Climate Change: Causes and Effects

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**Introduction:** At present time climate change throughout the world has made the people of both learned and general thinkable about the far reaching harmful effects which might cause the extinction of humans from many parts of the world. According to IPCC “Scientific evidence for warming of the climate system is unequivocal.” Because of the change of Earth’s climate just in the last 650,000 years there happened seven cycles of glacial advance and retreat which included the last ice age happened 11,700 years ago and began the modern climate age and human civilization. During this time the changes of climate had attributed a small variation in the Earth’s orbit that changed the amount of solar energy our planet received. But the current warming trend of the globe is noticed since the mid-20th century due mainly to the causes of human activity which is proceeding at an unprecedented rate over decades to millennia. Due to the human activity greenhouse gases such as carbon dioxide, nitrous oxide, methane, and water vapor are emitted in the air which is responsible for trapping of heat in the air and causes global warming and climate change. The heat –trapping of the greenhouses gases was demonstrated in the mid -19th century. Besides, it is noticed that ice cores drawn from Greenland, Antarctica and tropical mountain glaciers show that the climate of the Earth responses to the changes of the greenhouse gas levels. Again ancient evidences are also found in the tree rings, ocean sediments, coral reefs and layers of sedimentary rocks which reveal that current warming of the globe is occurring ten times faster than the average rate of ice-age-recovery warming. It is believed that current emissions of carbon dioxide from human activity are increasing 250 times faster than it did from the natural sources after the last Ice Age.

**What is Climate Change**?

Climate change means the statistical distribution of weather pattern for a certain period of time such as decades to millions of years. It also refers to a change in weather condition. It refers to an increase in mean annual surface temperature of the earth’s atmosphere due to increase in atmospheric concentrations of greenhouse gases. The climate change, thus ,is defined as variations and shift in weather conditions over space and time of different and magnitude resulting into change of climatic type for example, from warm and moist climate to warm and dry climate, from warm and moist climate to cool and moist climate etc.( Singh, Savindra 2005 ).

**Causes of Climate Change:**

Scientists opine that the main cause of climate change is the emission of greenhouse gases such as carbon dioxide, carbon-monoxide, methane, nitrous-oxide, water-vapor etc. Short description of the greenhouse gases are as follows:-

Carbon dioxide is a minor but important component of the atmosphere is released through many natural processes such as respiration, volcanic eruptions, human activities such as deforestation land use changes and burning of fossil fuels. It absorbs heat. It can be noted that humans have increased 47% CO2 concentration since the industrial revolution began. This is the most important factor of climate change.

Methane: It is a more active greenhouse gas than carbon dioxide but it is less abundant in the atmosphere. This gas is produced both through natural sources and human activities such as decomposition of wastes in landfills, agriculture and rice cultivation. It is also produced from ruminant digestion and manure management associated with domestic livestock.

Nitrous oxide: Another greenhouse gas which is very powerful and produced from soil cultivation practices, commercial and organic fertilizers, fossil fuel combustion, nitric acid production, and biomass burning. This gas is also responsible for climate change.

Chlorofluorocarbons (CFCs): This gas is produced from entirely industrial products such as refrigerators, air conditioners etc. This greenhouse gas also causes climate change.

Water vapor: It acts as a feedback to the climate. This gas is found abundantly in the atmosphere when the Earth’s atmospheres warms and causes precipitations.

**Effects of Climate Change:**

The scientists of the Intergovernmental Panel on Climate Change (IPCC) set up by the World Meteorological Organization (WMO) and United Nations Environment have reached in a conclusion that there is more than 95 percent probability that human activities over the last 50 years have warmed our planet causing climate change. The industrial activities done by our modern civilization have raised atmospheric carbon dioxide level from 280 parts per million to 414 parts per million in the last 150 years thus contribute in the change of climate throughout the world. Following are the effects of climate change.

1) Climate change will warm the Earth on average and as a consequence some regions of the Earth may have warmer temperatures while the other regions may not have.

2) Due to climate change warmer condition of the Earth will probably cause more evaporation and precipitation overall but this situation may vary in case of individual regions where some becomes wetter and others drier.

3) Due to climate change caused by greenhouse effect, the ocean water will warm, glaciers and ice sheet of the continents will melt partially thus increase sea level rise.

4) The presence of higher level carbon dioxide in the atmosphere may put both positive and negative impacts on crop yields. Laboratory experiments suggest that elevated levels of carbon dioxide in the atmosphere can increase plant growth.

5) Droughts, floods, cyclones and extreme temperatures are the results of climate change which can lead crop losses and threaten the livelihoods of the crop producers thus ultimately threaten the food security of the world communities. Besides, weeds, pests, fungi which are depended on the crops and ecosystems may also face the consequence of extinction while increased carbon dioxide level and climate change may increase weeds and pests.

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