Global Warming: Causes and Consequences

Dr. Alka Misra

Department of Zoology, DSN PG College, Unnao

Abstract:
Global warming is the long-term warming of the Earth's overall temperature. Though this trend has been going on for a long time, its pace has significantly increased in the last hundred years. This change has disturbed the climatic pattern of the earth. Still, most people are unaware of global warming and do not consider it to be a big problem in years to come. There are several causes of global warming, both natural and man-made, has negative effects on humans, plants and animals. The natural causes include a green house gas, volcanic eruption, water vapours, melting glaciers, frost blazes and more. Man made causes are burning of fossil fuels, deforestation, use of vehicles, industrial development, agriculture, overpopulation and more. However, the process of global warming occurs when green house gases primarily CO_2 , oxides of nitrogen, sulphur dioxide, methane, chlorofluorocarbons etc. are released into atmosphere. The consequences of global warming are measurable and visible. The most obvious consequence of global warming is rise in temperature of planet, ultimately lead to threats of the ecosystem, climate change, spread of diseases, high mortality rates and loss of natural habitat.

Keywords: Global warming, Climate change, fossil fuels, deforestation, green house gases, green house effect

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INTRODUCTION

Global warming is a gradual, long-term increase in the average temperature of the earth's atmosphere over the past 20,000 years, happens mostly in the troposphere, the lowest level of the atmosphere, which extends from earth's surface up to a height of 6-11 miles. This layer contains most of Earth's clouds and is where living things and their habitats and weather primarily occur. The continuous rise in temperature is really upsetting. The root cause for this is global warming. The gaseous mantle, the atmosphere, forms an insulating blanket around our globe and allows a considerable portion of solar radiations to enter right up to the surface of earth, which absorbs it and radiates back infrared and heat waves. This consequently heats up the surface of the planet and atmosphere, making life feasible. As the Earth warms up, this solar energy is radiated by thermal radiation and infrared rays, propagating directly out to space thereby cooling the Earth. However, some of the outgoing radiation is re-absorbed by green house gases in the atmosphere and is radiated back to the surface of Earth (Hansen *et al*, 2007) leading to increase in temperature and their impact is known as the Green House Effect.

CAUSES OF GLOBAL WARMING

Natural cycles and fluctuations have caused the earth's climate to change several times over the last 800,000 years. Current era of global warming is directly attributed to human activity - specifically burning of fossil fuel such as coal, oil, gasoline and natural gas, which results in the green house effect. Still the largest source of green house gases is transportation (29%) followed closely by electricity production (28%) and industrial activity (22%) worldwide.

There are a number of gases present in the atmosphere, which are capable of absorbing effectively heat waves and infrared rays while being transparent to radiations of lower wavelengths. Carbon dioxide methane, oxides of nitrogen, sulphur dioxide, chlorofluorocarbons (CFCs) and water vapours are some of the gaseous constituents of troposphere (Asthana and Asthana, 2006).

Carbon dioxide is one of the most important green house gas of which about 18 billion tons are being introduced annually. Excessive burning of Fossil fuels like coal and oil is the major factor for producing this gas. Deforestation i.e. removal of trees and emission from industries also causes large amount of carbon dioxide in the atmosphere. Between the years 1980-90, Carbon dioxide has been estimated to be responsible for at least about 55% of rise in temperature globally. The concentration of this gas is still raising continuously poses alarming situation.

The second major cause of global warming is the depletion of ozone layer. This happens mainly due to the presence of chlorine containing source gases. When ultraviolet light is present, these gases dissociate releasing chlorine atoms which then catalyses ozone destruction. With the excessive use of air conditioners and refrigerators, humans have been adding CFCs into the environment which affects the atmospheric ozone layer. The ozone layer protects the earth surface from the harmful UV rays emitted by the sun. The CFCs have led to ozone layer depletion making way for the UV rays, thereby increasing the temperature of the earth. CFCs represent colourless, odourless, easily liquefiable chemicals, which have more potential for global warming than others. Between the years 1980-90, these gases were responsible for 24 % of global warming. Till 1985, about 15 million tons of these compounds had been released in the atmosphere. In spite of much International efforts to check the use of these chemicals, CFCs are still rising at a rate of about 5% per year. Methane (produced by organic matter decay) and Nitrous oxides (emitted majorly by vehicles in the environment) are other troublesome green house gases, which are responsible for rise in temperature.

About 70% of earth's surface is covered with water where from an enormous quantity of water evaporates, introduces a substantially large amount of water vapours into the atmosphere. Water vapour like any other green house gases contributes significantly to the global warming. (Serruya and Polinger, 1983). With an overall rise in temperatures the rate of global evaporation shall also go up which shall introduce more water vapours into the atmosphere and could in turn influence of pattern of global warming.

