

# GLOBAL WARMING : GLOBAL WARNING

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## **Abstract**

The sun energy is emitted as heat radiations. Some of these are absorbed and retained by the earth's surface. Then again some of the absorbed heat is re-radiated by the earth into the atmosphere. There is an energy balance between the heat energy reaching the earth and the heat energy i.e. radiated into the space. This energy balance determined the earth's surface temperature. Excess accumulation of some gases like carbon dioxide, methane, chlorofluoro carbons(CFS). Ozone and water vapour are responsible for increasing heat on the earth. These gases are known as green house gases. These gases trap the earth heat and causes global warming.

The problem of Global Warming is mainly generated by energy production and by the Chloroflourocarbongases, Deforestation & agriculture. Global warming create a some serious problems like green house effect, acid rain, rise of sea level, melting glacier, depletion of ozone layer.

**Key words:** Global Warming, Green House, Energy.

Green house effect means, "Progressive warming up of the earth's surface due to the balanketting effect of man made carbon dioxide in the atmosphere. A green house is meant for plants mainly in the cold countries where total insolation atleast during winter season is not sufficient enough to support plant growth. The glasses of green house are such that these allow visible sun light to enter but prevent the long wave infrared rays to go out. When there is an increase in carbon dioxide concentration the thick layer of this gas prevents the heat from being re-radiated out. This thick carbon dioxide layer allowing the sun light to filter through but preventing the heat from being re-radiate in outer surface. This is called green house effect. While most heat is observed by carbon dioxide layer and water vapour in the atmosphere which adds to the heat that is already present. The net result is the heating up of the earth atmosphere. Thus increasing CO<sub>2</sub> level tend to warm the air on global scale in the lower layer of atmosphere. This increase in temperature due to the concentration of the green house gases is known as green house effect. The green house effect is not confined to a particular region but has a global impact. Global warming is the consequence of the green house effect.

## **Major Sources of Green House Gases or Global Warming Gases**

The following gases are mainly responsible for green house effect and global warming –

**1. Carbon-dioxide:** In the natural carbon cycle

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atmospheric carbon dioxide is normally observed by two major sinks. (a) Plant which observe carbon dioxide during the process of photo synthesis and (b) the oceans. But we produce more carbon dioxide at a rate faster than the sinks can absorb it. Therefore, the level of carbon dioxide in atmosphere is increasing day-by-day. The primary source of carbon dioxide is the consumption of fossil fuels like coal, oil, petroleum etc. the secondary source is the oxidation of carbon compound in forest by natural degradation. Manufacture of cement is another factor contributing to increase of carbon dioxide in the atmosphere.

**2. Methane** : Methane is known to trap heat 5 times more effectively than carbon dioxide in the atmosphere. Moreover Methane due to oxidation gives rise to carbon dioxide and water vapour both of which are green house gases.

**3. Chlorofluorocarbons (CFC)** : Concentration of CFC is rising @ 5% per year. It has been estimated that these gases are responsible for 15 – 20% of the Global warming. These gases for also ozone layer depletion. CFC are used in form aerosols, solvents, air conditioners, refrigerators etc.

**4. Water Vapour** : Water vapour is also responsible for producing the green house effect because of the rise in global temperature, transpiration and evaporation increases water vapor concentration in atmosphere. This phenomena reduces more global warming.

**5. Nitrous Oxide (N<sub>2</sub>O)** : N<sub>2</sub>O is 230 times more efficient in global warming than CO<sub>2</sub>. it is also responsible for the destruction of ozone layer. The concentration of N<sub>2</sub>O is rising @ 0.3% per year and is responsible for atleast 6% of the total global warming. N<sub>2</sub>O is produced by burning of forests and grass lands and other bio mass. Other sources of N<sub>2</sub>O are inland water, oceans, natural soil, nitrogenous fertilizers used in agriculture.

### Major Effects of Global Warming on Earth

**1. Acid Rain** : The meaning of acid rain is that there is more acid in rain rather than water. It is surprising to note that all rain falls are slightly acidic, water reacts with atmospheric carbon dioxide to produce carbonic acid (H<sub>2</sub>CO<sub>3</sub>) so pure rain fall has pH of about 5.6. Acid rain is defined as precipitation in which the pH is below 5.6 in that atmosphere. SO<sub>2</sub> and NO<sub>2</sub> are transform by reaction with O<sub>2</sub> and water vapour to form sulphuric and nitric acids. The oxide of sulphur and nitrogen are the main contributors but HCl is also involved in acid rain problem, emitted from coal fired plant. The Acid water has adverse effects on living organism and their reproductions. Acid rain damage not only forests and lakes but also many buildings, building material including steel, plastic, paint, cement, marble etc. The main example is Taj Mahal. So the acid rain environmental global problem.

**2. Ozone Shield Holes** : The presence of ozone layer in the atmosphere is very crucial and significant for plants and animals in general and human being in particular, because it provides a protective cover known as earth umbrella to all of the organism in the biospheric eco system against their exposure to ultra violet solar radiation. In stratosphere there is a layer of ozone which absorb the ultra violet rays of the sun which causes mutations that can develop skin cancer and causes eye cataracts. Ultra violet rays also affect our immune system and also kill off microscopic plants and animals. Depletion of the ozone layer within the stratosphere in recent years is of serious concern. Worldwide depletion of Ozone layer had occur and there was severe depletion of some 40 – 50%

above the Antarctic region every spring. Severe depletions of the ozone layer are known as ozone hole. The causes of ozone depletion due to the release of chlorine atoms which come from the breakdown of chloroflouro carbons. The best CFC is feron a heat transfer agent found in refrigerator and air conditioner.

