

## GLOBAL WARMING, CLIMATE CHANGES AND REMEDIAL MEASURES

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**Abstract:** The earth's climate is changing constantly. Warming of earth's surface is due to greenhouse effect. It is a natural phenomenon and vital to life. Increases in concentration of greenhouse gases in the atmosphere may lead to problems. The present article is an introduction to the concept of greenhouse gases, global warming and its effect and measures to reduce global warming.

**Keywords:** Atmosphere, Global warming, Greenhouse gases, Greenhouse effect

## INTRODUCTION

A change in the "average weather" of a given area is called climate change and the change in the climate of the earth is global climate change. The earth's climate is changing constantly naturally. Today's climate change differs from the earlier both in its rate and magnitude.

**Effect of Global Warming**

To search an international consensus of scientific opinion on climate change, its impact and possible responses an intergovernmental panel on climate change (IPCC) has been stabilized under United Nations (UN) Environment Programme<sup>1,2</sup>. The first assessment Report (1990) of IPCC, confirmed in second report (1996) concluded that continuous addition of greenhouse gases in the atmosphere would lead to climate change and have important effect on natural and human systems. The recent report of IPCC estimated global average surface temperature.

**Global Warming and Climate Change**

Since 19th century earth's surface temperature have increases 0.6-12°F. This is global warming. The last 15 years have the 10 warmest years of this century. Out of these 2005 was the warmest year after 1850. By the year 2100, the global average surface temperature will increase by 1.0-3.5°C (about 2-6°F).

**Rise in Sea Level**

There is decrease in the snow cover in the North on Hemisphere and floating ice in the Arctic Ocean. Sea level has risen 4-6 inches over the past century on global level.

Rapid global warming could triple the rate of warming in the next century. The Oceans may rise another 8 inches by 2050. This is causing low-lying shorelines to recede significantly. Coastal areas would be lost. The low-lying countries with large coastal population are the most liable to be damaged: Bangladesh, Indonesia, Pakistan, Thailand, Gambia, Maldives, Mozambique, Senegal, Egypt, Surinam and peninsular India.

**Rupture of Water Cycle**

About 1% perception has increase over land. As the climate warms, evaporation will increase which will increase average global precipitation. In many regions soil moisture is to decline and intense rainstorm is to become more frequent that may lead to flooding. More floods contaminate water supplies with pollutants washed from disrupted treatment systems. This gives rise to infectious diseases.

**Health Effects**

Climate change has adverse effect on human health. It is expected to increase in mortality rates due to heat stress as the increase in duration and frequencies of heat waves. People may suffer from heat stroke, heart attacks and other worse effect by the heat. The people may be forced to migrate in hot weather regions as the heat may become unbearable.

Smoke particles and harmful gases could linger in air in hot stagnant condition and accelerate chemical reactions producing other pollutants. These conditions increase the risk of respiratory diseases like bronchitis and asthma.

It is likely that due to climate change infections disease including malaria, dengue covering the range of insects carrying these diseases may be potentially transmitted into the temperate zone including parts of the United States, Europe and Asia. It is estimated that zone of potential malaria transmission may enlarge from an area 45% of the world population to 65% by the end of 21st century. Thus an addition of 50-80 million cases of malaria per year.

Change in natural ecosystem and Forest: A climate change may be strictly harmful to earth's ecosystem. The change may make it difficult few many species to survive in the areas they now in habit. Some may be forced to migrate while others may lose their existence.

Challenges to the food supply and agriculture: Changes in crop yields and productivity are expected in response to climate change in different regions. There may be an extreme scarcity of food particularly in subtropical and tropical semi-arid and arid locations.

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### **Suggested standard to reduce emissions of Greenhouse Gases: Responsible for Global Warming**

It is hard to reduce the emission of greenhouse gases but not impossible. International and Intergovernmental (IPCC) have initiated to reduce the emission of greenhouse gases. These should be legal binding on the emission of six main greenhouse gases (CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, HFCs, PFCs and SF<sub>6</sub>) on the developed countries to an aggregate reduction of 5% on 1990 levels (Kyoto Protocol '97). This need improved high technology and additional cost to control global warming in future the following plan may be accepted.

- (1) Energy efficiency should increase in production and utilization. There is need to change over to low or no carbon fuel. 60% less nitrogen oxide and 40% less hydrocarbons must be emitted by cars.
- (2) To increase fuel efficiency in vehicles and to promote complete combustion in vehicles, clean fuel is needed. Therefore, oil companies will require to develop new fuels. To capture vapour during refueling small box with lid are required on board.
- (3) Change over to non-fossil energy sources viz. solar, hydroelectric nuclear etc.
- (4) Factories must install maximum acceptable control technology so that toxic emission must be reduced to 90%.
- (5) These must be based on the production of CFCs, halons, CCl<sub>4</sub> in refrigeration, air conditioners solvents etc. This will require development of alternative chemicals and recycling of chemicals.
- (6) More use of non fuel vehicles like bicycle, rickshaw has been proposed will less use of private fuel vehicles.
- (7) It is requested to increase afforestation through agro-forestry, social-forestry and decrease deforestation.
- (8) It has been suggested that the global climate can be controlled by plankton living in water surface of world's ocean. It consumes CO<sub>2</sub> through

photosynthesis, thereby avoiding global warming. Research has shown that a growth of plankton by a factor of 20 decreases the dissolved CO<sub>2</sub> level of sea water by 60%.

- (9) Economists have suggested following policy to reduce the emission of global CO<sub>2</sub>.

(a) A transferable discharge permit (TDP):

According to this policy countries would be allotted CO<sub>2</sub> emission permits to their permitted base level emission. This will be determined by any the following measure,

- (1) equi-proportionate reduction in emission
- (2) ability to pay criteria
- (3) polluter pay principle
- (4) equal per capita consumption

(b) Carbon tax: This would be on the carbon content of the fuel consumed. A worldwide reduction of 20% in CO<sub>2</sub> emission would require 45 dollar per ton carbon and further reduction to 50% will require 140 dollar per ton of carbon. This may be troublesome for developing countries.

- (10) In addition to these Programme, the clean development mechanism (CDM) policy has also been proposed (Kyoto Protocol) to reduce the emission of greenhouse gases in the developing countries. Under CDM companies in the developing nations will enter into co-operative projects to reduce emissions of greenhouse gases. Companies or countries can buy less expensive emission permit from countries that have more permit than they need. This emission system imparts trade flexibility to solution of this problem.

- (11) Recently, Paris agreement provides a pathway to limit temperature rise to well below 2°C, may be even 1.5°C by the end of the century. It will serve as an important tool in mobilizes developed countries.

### **REFERENCES**

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