Climate Change

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According to National Aeronautics and Space Administration (NASA) climate change is a range of global phenomena triggered primarily by fossil fuels consumption, which add Greenhouse gases (GHGs) to atmosphere. These phenomena include the temperature rise termed as global warming, rise the sea level and loss of ice mass in the glacial inventories.

Discussion

Climate change is the comprehensive term used for the transformation of global weather patterns that are linked with the worldwide rise of mean temperature. The rise in temperature is the worldwide truth from many decades. The authentic records of temperature from 1850 show that the temperature of the earth are one degree higher than from 1850 to 1900, this is often called the pre-industrial mean temperature. During 1961 to 2017 the change is more pronounced and in lesser time span the mean value was 0.68 degree warmer. It is alarming to note that the average temperature of earth's surface has risen by 0.6˚C since the late 1800s and is expected to increase by another 1.5 to 5.8˚C by the year 2100. If the minimum predicated increase takes place, it will be larger than any century. The sea level has risen on an average by 10 to 20 cm and it is expected that it will further rise by 9 to 88 cm by the year 2100. The Third Assessment Report (TAR) of the Inter-Governmental Panel on Climate Change (IPCC) published in 2001 stated that there is new and stronger evidence that the most of the warming over the last 50 years is solely due to human activities.

This temperature rise is commonly called global warming, presently scientists recommend the term climate change, which stated not only rising mean temperature of the earth but also includes the events and processes as results of this rising temperature. Climate change has

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intricate connection with global warming, ozone depletion and sea level rise.

World is presently focused on controlling and mitigating temperature below two degree Celsius which was the mean temperature of the pre-industrial period. There are worldwide efforts to control the rise ideally not more than 1.5 degrees. The ideal goal may be achieved if humans pay collective efforts internationally. By keeping in view the climatic conditions all around the world most of the nation states have joined the United Nations Framework Convention on climate change (UNFCCC) in order to reduce global warming.

Implications

The effects of climate change, accelerated by anthropogenic activities, may start with repeated droughts to snowstorms, and freezing winter spells in temperate world. The climate change is not only creating the effects on humans but also on other species of ecosystem of the planet. For example, rising ocean temperature is the cause of reduction in coral reef; temperature rise accelerates the dry weather conditions which means wildfire increases and regaining of forest and wildlife is no longer save in all over the world. The planet earth is no longer supportive for animal vitality.

Climate change also affects the economic systems because the raw material is directly linked with nature, while the socio-political systems are also affected by climate change. Previous studies show that food security is greatly affected by climate change in African countries and is one of the major causes for military conflicts for food and shelter availability.

The World is previously facing climate refugees after the increasing sea level due to melting Arctic permafrost and other high frequency weather events.

Causes

Anthropocene is the major case. Although natural phenomena are extremely damaging the climate but scientists acknowledge that global warming and the consequences of climate effects that we are

experiencing, are the outcomes of human activities and overexploitation of natural resources.

The scientific and technological revolution has given multiple facilities to mankind but at the same time man-made (anthropogenic) activities are responsible for the depletion of resources and upsetting the delicate balance between the various components of the environment. There are excessive use of fossil fuels, deforestation, desertification, loss of fertility of soil, rapid industrialization, and an increase of automobiles. Changes in the atmospheric conditions result in serious problems like Greenhouse gasses which accelerate climate change. Glaciers are necessary for planet's health. Glaciers have been on retreats for more than 100 years with very few exceptions in the upper Karakorum (termed as Karakoram Anomaly). In global climate system, they are called unique indicators of climate change. Climate change in the Antarctic Peninsular region is recorded at the rate that is approximately six times of the global average rise. The atmospheric temperature has increased by 2.5˚C between 1950 and 2000, and rapid warming is recorded since 1930. The annual mean air temperature -9˚C isotherms have moved to south leading ice-shelf sinking and glacial ice loss in the sea.

The total radioactive forcing of the earth climate due to increase in the concentration of the GHGs, CO2, CH4, and N4O and very likely the rate increases in the total forcing due to these gasses over the period since 1750, are un-precedes in more than 10,000 years.

The greenhouse effect of the atmosphere is the major reason for life on planet earth. The water vapours in the lower atmosphere trap heat from the sun and reflect back to the atmosphere. The long-wave radiation by the surface keeps planet at a temperature favourable for supporting life. But presently our activities are producing these gasses in excess which is the major cause of increasing temperature of the atmosphere and the mean temperature of the earth surface and this process is continuous.

The greenhouse gasses gases (GHGs) mainly include carbon dioxide, methane and oxides of nitrous. Carbon dioxide is well known due to involvement in natural processes including decomposition and animal respiration. The main source of carbon dioxide emission is the

fossil fuel burn while deforestation has decreased the number of plants in the ecosystem that convert carbon dioxide into oxygen. Natural gasses in various industrial and transport system have resulted in a steady increase of carbon dioxide gas in the atmosphere. The increase has been nearly 25% since 1850.

Methane (CH4) is a strong but less found greenhouse gas which is emitted into the atmosphere from livestock farming. Cattle and arable farming methods including traditional rice paddies also contribute methane into the atmosphere. Methane in the air has been increased from 750 ppb in 1750 A.D. to 1750 ppb in 2000. The global temperature rise due to methane rise is eleven times higher than that of CO2.

Chlorofluorocarbons (CFCs) and hydrofluorocarbons are used in industry and in home appliances such as refrigerators. These are also important greenhouse gasses released during the post-industrialized world. These gases have negative impact on the atmosphere, which include ozone depletion with heating trapping effect in the lower part of atmosphere. Modern world is using Chloroflurocarbons (CFCs) quite frequently. These are used in foams about 26 percent aerosols 25 percent solvents 19 percent air conditioners 12 percent refrigerants 8 percent and others 10 percent. Global warming potentiality of CFCs is very high (1600 to 1500) times as compared to CO2. The concentration of CFCs in the atmosphere is less than 1ppm, though it is increasing at the rate of 5 percent per year. World over, efforts are being made to reduce the CFCs production but more than 15 million tones have already been released in the atmosphere by 1985.

Nitrous oxides is a quite stable gas with dual damaging effects. It is not only a greenhouse gas but also an ozone destroyer. The common sources of N2O production are natural soil, inland water, oceans, fertilizers and burning of forests, grasslands and other biomass. The global warming potentiality of N2O is 270 times higher than of CO2. The concentration of N2O increased from 270 ppb preindustrial time 1750 to 315 ppb in the year 2000. Ozone CCL4, CH3, CCL3 and HCFC are other greenhouse gasses.

Anthropogenic activities of warming climate of the world is also building a negative feedback loop as greenhouse gasses trapped in Arctic permafrost are released into the atmosphere.

Climate Change Denial

The multinationals are investing in the publicity of the story that fossil fuels have not bad impact on climate. For this purpose, they invest on advertisement of their point of view through media. But studies show that fossil fuels are a major cause of climate change.

The dispute among climate scientists and oil companies is covered by the media, but even such as Chevron Cooperation Oil Industry now publicly accept that the fossil fuel consumption has played a major role in deteriorating the quality of our climate.

Climate Change in Future

- Global warming will have larger effects on climate change. Firstly it is predicted that by 2030, CO2 concentration will reach about 600 ppm 0.06 percent and average global temperature will rise by 1.5 -4,5 ˚C. Temperature rise will be more evident in higher latitudes.
- Secondly, global warming will affect rainfall patterns. And relocate the rainfall patterns.
- Thirdly the sea level would rise by 20-140 cm in various parts due to global warming and glacier melting. And evapotranspiration will stress water.

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