**3. Rise in Sea Level :** A change in the atmosphere raises the temperature it causes to rise in sea level. Which influence human life and other bioms. There are 3 main causes of rise in sea level.

- i) Rise in earth temperature
- ii) Change in weather cycle
- iii) Ozone Hole

### Global Warming Melts ICE Caps

The sunlight that reach at the earth warms both atmosphere and the earth surface. The earth atmospheric system then radiates the heat as infrared radiation, water vapour and several other gases including carbon dioxide, methane, chloroflouro carbons, warms the earth atmosphere because they absorb and reemit radiation. This is called the green house effect because it is like the glass of a green house that allow sun light to pass through and then traps the resulting heat inside the structure. The air pollutants responsible for the green house effect which are known as the green house gases.

<b>Gas</b>	<b>From</b>
Carbondioxide	Fossil fuel, Wood burning.
Nitrous oxide	Fertilizers used and animal wastes.
Methane	Biogas, (Bacterial decomposition)
Chlorofluoro Carbons	Feron, a Refrigerant
Halons (Halocarbons) CxFxBrx	Fire extinguishers

CO<sub>2</sub> is the principal green house gas responsible for warming the earth. CO<sub>2</sub> allows solar radiations to pass through & strike earth is surface but when it radiates in the form of infrared radiations, CO<sub>2</sub> absorbs them & leads to warming up. Thus CO<sub>2</sub> addition in atmosphere results into rise of temperature.

Some scientists predict the rise in temperature could be as high as 5<sup>0</sup>C by 2050. This rise in temperature would result in melting of the polar ice caps & would add more water to the sea. There would be costal flooding & the possible loss of many cities. If green house effect or the global warming is unchecked, it could alter temperature, rainfall & sea level of the earth. The UNEP (United Nations Environmental Programme) has appropriately chosen the slogan "Global Warming : Global warning" to alert the people on the world environmental day June 5, 1989.

### Impact of Green House Effect

**Impact on Climate :** The increase in concentration of CO<sub>2</sub> & other green house gases in the atmosphere lead to a rise in temperature. It is reported that the concentration of CO<sub>2</sub> will be about 600 ppm by the middle of this century which will increase temperature

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by 1.5 to 4.5°C. Global warming will make the ice melt & the decrease in ice & snow surface will expose more dark surfaces of the earth which would further lead to rise in temperature.

**Impact on Forest:** Forests absorb CO<sub>2</sub> which otherwise would float in the atmosphere adding to the green house effect. An increase of temperature in the atmosphere will affect severely the distribution of tree species. If climate change in rapid conditions may become unsuitable for trees of temperate forests to complete one or more stages of their life cycle. Thus the trees population would lose their ability to complete their life cycle.

### **Impact on Agriculture**

1. Increase in temperature will increase evaporation.
2. Cultivable areas will be enlarged.
3. Soil water will become insufficient because of excessive evaporation & transpiration.
4. Water & soil temperature will rise.
5. Sowing period will shorten.
6. The incidence of insect pests, diseases & weeds will become higher. The activities of microorganisms will increase.
7. The decomposition of organic water & fertilizers will be promoted.
8. The deterioration of soil fertility will be quickened.

### **Impact on Human Beings**

1. Direct effect of Global Warming results in several people being killed by heat stroke or death by drowning. Warmth & rainfall are likely to create more favourable conditions for the insects & viruses, which spread diseases such as malaria, dengue & filariasis
2. Due to the green house effect, there may occur more hurricanes & cyclones & early snow melts in mountains causing more floods during monsoon.

### **What Needs to be Done**

Green House gases can be controlled by taking the following steps :

1. Reducing the emission of the green house gases in the atmosphere.
2. Preparing for adapting to the changing situation in the future.
3. Combustion of fossil fuels is the main cause of increase in the level of CO<sub>2</sub> in air. We have to plan for alternative fuels such as solar energy, Hydrogen or atomic energy, hydroelectricity etc. to reduce the emission of CO<sub>2</sub> in the atmosphere.
4. Deforestation must be checked & efforts should be made to develop new forests by encouraging tree planting programmes; because forests reduce the CO<sub>2</sub> concentration & thereby reduce the green house effect.
5. The emission of nitrous oxide should be reduced by regulating the application of nitrogenous fertilizers biofertilizers.
6. The developed countries should bear the financial responsibility for implementation of such programme, conservation of forests & development of new forests, because the plantation is the best mean to avoid this type of effect.

7. Awareness of global warming & its effects should be given to every one through formal & informal education.
8. There should be drastic cut in the consumption of fossil fuels mainly in the developed & highly industrialized countries.
9. Scientists must discover & develop alternative sources of energy & power & improved better technologies so that maximum energy may be derived from the use of existing fossil fuels & emissions of CO<sub>2</sub> may be minimized.
10. Afforestation & Reforestation on a large scale will certainly reduce the green house effect because forests are big natural sink of CO<sub>2</sub>.
11. The scientists have identified some marine algae (*Phacocystis poucheti*) which to same extent can offset the effect of the global warming.
12. The scientists have also suggested planting of trees like peepal, which act like potential O<sub>2</sub> banks so that more & more CO<sub>2</sub> may be absorbed.
13. Interdisciplinary seminars conferences, group discussions at local & regional level.
14. Environmental management organization, impact assessment & agencies should work effectively & sincerely in solving the problem of environment.
15. Organizing orientation programmes & causes for administrators, executives & the authorities at different level.
16. We should avoid disposable products & try to recycle the waste products to save our environment.
17. We should use Eco-friendly technology.

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