CONSEQUENCES OF GLOBAL WARMING

Global records of earth's surface temperatures indicate that a warming of about 0.5^0 C (0.3^0-0.7^0C) has occurred during the last century alone. Results from recent climate models suggest that mean global temperatures shall rise by 2^0-6^0 C during the next century, if we don't improve and keep producing greenhouse gases like current situation. During the last great Ice age, about 12,000 years ago, when much of the North America and Europe was covered with a sheet of ice, the mean surface temperatures were only about 5^0C lowers than today. While the transition from the great Ice age to present day climate during which, average temperature rose by 5^0C took almost twelve thousand years. Global warming produces many negative effects, some of which are described here.

As evident from above discussion, temperature anomalies are projected to increase in coming years. Before the 20th century, the situation was well under control but from the beginning of the current century, the situation started worsen. This was all due the continuous production and emission of harmful gases by use of petroleum vehicles, industries etc., which cause the planet to heat up (Shahzad, 2015).

While tropics shall expand, world's climatic belts shall shift away from equator while polar areas shall shrink. The rise in global temperature shall not be uniform all over the surface area of the world. Polar areas of the world would undergo huge rise in temperature instead of tropics. During the Ice age the fertile regions of the world, due to the warming currently, has shifted and changed into drier region. For example, in India, the deserts of Rajasthan could expand right up to Punjab, Delhi and western part of Uttar Pradesh while eastern part of India shall experienced moderate changes. Global warming has led to a change in climate conditions. There are droughts at some places and flood at some. This climate imbalance is also the result of global warming.

As discussed above, due to excessive heat in atmosphere the water evaporates more from sources in the form of vapours, this leads to drought in the regions where increased evaporation process is not compensated by increased precipitation. In some areas of the world, this result in crop failure and infertility, while the extra water vapour content in the atmosphere will fall again as extra rain hence causes floods in various regions of the world.

It is further expected that global rise in temperature shall enhance the rate of already rising sea levels in two ways. Firstly, large deposits of Ice present on earth's surface shall melt which will add more water to the oceans. The towns and villages which are dependent on melting water from snowy mountains will suffer drought and scarcity of water supply in future, because the glaciers all over the world are shrinking at a very rapid rate, lead to increase in ocean levels (www.bgs.uk.news, 2015), resulted low lying areas shall be submerged. Secondly rise in temperature shall also cause thermal expansion of upper layer of water and will lead to rise in water levels in oceans. Due to an increase in floods, tsunamis and other natural calamities, the average death toll usually increases. Also, such events can bring about the spread of diseases that can hamper human life.

Global warming has affected the coral reefs that can lead to the loss of plant and animal lives. Increase in global temperature has made the fragility of coral reefs even worse.

A global shift in the climate leads to the loss of habitats of several plant and animals. In this case, the animals need to migrate from their natural habitat and many of them even become extinct. This is yet another major impact of global warming on biodiversity (Mather and Feddema, 1986). In another words, green house warming shall bring with it an entirely new environment in which life though not impossible yet its existence shall be tougher to maintain.

Insects, pests and pathogens may increase as warmer conditions could be more favorable to their growth leading to spread of pathogenic diseases. New unforeseen diseases of plants, animals and man shall appear and could acquire the dimensions of an epidemic. Researchers have already noticed significant rise in Malaria, Dengue fever, Lyme disease worldwide due to extreme climate change. Moreover, it is an established fact that warmer temperature lead to dehydration which is a major cause of kidney stones. Excess heat can cause stress which may lead to blood pressure and heart diseases.

CONCLUSION

The hazards caused by global warming are tremendous. Excessive use of fossil fuels such as coal, natural gas oil plays a part in it too. In previous decades, emission of green house gases is increasing at a very high rate due to increasing population and deforestation. Our actions are not in favour of protecting the environment. The impacts of climate change on people and nature are increasing apparent. Unprecedented flooding, heat waves, and wild fires have cost billions in damages. Habitats are undergoing rapid shifts in

response to changing temperature and precipitation patterns. To prevent these problems, some remedial steps must be taken which include but are not limited to the use of renewable sources of energy, stopping use of fossil fuels and deforestation immediately. Innovative solutions must be applied to end this hazard once and forever. If we all do not take precautions now and change our lifestyle today, we will definitely have to face serious consequences in the future.

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REFERENCES

1. Hansen J, Makiko S, Pushker K, Gary R, David WL and Mark S (2007) Climate change and trace gases. Phil. Trans. R. Soc. (A), 365, 1925-1954.
2. Asthana DK and Asthana M (2006) A Text book of Environmental Studies. S Chand Publication, New Delhi.
3. Serruya C and Polinger U (1983) Lakes of the warm belt. Cambridge Univ. Press, Cambridge.
4. Shahzad U (2015) Global Warming: Causes, effects and solutions. Durreesamin Journal, 1(14), 1-7.
5. www.bgs.ac.uk/discovering geology/climate change (2015) Consequences of greenhouse effects temperature rises. 23 May.
6. Mather IR and Feddema J (1986) Hydrologic consequences of increases in trace gases and carbon dioxide in the atmosphere. Proc. UNEP and US EPA, International Congress, Washington DC.