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Global warming and effects on climate

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Abstract
Global warming is one of the most serious global environmental issues. Certain gases like carbon dioxide, nitrogen oxide, methane and chlorofluorocarbons present in atmosphere along with water vapours absorbs the sun's radiation and will not let it escape. Consequently the atmosphere gets warmed up and causes global warming. A very small quantity of chlorofluorocarbons (CFCs) emitted to the atmosphere from leaking refrigerators or some industrial processes have resulted in degradation of the ozone layer. Basic activities like cattle raising and paddy planting also emit methane nitrous oxide and other GHG, s. Very slow, almost imperceptible rise of about 4-5 degree Celsius in the global temperature has occurred in the past 20000 years. A rise of about 0.3 degree Celsius to 0.8 degree Celsius was recorded during the last century alone which is remarkable. Some human activities as energy production and its use, intensive agriculture, maintenance of huge livestocks population, land use modification and industrial production are responsible for global warming. Global sea level could rise by more than 20 feet devastating coastal areas worldwide. A number of people will die from the spread of tropical diseases. Heat waves, droughts and wildfires will be more frequent. Tropical cyclones will likely become more intense, with larger peak wind speeds and more heavy precipitation associated with ongoing increases of tropical sea surface temperatures. The present paper is an attempt to analyze global warming and how it changes our climate and human beings.

Keywords: global warming, climate change, sea level rise, melting glaciers

Introduction
The evidences of global warming seem with beginning of industrial revolution. First coal and then increasing amount of petroleum and natural gas have been burned to power industry, heat and cool cities and drive vehicles. This burning has turned fuels into carbon dioxide and water vapours. At the same time, the world forests have been destroyed due to logging and for agricultural use. With more carbon dioxide and less trees, the level of carbon dioxide has increased. Concentration of extra carbon dioxide makes the atmosphere less transparent to the long wave heat energy radiated back into space from the earth. With other partially man made gases (methane, nitrous oxide and chlorofluorocarbons), the carbon dioxide trap the heat before it can escape and produce greenhouse effect. Global warming is as an increase of the average temperature on earth's atmosphere and oceans, especially a sustained increase sufficient to cause climate change. During the first century of industrial revolution (1780-1880), mean global temperature rose 0.3degree Celsius. They rose another 0.5 degree Celsius in the last half of 1980,s alone. During the late 1980s, earth surface was getting warmer affecting the elements of climatic system. Carbon dioxide is a major contributor to the greenhouse effect and global warming. Concentration of carbon dioxide, methane and nitrous oxide have increased since pre- industrials era by 30 %, 145 % and 15 % respectively because of fossil fuels, land use change and agriculture. A very small quantity of chlorofluorocarbons (CFCs) emitted to the atmosphere from leaking refrigerators or some industrial processes have resulted in degradation of the ozone layer. Basic activities like cattle raising and paddy planting also emit methane nitrous oxide and other GHG, s. Rising world population and over-use of the Earth's resources are damaging both to the natural world and to human communities.

The Intergovernmental Panel on Climate Change concluded that warming of last century and especially of the last few years is unlikely to be due to natural causes and a pattern of climatic response to human activities is found in the climatic record. Countries like USA, China, Russia and India are largely attributed for the growing pollution and the consequent changes in the global climate. The most of the observed increase in global average temperatures since the mid-20th century is the result of human activities that are increasing greenhouse gas (GHG) concentrations in the atmosphere. The pace of climate change is increasing with continued GHG emissions at or above current rates, with globally averaged surface temperatures estimated to rise by 1.8°C to 4.0°C by the end of the 21st century. Global sea level could rise by more than 20 feet and many people will die partly from the spread of tropical diseases. Heat waves, droughts and wildfires will be more frequent. Tropical cyclones will likely become more intense, with larger peak wind speeds and more heavy precipitation associated with ongoing increases of tropical sea surface temperatures.

Consequences of global warming
Global records indicated that a warming of about 0.5 Degree (0.-0.7degree) has occurred in earth's surface temperature during the last century alone. Result suggests that mean global temperature shall rise by 2 degree to 6 degree Celsius during

next century. The transition from the great ice age to present day climate during which average surface temperature rose by 5 degree Celsius almost 12000 years. Some of the considerable consequences of global warming are:

Global climate change
While tropics will expand and world's climatic belts shall shift away from equator while polar areas shall sink Polar regions of the world would undergo large increase in temperature, about ten to twelve as much as tropics. North America, Europe, parts of Russia and fertile cold belt of USA will become drier and peninsular India, and some of Central Africa shall become more humid (Parks, 2009).

Change in precipitation
Global warming would bring change in precipitation pattern. Shift in weather conditions might increase the aridity of some of world dry areas such as Africa's Sahel and increase rainfall in some already wet areas. Continental interiors of mid latitudes would receive less precipitation and suffer from droughts. Precipitation might decline by 40 % in the US corn and wheat belt resulting reduce in agricultural productivity.

Drastic change in bio diversity
Of over 1,400 species analyzed, ranging from fish and mammals to grasses and trees, over 80% are migrating to higher latitudes or higher elevations due to global warming. This could cause disruptive ecological and economic changes, such as the disappearance of entire fisheries. Amphibians has shown particular vulnerability. During the last century, the planet has lost 50 % of wetlands, 40 % of forest and 35 % of mangroves. Around 60 % of global ecosystem services have been degraded in just 50 years (World Bank, 2013). In mountains, many species, including the golden toad and most of the species of frogs, have vanished or declined because of diseases spurred by climatic changes (Asthana, 2013) [2]. More than a million species worldwide could be extinct by 2050.

