

Global Warming: Causes And Effects

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Today the world facing the major problem of global warming and climate change. This paper defines the term global warming and explains the cause and effects of an increase in average temperature of planet's atmosphere & its oceans.

The global climate is the connected system of sun, earth and oceans, wind, rain and snow, forests, deserts and savannas, and everything people do, too.

It is this systemic connectedness that makes global climate change so important and so complicated. Global warming is the term used to describe a gradual increase in the average temperature of the Earth's atmosphere and its oceans, a change that is believed to be permanently changing the Earth's climate forever.

Global warming is the slow increase in the average temperature of the earth's atmosphere because an increased amount of the energy (heat) striking the earth from the sun is being trapped in the atmosphere and not radiated out into space. —*Global temperatures have warmed significantly since 1880, the beginning of what scientists call the —modern record. At this time, the coverage provided by weather stations allowed for essentially global temperature data. As greenhouse gas emissions from energy production, industry and vehicles have increased, temperatures have climbed, most notably since the late 1970s.* NASA

The earth's atmosphere has always acted like a greenhouse to capture the sun's heat, ensuring that the earth has enjoyed temperatures that permitted the emergence of life forms as we know them, including humans.

Without our atmospheric greenhouse the earth would be very cold. Global warming, however, is the equivalent of a greenhouse with high efficiency reflective glass installed the wrong way around.

Causes of Global Warming

There are three positions on global warming: (1) that global warming is not occurring and so neither is climate change; (2) that global warming and climate change are occurring, but these are natural, cyclic events unrelated to human activity; and (3) that global warming is occurring as a result primarily of human activity and so climate change is also the result of human activity.

The claim that nothing is happening is very hard to defend in the face of masses of visual, land-based and satellite data that clearly shows rising average sea and land temperatures and shrinking ice masses.

The claim that the observed global warming is natural or at least not the result of human carbon emissions focuses on data that shows that world temperatures and atmospheric CO₂

levels have been equally high or higher in the past. They also point to the well understood effects of solar activity on the amount of radiation striking the earth and the fact that in recent times the sun has been particularly active.

➤ **Natural Causes**

• **Greenhouse gases (GHGs)**

There are a number of anthropogenic greenhouse gases. These include carbon dioxide (chemical formula: CO₂), methane (CH₄), nitrous oxide (N₂O), and a group of gases referred to as halocarbons.⁶⁰ The emissions reductions necessary to stabilize the atmospheric concentrations of these gases varies. CO₂ is the most important of the anthropogenic greenhouse gases.

There is a difference between stabilizing CO₂ emissions and stabilizing atmospheric concentrations of CO₂. Stabilizing emissions of CO₂ at current levels would not lead to stabilization in the atmospheric concentration of CO₂. In fact stabilizing emissions at current levels would result in the atmospheric concentration of CO₂ continuing to rise over the 21st century and beyond.

The most common and most talked about greenhouse gases is CO₂ or carbon dioxide. In fact, because it is so common, scientists use it as the benchmark or measure of things that warm the atmosphere.

Methane, another important GHG, for example, is 28-36 times as warming as CO₂ when in the upper atmosphere (USEPA GWP – Global Warming Potential – estimate over 100 years), therefore, 1 ton of methane = 28-36 tons eCO₂ or CO₂ equivalents.

The most commonly discussed GHGs are:

- CO₂ or carbon dioxide is produced any time something is burned. It is the most common GHG, constituting by some measures almost 55% of total long-term GHGs. It is used as a marker by the United States Environmental Protection Agency, for example, because of its ubiquity. Carbon dioxide is assigned a GWP or Global Warming Potential of 1.

Methane or CH₄ is produced in many combustion processes and also by anaerobic decomposition, for example, in flooded rice paddies, pig and cow stomachs, and pig manure ponds. Methane breaks down in approximately 10 years, but is a precursor of ozone, itself an important GHG. CH₄ has a GWP of 28-36.

- Nitrous oxide in parent (laughing gas), NO/N₂O or simply NO_x is a byproduct of fertilizer production and use, other industrial processes and the combustion of certain materials. Nitrous oxide lasts a very long time in the atmosphere, but at the 100 year point of comparison to CO₂; its GWP is 265-298.
- Fluorinated gases were created as replacements for ozone depleting refrigerants, but have proved to be both extremely long lasting and extremely warming GHGs. They have no natural sources, but are entirely man-made. At the 100 year point of comparison, their GWPs range from 1,800 to 8,000 and some variants top 10,000.
- Sulphur hexafluoride or SF₆ is used for specialized medical procedures, but primarily in what are called dielectric materials, especially dielectric liquids. These are used as

insulators in high voltage applications such as transformers and grid switching gear. SF₆ will last thousands of years in the upper atmosphere and has a GWP of 22,800.

