department also has warned of heat waves in a number of cities across India. Due to this, the health of common people has also been affected. Cases of cough, cold, flu and viral are being witnessed more and more during these days. IMD has stated that since the year 1901 when the record keeping started for the first time, the month of February has been the hottest in the year 2023. Furthermore, even hotter days are expected to arrive.

**Solutions to the climate change**

1. Keep fossil fuels in the ground
2. Invest in renewable energy
3. Switch to sustainable transport.
4. Help us keep our homes cozy.
5. Improve farming & encourage vegan diets.
6. Restore nature to absorb more carbon

7. Protect forests like the Amazon.
8. Protect the oceans.
9. Reduce how much people consume.
10. Reduce plastic.

Thus we can reduce the problems due to impact of climate change.

## II. CONCLUSION

Climate change refers to change in environmental conditions of the earth. This happens due to many internal and external factors. The climate change has become a global concern over the last few decades. Besides these, climate change affects life on the earth in various ways. Climate change is the most significant problem facing the world. Global warming is also increasing day by day. If we do not prevent it as soon as possible, earth will have to face undesirable consequences. Some recommendations for everyone to fight climate change and global warming are - Drive less, Recycle more vehicles and electronic items, Check your vehicle tires, Use less hot water, Avoid products with a lot of packaging, Adjust your thermostat, Plant trees, Change regular light bulbs with compact fluorescent light bulbs each of which can save 150 pounds of Carbon dioxide a year.

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