Increase of insects and change in disease pattern
Insects and pests and pathogens may increase due to higher temperatures. Higher temperatures can also lengthen the season during which mosquitoes are active. New unforeseen diseases of plants, animals and man shall appear and could acquire the dimensions of an epidemic (Rao, 2000) [7]. Under the changing climatic conditions, these organisms could inflict heavy damage on human health.

Rise in sea level
Low lying areas of world areas shall be submerged. Evidences show that mean sea level was 100 meter lower than the present day level about 12000 years back. Estimates show that an increase of 4 to 5 degree Celsius could raise the mean sea level 5 to 6 cms. During the20th century, sea levels around the world rose by an average of 4 to 8 inches (10 to20 cm). If all ice present on earth crust was to melt, sea level could rise by about 60 meters' Sea level is projected to rise between 9 cm and 29 cms by 2030 and 96 cm by 2090.Even one meter rise would be enough to cover Maldives and other low lying islands. The Nile delta would be flooded and impacts on the people of Bangladesh would be catastrophic.

Snow melting and retreating glaciers
Mountain snowcap constitutes a critical reservoir of fresh water. In mountainous region across the world, glaciers are retreating in response to the warming climate. The shrinkage of glaciers is already created water shortages. In one basin in Glacier National Park in Montana, Two-thirds of the ice has disappeared since 1850. With uncontrolled warming, the remaining glaciers could disappear by 2030. In the European Alps, ice melted for the first time in 5,000 years. In Asia, glaciers are retreating at a record pace in the Indian Himalaya.

Killer heat waves
Heat waves are extremes of high temperature that is above the normal temperature. With increasing temperature due to chlorofluorocarbons gases, the heat waves are increasing. Two or three heat waves are experienced in India during the summer. Widespread heat waves cover about 10 percent of Indian landmass especially in north -west India and extend towards east. Human-caused global warming may have increased the chance of killer" heat waves more.1998, 3,028 people died in the most disastrous heat wave to ever hit India.

Greenhouse Effect
Greenhouse effect is contributing to global warming. A large faction of the much longer-wavelength infrared radiation emitted by the cooler Earth is absorbed by the Earth's atmosphere. Thus a part of the Sun's radiant energy that impinges on the Earth's surface is trapped by our atmosphere. If the amount of incoming solar radiation that is absorbed and trapped exceeds the amount that is reflected and reradiated into space, there is an imbalance and the Earth's temperature will begin to rise. Global surface temperature increased about 0.6 degree Celsius per century since the 19th century and increased to 2 degree Celsius over the past 25 years.

Damage to coral reefs
Around the world, the incidence of large-scale coral bleaching events has increased since 1979, and is linked with global warming. The normally brilliant colors of corals are provided by photosynthetic algae, called zooxanthellae, which live inside the corals. When the surrounding water temperature rises at least 1 degree Celsius, zooxanthellae results the loss of color that gives rise to the term bleaching. Prolonged bleaching often leads to death of the coral (Gautam, 2016) [3]. Average surface ocean temperatures in many tropical regions rose by almost2°F (1°C) over the past century and created a threat to coral reefs.

Ultra violet exposure
Due to rise in earth temperature, there will be more exposure to ultra violet rays that would cause skin cancer, premature aging cataract and other eye damage, and suppression of immunity.

Suggestions
1. Reduce the contribution of greenhouse gases: Methane, carbon dioxide and chlorofluorocarbons are the gases that increase the eart h's temperature. Their emission should be reduced.
2. Reduce, Reuse and Recycle: Reduce waste by choosing

reusable products instead of disposables. Buying products with minimal packaging will help to reduce waste. By recycling half of your household waste, you can save 2,400 pounds of carbon dioxide annually.

3. Buy Energy-Efficient Products: To buy a new car, choose one that offers good gas mileage. Home appliances should be energy efficient models, and compact florescent bulbs are designed using far less energy than standard light bulbs.
4. Plant more trees: During photosynthesis, trees and other plants absorb carbon dioxide and give off oxygen. They are an integral part of the natural atmospheric exchange cycle here on Earth. A single tree will absorb approximately one ton of carbon dioxide during its lifetime
5. Efficient law enforcement: There should be ban on factories that transmit more carbon dioxide than a prescribed limit and their licenses should be cancelled.
6. Awareness among people: People should be made aware about the effects of global warming through media educational institutions and NGO's.
7. Reduce use of plastic burning: Burning of plastic emits CH4 and cause an increase in global warming. So, plastic burning should be stopped.
8. Setting standards for effluents to be discharged in the environment.

Conclusion

Global warming is caused by the greenhouse effect which is a result of natural gases and human activities. The significant increase in earth's temperature is causing many disastrous events such as floods, droughts, tsunami and submergence of coastal areas. In the famous Rio de Janerio Earth Summit in1992, strategies were framed to reduce greenhouse gas emission; still the situation is very alarming today. There is a need to reduce the global warming by using less gasoline, recycle the products. Reforestation and greater reliance on renewable sources of energy is the need of hour. If we don't reduce global warming, our next generations will suffer. The role of local self-governments, youths and social responsibility of corporate sectors may play an important role in fighting with global warming.

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