- **Solar Cycles and Sunspot** Climate is affected through natural changes that impact how much solar energy spread to Earth. Alteration containing in the sun there self can affect vigour of the sunshine that comes to surface & earth. The strength of the sunlight can reason either warming (during periods of stronger solar intensity) or cooling.
- **Continental Drifts**
 - Through the millions of year ago, the land mass started declined drifting apart, the continent that now days we are well-known among what were formed. The detection of fossil of tropical plant within region of Antarctica is approach towards end such a freezing ground on different occasion into earlier period, should have been located nearer towards equator, wherever weather had tropical, for marsh as well as abundance of verdant plants.
- **Volcanoes eruptions**

When a volcano erupts it throws out large volumes of sulphur dioxide (SO₂), water vapour, dust, and ash into the atmosphere. Although the volcanic activity may last only a few days, yet the large volumes of gases and ash can influence climatic patterns for years. Millions of tons of sulphur dioxide gas can reach the upper levels of the atmosphere (called the stratosphere) from a major eruption. The gases and dust particles partially block the incoming rays of the sun, leading to cooling. Sulphur dioxide combines with water to form tiny droplets of sulphuric acid. These droplets are so small that many of them can stay aloft for several years. They are efficient reflectors of sunlight, and screen the ground from some of the energy that it would ordinarily receive from the sun. Winds in the upper levels of the atmosphere, called the stratosphere carry the aerosols rapidly around the globe in either an easterly or westerly direction. Movement of aerosols north and south is always much slower.

➤ **Human Causes**

Human influence has been the dominant cause since the mid-20th century, and atmospheric concentrations of greenhouse gases, already at levels not seen in at least 800,000 years, will persist for many centuries, the final version of the latest United Nations report on climate change warned today.

- Continued emissions of greenhouse gases will cause further warming and changes in all components of the climate system.
- Human influence has been detected in warming of the atmosphere and the ocean, in changes in the global water cycle, in reductions in snow and ice, in global mean sea level rise, and in changes in some climate extremes.
- Human influence has been detected in warming of the atmosphere and the ocean, in changes in the global water cycle, in reductions in snow and ice, in global mean sea level rise, and in changes in some climate extremes. This evidence for human

influence has grown since . It is extremely likely that human influence has been the dominant cause of the observed warming since the mid-20th century.

● **Population Explosion**

- Pollution whether it is vehicular, electrical or industrial is the main contributor to the global warming. Everyday billions of vehicles release various gases into the atmosphere. This causes earth to warm up and increase its average temperature. Electricity causes pollution in many ways.
- Fossil fuels are burnt for e.g. coal is burnt to produce electricity. Coal is the major fuel that is burnt in these power plants. Coal produces around 1.7 times as much carbon dioxide per unit of energy when flamed as does natural gas and 1.25 times as much as oil. Over 75% of the electricity worldwide is produced by burning fossil fuels. Many gases are sent into the air when fossil fuels are burnt of which main is the carbon dioxide gas.
- Industries on the other hand release various gases into the water and air. Carbon dioxide, methane, nitrous oxide is the major greenhouse gases. Different gases have different heat trapping capabilities. Some of them trap more heat than carbon dioxide. Methane is much more effective than carbon dioxide in entrapping heat in the atmosphere. By driving cars, using electricity from coal fired plants and heating up our homes from natural gases, we release carbon dioxide and other heat trapping gases in the atmosphere.

Deforestation

- Deforestation is the cutting down of trees and plants to make way for any development activity. Carbon dioxide is the air that our body lets out when we breathe. Trees take in this carbon dioxide and release oxygen that we breathe in. With the cutting down of more and more trees is leading to greater concentration of carbon dioxide in the air.
- This means that it is very important to protect our trees to stop the greenhouse effect, and also so we can breathe and live. Deforestation is blamed for rise in the greenhouse gases present in the atmosphere by cutting or burning them. New development projects, requirement of land for homes and factories, requirement for wood .and also soil erosion are the major factors that are causing deforestation, which in turn leading to global warming.

Landfills

When we throw garbage out of our house it goes to landfills. Landfills are those big chunks of garbage that you must have seen on some expressway, when you go out of your city, that stink. The garbage is then used by big recycling companies to make some useful products out from that garbage. Most of the time that garbage is burnt which then release some toxic gases into the atmosphere. This enormous amount of toxic greenhouse gases when go into the atmosphere makes global warming worse.

Rapid Industrialization

The industrialization is human induce factor for making global warming & climate change. Industries are generally manufacturing industries important contributor to global warming. Some manufacturing industries such as textile industry as well as chemical industries like fertilizer, pulp & paper, dye stuff etc. uses millions of litters of water & discharge them as sewages. These effluents are pollutants reasoning havoc to fish, cattle & even though near residing people. Various factories especially chemical industries contain air through discharge of a several of pollutant gases such as CO₂ NO, & sulphur etc. All such creates direct pollution through the industries.

