

# Global Warming and Climate Change

Abhishek Goel

*Pursuing B.Tech.*

**Abstract-** *The Global Warming lead to Climate Change which has become a threat to the evolution and development of humans as well as other creature on the earth. Increase of Green House Effect lead to global warming and climate change. Actually, the Green House Effect, itself, is not a bad thing. Green House Effect allows earth to stay warm enough to survive for humans and creatures. Chlorofluorocarbon (CFCs) on the earth depletes the ozone layer of the atmosphere and allows the ultraviolet rays to enter the earth. Increasing global temperatures are resulting broad changes which includes melting of polar ice caps, rise in sea level. Entire ecosystem virtually affects by all these things. Reduce carbon and green house gases emission in atmosphere, before it is too late, is the only answer to this problem. Saving energy and developing alternative energy sources would help to minimize global warming up to some extent. Humans, like other species, will have to contribute in changing the world. Each of us can raise our contribution towards it by reducing use of greenhouse gas producing energy, less driving, choosing fuel efficient cars and appliances like refrigerators and heaters etc. Mitigation of individuals, industries and governments may be able to reduce some of anticipated effects of global warming. Better late than never, it is a wakeup call for us to save earth and to save ourselves in order to protect the health and well being of present and future generations. GLOBAL WARMING is not only warming, but also a GLOBAL WARNING.*

**Keywords –** *Green House Effect, Chlorofluorocarbons, fuel efficiency, future generations, warning.*

## I. INTRODUCTION



Fig.1

The fast changing trend in climate and global warming(Fig.1) has challenged life on the earth - the only planet where survival is possible due to its environment that supports life. The Global Warming lead to Climate Change which has become a threat to the evolution and development of humans as well as other creatures on the earth. Scholars and Researchers say that Chlorofluorocarbons (CFCs) available on the earth are

depleting the ozone layer of the atmosphere thereby allowing the ultraviolet rays of sun resulting which global warming and change in day-to-day climate. It is an alarming situation which compels humans to re-think over its evolutionary activities.

## II. PROPOSED METHODOLOGY

In order to understand the global warming and climate change, it is necessary to know about Green House Effect as increase of Green House Effect lead to global warming and climate change. Actually, the Green House Effect, itself, is not a bad thing. Green House Effect allows earth to stay warm enough to survive for humans and creatures. This is not a perfect analogy, however, we can think of the Earth like our car standing in a parking lot on a hot day. We probably felt that our car is much hotter inside than the outside one if it is been sitting inside for a while. How it happens? The sun rays enter through our car's windows and some heat entered in the car is absorbed by the seats, the dashboard and the carpeting and floor mats. When these objects released this heat, it doesn't get out all through the windows. Some heat is reflected back in. Now, the heat radiated by seats is a different wavelength than the light of the sun which made it through the windows at the first place. Finally, a certain amount of heat is going in, and less heat is going out. The result is a gradual increase in the temperature inside our car. But the Green House Effect is some more complicated than our hot car. When the sun's rays hit the Earth's atmosphere and its surface, 70 percent (Approx) energy stays on the planet absorbed by land, oceans, plants and other things. Remaining 30 percent is reflected into space by snow fields, clouds and other reflective surfaces. Even 70 percent that gets through doesn't stay on earth forever, otherwise the Earth would become a fireball. The Earth's oceans and land masses lastly radiate heat back out. Some of back out heat makes it into space. The rest ends up getting absorbed when hits certain things in the atmosphere, such as carbon dioxide, methane and water vapors. After absorption all this heat by these components in our atmosphere, they emit energy which is also in the form of heat. Heat, which doesn't make it out through Earth's atmosphere, keeps the planet warmer than it is in outer space, because more energy is coming in the earth through the atmosphere than what is going out. This is the part of the Green House Effect which keeps the Earth warm.

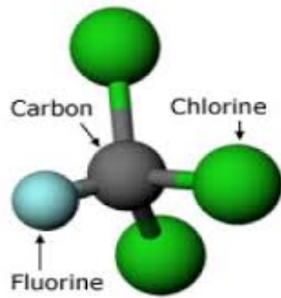


Fig.-2

Now, we must also know about the main content i.e. CFCs responsible for global warming and climate change. CFCs are non-toxic, non-flammable chemicals in the atmosphere which contains atoms of Carbon, Fluorine and Chlorine (Fig.2). These chemicals are used in manufacturing of aerosol sprays, blowing agents for foams and packing materials (as solvents) and as refrigerants. Their usage are increasing heavily over the years. One of the major elements in CFCs is chlorine. Very little chlorine exists naturally in the atmosphere. CFCs are playing a vital role introducing chlorine into the ozone layer. The ultraviolet radiation at this altitude breaks CFCs, freeing the chlorine. Under appropriate conditions, this chlorine has the potential to destroy large amounts of ozone. This has been observed and consequently levels of genetically harmful ultraviolet radiation have been increased. Black carbon is second place for its contribution to increase carbon dioxide in the atmosphere which leads to global warming. Most of the countries have banned the usage of aerosols but these gases are still found here and there in refrigerators, air conditioners and foam packaging.

