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# GLOBAL WARMING

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**Abstract:-**Due to increase in emission of greenhouse gases, temperature of our mother earth is going on increasing leading to Global Warming. Global climate will continue to change. It may lead to increase in temperature, rise of sea levels, depending on the amount of heat-trapping gases emitted globally. We all have to come together to save our mother earth.

**Keywords:**Greenhouse gases, fossil fuel, global climate change, global temperature, human activity, climate change, recent report, sea surface temperature, greenhouse gas emission, united nation intergovernmental panel.

## INTRODUCTION :-

Global Warming is defined as the increase of temperature of Earth due to effect of emission of greenhouse gases which trap heat that would otherwise escape from Earth. It may be caused due to emission of carbon dioxide by burning of fossil fuels or deforestation. Scientists believe that the main cause of global warming is the "greenhouse effect". Gases, like water vapor and carbon dioxide which respond physically or chemically to changes in temperature are seen as "feedbacks."

It is believed that human beings are responsible for increase in green house gases. Intergovernmental Panel on Climate Change (IPCC) (2001), United Nations have estimated that the global average land and sea temperature has increased by 0.6 ±0.2◦C since the mid-19th century. IPCC has concluded that if no specific actions are taken to reduce greenhouse gas emissions, global temperatures would be likely to rise between 1.4 and 5.8◦C from 1990 to 2100.

Gases causing greenhouse effect are water vapor, carbon dioxide ($CO_2$), methane, nitrous oxide, chlorofluorocarbons (CFCs).

Carbon dioxide ($CO_2$) is a minor but very important component of the atmosphere. It is released through natural processes such as respiration, volcano eruptions. Excess carbon dioxide ($CO_2$) in the atmosphere is acting as a blanket, trapping heat and warming the planet and it is considered as the major cause of Global warming. This is caused by deforestation, burning of the fossil fuels like coal, oil and natural gas for energy.

Methane ($CH_4$) is the second most prevalent greenhouse gas emitted in the United States. Methane is emitted from wetlands, industry or leakage of natural gases, agriculture, and waste management activities. Methane is a more potent and efficient greenhouse gas than $CO_2$ in trapping radiation but $CO_2$ is 200 times more in the atmosphere. Also methane's lifetime in the atmosphere is much shorter than carbon dioxide $CO_2$. So it is calculated that methane contributes 28% of the warming of $CO_2$. Methane reacts with ozone in a 'chain' reaction and produces $CO_2$ and water vapor.

$$3CH_4 + 4O_3 \longrightarrow 3CO_2 + 6H_2O$$

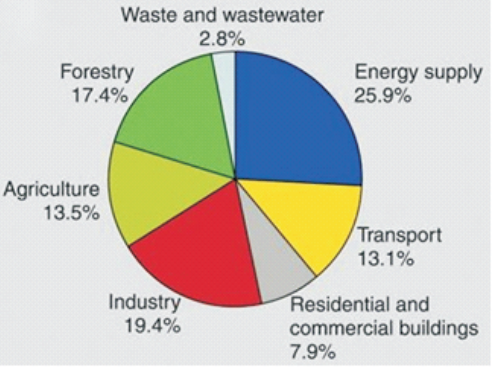
Oxidation of methane is the main source of water vapor in the upper stratosphere.

Water vapor is considered as a critical component of climate change and most abundant greenhouse gas on Earth. It acts as a feedback to the climate. More heat is absorbed by more water vapor leading to increase in temperatures. Water vapor feedback can amplify the warming effect of other greenhouse gases, such that the warming brought about by increased carbon dioxide allows more water vapor to enter the atmosphere.

Nitrous oxide is considered as a powerful greenhouse gas. It is naturally present in the atmosphere as part of nitrogen cycle and also produced by soil cultivation processes. It is produced by fossil fuel combustion, nitric acid production, biomass burning, industry activities and transportation. An average life of Nitrous oxide is 114 years before it is destroyed by chemical reactions. However studies have shown that the impact of 1 pound of $N_2O$ on warming the atmosphere is almost 300 times that of 1 pound of carbon dioxide.

Chlorofluorocarbons, are extensively used for the purpose of refrigeration, as propellants in aerosols and in air

conditioning. Free chlorine atoms are released by action of ultraviolet (UV) radiation from the Sun. This results in depletion of ozone layer. CFCs have long lifetimes. Though they are present in very small amount in the atmosphere, they contribute significantly to increase greenhouse effect by trapping heat. According to international agreements made in Montreal, Canada, in 1987, use of CFCs has been decreased, after it was discovered that they cause depletion of ozone layer.




Pie chart for a breakdown of heat-trapping global warming emissions by economic sector.

**Effects of Global Warming:**

Global climate change has already had observable effects on the environment. Effects that scientists had predicted have already started occurring like loss of sea ice, rise in sea level, more intense heat waves. Glaciers have shrunk, ice on rivers and lakes is breaking up earlier, plant and animal ranges have shifted and trees are flowering sooner.

Further if measures are not taken to reduce emission of greenhouse gases, the temperature will go on rising due to absorption of green house gases. Further the temperature rise will not be uniform or smooth across the country or over time. Ecosystem and agriculture will be affected.

Droughts in the Southwest and heat waves are projected to become more intense, and cold waves less intense everywhere. Summer temperatures will go on rising, and there will be reduction of soil moisture.

Sea level will rise 1-4 feet by 2100 due to melting of ice and expansion of seawater as it warms. Also rise in sea level along with high tides will increase flooding in many of the regions. Hurricanes will become stronger and more intense. The Arctic Ocean will become ice free in summer before mid-century. Due to extreme weather conditions there may be outbreak of diseases.

**Solutions to Global Warming:**

From rise of temperature to rise in sea levels, each challenge requires suitable solutions to reduce the impacts of global warming. It is a problem of serious concern. Many strategies have to be adopted and developments have to be made to control emission of green house gases and reduce global warming. Some of the solutions are:

• Global warming can be reduced by preventing deforestation and planting more trees.

• Energy efficiency technologies, to save energy should be adopted to reduce power consumption at home, offices and industries.

• The emissions caused by using transport/vehicles have increased at a very fast rate. More efficient- mass transportation systems should be adopted instead of private vehicles. Moreover, low-carbon fuels should be used. Nitrous oxide is a byproduct of fuel combustion, so reducing mobile fuel consumption in motor vehicles can reduce transportation emissions. Fuel switching is an effective way to reduce industrial emissions of $N_2O$.

• Emissions of methane gas can be reduced by upgrading the equipment used to produce, store, and transport oil and gas. Emission controls that capture landfill $CH_4$ are an effective reduction strategy.

• Renewable energy sources such as solar, wind, geothermal and bioenergy should be deployed which are cost-effective and reduce pollution.

• Use of fossil fuels should be reduced. Coal-burning power plants should not be made and carbon emissions from power plants should be stored.

• Research is going on development of new zero-carbon technologies to ensure sustainable development.

**CONCLUSION:**

Global warming has caused a negative impact on environment all around the world. Our goal is to restore the environment while creating economic development. This is only possible if all come together to solve this problem and by adapting above mentioned measures for a greener, cleaner and healthier environment.

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