Effects of Global Warming

Ecosystem

- . The combination of climate change and associated disturbances like flooding, drought, wildfire, infestation and ocean acidification, in addition to other contributors to climate change such as land use change pollution and over exploitation of resources, will exceed the resilience of many ecosystems. Beyond 2050, terrestrial ecosystems, which play an important role as carbon sinks, may reach the upper limit of the absorptive capacity or even, decrease their net carbon uptake.
- If increases in global average temperature exceed 1.5-2.50C, around 20-30% of plant and animal species may become extinct.
- Ecosystems goods and services, like water and food supply, are adversely affected by projected major changes in ecosystem structure and function, species'ecological interaction and geographic ranges.
- Increasing ocean acidification due to higher CO₂ atmospheric concentrations harm corals, shelled organisms and dependent species.

Climate change

Rapid industrialization with their expanded activities affect the thin layer of the atmosphere that surrounds the earth. Such an effect changes the natural atmosphere and the human civilizations as well as the future generations are going to suffer due to such changes in the natural system that governs the atmosphere. Thus the concentration of greenhouse gases namely the carbon dioxide, methane, nitrous oxide and certain other heat trapping gases contribute in a significant manner for the changes that occur in the atmospheric climate.

Ozone Depletion

Ozone is formed naturally in the upper stratosphere by short wavelength ultraviolet radiation. Thus ozone absorbs the ultraviolet radiation without itself being consumed; the net result is to convert ultraviolet light. Ozone filters harmful ultraviolet radiation from the sun and prevents it reaching the earth. Thus, the ozone layer in the atmosphere plays a significant role in protecting the life on the earth. This layer which exists as a protective cover protects the plants, animals and human life from the direct exposure to the ultraviolet solar radiation by absorbing the unwanted ultraviolet rays and allowing those radiation waves to reach the earth which is essential for all kinds of life forms on the earth. When there is a breakdown of ozone layer we call it as ozone depletion.

Food Production

- Although crops may increase in high and mid-latitudes, once local mean temperatures increases more than 1-30C, they decrease globally.
- Increased risk of hunger in lower latitudes, especially seasonally dry and tropical regions, where crop productivity may decrease for even small changes in local average temperature of 1-20C.
- Substance sectors at low latitudes particularly suffer increasing risks of droughts and floods.
- Adaptations through cultivation cycles may maintain cereal yields if warming remains modest.
- Regional adverse effects are predicted for aquaculture and fisheries.

Coastal systems and low-lying areas

- Coasts will increasingly suffer from erosion and rising sea levels, exacerbated by human-induced pressures
- . Corals and coastal wetlands are seriously affected by even small increases in sea surface temperatures and rising sea levels, respectively.

Industry, Settlement and Society

- There is a clear correlation between climate change and negative effects on industry, settlement and society (ISSS).
- ISSS (industry, settlement and society) in coastal and river flood plains or in areas prone to extreme weather events, and those whose economies depend on climate-sensitive resources, are the most vulnerable.
- Due to a more limited adaptive capacity and greater dependence on food and water supplies, poor communities in high-risk areas are especially vulnerable.
- d. Increased economic and social costs in areas where extreme weather events will become more intense and on those with close linkages to them.

Health

- Widespread effects on the health status of millions of people are projected, hitting hardest the already vulnerable groups in developing countries, through increases in malnutrition and consequent disorders, with implications for child growth and development;
- Increased deaths, disease and injury due to heat waves, floods, storms, fires and droughts.
- Increased burden of diarrheal disease.
- Increased frequency of cardio-respiratory diseases due to higher concentrations of ground level ozone related to climate change.
- Altered spatial distribution of some infectious disease vectors.
- The earth's climate is dynamic and always changing through a natural cycle. What the world is more worried about is that the changes that are occurring today have been speeded up because of man's activities. These changes are being studied by scientists

all over the world who are finding evidence from tree rings, pollen samples, ice cores, and sea sediments. The causes of climate change can be divided into two categories- those that are due to natural causes and those that are created by man.

Conclusion

Global Warming have causes many problem for human but we human who make global warming happens. Many people have died because of disease or disaster. It also affects the economics of the country. However, we need to be reduce the global warming by using less gasoline, recycle and human should help to reduce global warming instead of making the earth temperature increased. Our generation should start taking care of the earth because in the next generation they will suffer if we do not do reduce global warming.

References

- Kadyan Neelam (2014). “Menace of Global Warming a Socio-Legal Study” Research Thesis Maharishi Dayanand University.
- Shelke Sagar Velas (2017). “Global Warming and its Socio-Legal Impact on Climate of India.” Research Thesis Shri Jagdish Prasad Jhabarnal Tibarewala University.
- <https://www.ukessays.com/essays/environmental-sciences/causes-effects-and-solutions-to-global-warming-environmental-sciences-essay.php>
- https://warmheartworldwide.org/climate-change/?gclid=CjwKCAjwk6P2BRAIEiwAfVJ0rIt66sguHt1SmosRyRw6l1p76YIvkd-auNs-n0rLnb043mrhkrcfJBoCoaQQA_vD_BwE