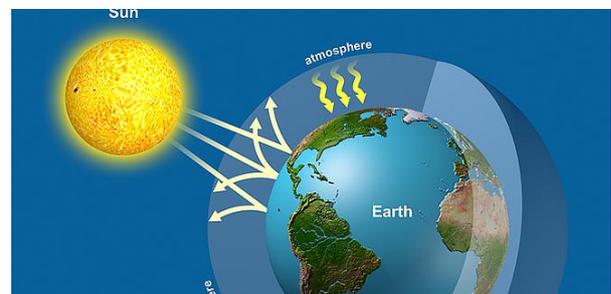


Fig.-3

For the sake of development, with the passage of time, life styles of the humans have completely changed and people gradually stuck to luxurious living. Another cause for increase in heat is misuse of natural resources. Deforestation (Fig.-3) destroyed the forest land and increased carbon dioxide into the air resulting which increase of long-wave radiation trapping the heat. We have not only lost millions acres of rainforest in a year but also lost wildlife habitats which is our natural environment and most significantly, created a non-regulated air and

ocean temperature. The Inter-Governmental Panel on Climate Change (IPCC) in its report given in the year 2014 cleared that most of global warming is caused by increasing green house gases and other human activities. The IPCC Special Report provided a comprehensive, state-of-the-art examination of the scientific and technical effects of Carbon sequestration and Global Carbon Cycle. It also examined conservation, sustainable resource management and development issues, environmental and socio-economic issues related to carbon sequestration. This report will play pivotal role for government policymakers, business/industry analysts, environmental groups, and researchers/scholars in global change, atmospheric chemistry, soil science, and economics.

Automobiles are contributing Black Carbon in the atmosphere in the form of smoke and responsible for increase in global warming and climate change. Human interest is increasing in latest Electronic gadgets which are also increasing the carbon level in the atmosphere. Human activities have lead to changes in the delicate layer of atmosphere which helps in maintaining the temperature of earth. Accumulation of green house gases like methane, CFCs, Water Vapors and most importantly carbon dioxide are increased which does not allow harmful infrared radiations to escape in space thereby leads to increase in global temperatures day by day.



(Fig.-4)

In order to understand the sources of the problem of global warming, we have to bear in mind a very simple principal scientific fact that the carbon dioxide in the atmosphere follows the same graph as the earth's surface temperature. As the carbon dioxide level in our atmosphere goes up the global temperature rises. The reason for rise in temperature is that carbon dioxide, along with the several other gases, traps the sun's heat in the Earth's atmosphere creating a "Green House Effect". The Green House Effect (Fig.-4) is the process of absorption and emission of infrared radiation by gases in a planet's atmosphere and keep warm its lower atmosphere and surface.

Increasing global temperatures are resulting broad changes which includes melting of polar ice caps, rise in sea level etc. According to the National Snow and Ice Data Center

(NSIDC), on our planet, there are 5,773,000 cubic miles of water, ice caps, glaciers, and permanent snow. Melting mountain glaciers and the ice sheets of Greenland and Antarctica melting or sliding into the oceans caused Continuous rising of sea level thereby expanding ocean water. Rising sea level results coastal floods, coastal erosion, increased salinity of rivers, bays and aquifers and shore-line retreat. Global warming further effect of diseases like malaria which is returning into areas where they have been eradicated earlier. Decreasing crop yields and populated areas due to flooding, significant effects to humans are there which includes the threat to food security.

History gives sufficient indications that many societies have faced collapse due to degradation of natural resources. Ancient civilizations were collapsed largely due to prolonged and serious drought and other severe climate changes. High sea-temperature and climate change has caused major coral bleaching events which expels their colorful algae. Entire ecosystem virtually affects by all these things.

Saving energy and developing alternative energy sources would help to minimize global warming up to some extent. Each of us can raise our contribution towards it by reducing use of greenhouse gas producing energy, less driving, choosing fuel efficient cars and appliances like refrigerators and heaters etc. and using non-conventional energy sources. Our actions now and in the coming years will have effective implications for our future generations. A society can contribute towards global warming which includes adaptation to its effects, building systems resilient to its effects, migration by emission reduction and possible future climate engineering. Most of the countries are parties to the United Nations Framework Convention on Climate Change (UNFCCC). The ultimate objective of UNFCCC is to guard and prevent dangerous anthropogenic climate change. UNFCCC has adopted a wide range of policies which were designed to reduce green house emissions and to help in prevention to global warming. Naturally occurring amounts of green house gases on the earth has a mean warming effect of about 33 degree Celsius. In the absence of atmosphere on Earth, the average temperature of the Earth would be much below the freezing point as of water. Eminent atmospheric scientists told us that this trend of long term warming poses serious risks to our environment. This trend poses higher risks for countries having longer coastal line in particular to the poorer countries as they are far less able to cope with climate change. Rising of sea level will cause significant damage to these countries. Thus, sustained and concerted efforts are required to deal with the challenge of global warming and climate change by all the Nations.

### III. SIMULATION RESULTS

In 1824, this effect was proposed by Joseph Fourier; in 1860, discovered by John Tyndall; in 1896, first investigated quantitatively by Svante Arrhenius; in 1930s through 1960s developed by Guy Stewart Callendar. Up to some extent, climate change/global warming can be linked with "over population" and countries like China and India have contribute more to global warming. Also we are not forget to know that India's dirty-coal belt in North Chota-nagpur plateau is in the heart of India has much coal fired Thermal Power Stations. One of the main causes of increase in heat/Climate Change is the rising level of carbon emissions which caused by burning fuels such as oil and coal to power cars, planes, houses and factories. Millions of cars running on the roads each day emitted carbon dioxide resulting in global warming/ Climate Change.

United States (U.S) Government, in February 2002, announced a strategy in order to reduce emission of greenhouse gases by 18% over a 10-years period from 2002-2012. This strategy involves reducing emissions through improvement in technology and its dissemination, improving the efficiency of energy use and voluntary programs with industries in order to shifts to clean fuels. Other United States and International Policies viz. The Climate Change Science Program and The Climate Change Technology Program have been reinstated with broad objectives of reducing emission of greenhouse gases through international co-operation. Since the Governments of our world continue to understand and know the threat of global warming/Climate Change to our livelihood, we are much closer to reducing emission of greenhouse gases to a manageable size. A perpetual blanket of haze of particulate matter incessantly having been under spewed from thermal power stations, the people, in entire plateau region, lack good health. However, rich countries have a lot to do themselves as yet. There were agreed reasons for developing countries for their exemption from initial greenhouse gas emission targets. It was the emission from rich countries which accumulated in the atmosphere for so long to raise climate change.

The Eminent author namely Mark Twain once remarked that everybody talked about the weather, but nobody ever did anything for it. Each of us has to begin with the journey. Winds of change will definitely transmit the message of going green from our children to our families. From families, it will moves to our Society. A need has arisen to understand that the needs of the present generation are to be met without any compromise on the ability of the future generation to meet their needs. There will be an increased chance of stronger and more life-threatening storms as warmer air brings heavier storms. As

per the observations of the Inter-governmental Panel on Climate, water is already a scarce commodity in Africa and will have less and less water with warmer temperatures. This issue could even lead to more conflict and war. Further, in the United States (US), Global warming has caused heavy rains due to warm air having the ability to hold more water vapor than cool one. Floods which have impacted the US since 1993 have caused over \$25 billion losses alone. Not only, with increased floods and droughts will our safety be affected, but also the economy. Plants absorb the greenhouse gas Carbon Dioxide (CO<sub>2</sub>) from the atmosphere for its photosynthesis. Photosynthesis is the process of conversion of light energy into chemical energy by living organisms. Increased forests will help to remove CO<sub>2</sub> from the atmosphere and alleviate global warming to maximum extent. Although it is having a small impact, but this would definitely help in reducing one of the most significant greenhouse gases i.e. (CO<sub>2</sub>) contributing to global warming and climate change.

'The inconvenient truth', an Al Gore's film has made an attempt to give a message to inform us about the coming disaster caused by global warming and climate changes. Solution to check the global warming and climate change revolves around mitigation, sustainable development and green energy approaches. Mitigation of individuals, industries and governments may be able to reduce some of the anticipated effects of global warming. However, no amount of mitigation will prevent most of the effects enumerated in the film from taking place over the next few decades. Humans, like other species, will have to contribute in changing the world. A renowned philosopher has rightly said, "Ask not what the environment can do for you, but what you can do for the environment!!" There will also be a loss in tourism as mangroves, coral reefs, and the general aesthetic appeal of these natural environments are degraded further. In developing countries in the Asia, a disaster occurs between productivity and global warming cycle. Natural resources are required for heavy industrialization and urbanization which in turn immense numerous amounts of greenhouse gases and thus depleting the natural resources needed for further development of the country. A new and more efficient way to use energy has to be find out without which we will be depleted of our natural resources needed for our planet to thrive.

#### IV. CONCLUSION

Better late than never, it is a wakeup call for us to save earth and to save ourselves in order to protect the health and well being of present and future generations. Let's all of us join hands and to promise to save our earth from this Global Warming. Reduce carbon and green house gases emission in atmosphere, before it is too late, is the only

answer to this problem which can be summed up in one line. that GLOBAL WARMING is not only warming, but also it is a GLOBAL WARNING.

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