Climate Change and Its Causes and Effects: A Review

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***Abstract:* - Climate change may refer to a change in average weather conditions, or in the time variation of weather around longer-term average conditions (i.e., more or fewer extreme weather events). Climate change, also called global warming, refers to the rise in average surface temperatures on Earth. An overwhelming scientific consensus maintains that climate change is due primarily to the human use of fossil fuels, which releases carbon dioxide and other greenhouse gases into the air. Climate change scenarios include higher temperatures, changes in precipitation, and higher atmospheric CO2 concentrations. In this paper we studied about Climate Change and It's Causes and Effects.**

***Keywords*: - Climate Change, Global Warming**

I. INTRODUCTION

Climate change is real, and it is really something serious that people downplay a whole lot. The problem is that most people don't really understand what it really is, and what causes it. The truth is, the climate is changing each and every day. The term sometimes is used to refer specifically to climate change caused by human activity, as opposed to changes in climate that may have resulted as part of Earth's natural processes. Factors that can shape climate are called climate forcings or "forcing mechanisms". These include processes such as variations in solar radiation, variations in the Earth's orbit, variations in the albedo or reflectivity of the continents and oceans, mountain-building and continental drift and changes in greenhouse gas concentrations. There are a variety of climate change feedbacks that can either amplify or diminish the initial forcing. According to the report by department of ecology, State of Washington, Preparing for a Changing Climate, rising levels of carbon dioxide and other heat-trapping gases in the atmosphere have warmed the Earth and are causing wide-ranging impacts, including rising sea levels; melting snow and ice; more extreme heat events, fires and drought; and more extreme storms, rainfall and floods. Scientists project that these trends will continue and in some cases accelerate, posing significant risks to human health, our forests, agriculture, freshwater supplies, coastlines, and other natural resources that are vital to Washington state's economy, environment, and our quality of life.

Global Warming: Global Warming is the increase of Earth's average surface temperature due to effect of greenhouse gases, such as carbon dioxide emissions from burning fossil fuels or from deforestation, which trap heat that would otherwise escape from Earth. This is a type of greenhouse effect. Glaciers are melting, sea levels are rising, cloud forests are dying, and wildlife is scrambling to keep pace. It's becoming clear that humans have caused most of the past century's warming by releasing heat-trapping gases as we power our modern lives. Called greenhouse gases, their levels are higher now than in the last 650,000 years. Global warming is the gradual heating of Earth's surface, oceans and atmosphere. Scientists have documented the rise in average temperatures worldwide since the late 1800s. Earth's average temperature has risen by 1.4 degrees Fahrenheit (0.8 degrees Celsius) over the past century, according to the Environmental Protection Agency (EPA). Temperatures are projected to rise another 2 to 11.5 degrees F (1.133 to 6.42 degrees C) over the next 100 years.

II. CAUSE OF CLIMATE CHANGE

There are mainly two types of causes

A. Natural causes

B. Human causes

Natural causes

A. Volcanic eruptions: A volcanic eruption occurs when molten rock, ash and steam pour through a vent in the earth's crust. The eruptions considered to be large enough to affect the Earth's climate on a scale of more than 1 year are the ones that inject over 100,000 tons of SO2 into the stratosphere.

B. Ocean current: The oceans are a major component of the climate system. An ocean current is a continuous movement of ocean water from one place to another. Ocean currents are created by wind, water temperature, salt content, and the gravity of the moon. Another region that is strongly influenced by ocean currents is the North Atlantic. If we compare places at the same latitude in Europe and North America the effect is immediately obvious.

C. Continental drift:- Gradual change in the direction of the earth's axis, called precession is responsible for changes in the climate.

D. Solar variations: The Sun is the source of energy for the Earth's climate system. Although the Sun's energy output appears constant from an everyday point of view, small changes over an extended period of time can lead to climate changes. The Sun is the predominant source of energy input to the Earth. Other sources include geothermal energy from the Earth's core, and heat from the decay of radioactive compounds. Both long- and short-term variations in solar intensity are known to affect global climate.

Human Causes

A. Greenhouse gases: Many of these gases occur naturally, but human activity is increasing the concentrations of some of them in the atmosphere, in particular carbon dioxide (CO_2), methane, nitrous oxide, fluorinated gases. greenhouse gases include water vapor, CO_2, methane, nitrous oxide (N_2O) and other gases, according to the Environmental Protection Agency (EPA). The last time Earth's atmospheric levels of CO_2 reached 400 ppm was during the Pliocene Epoch, between 5 million and 3 million years ago, according to the University of California, San Diego's Scripps Institution of Oceanography.

B. Electricity is the main source of power in urban areas. All our gadgets run on electricity generated mainly from thermal power plants. These thermal power plants are run on fossil fuels (mostly coal) and are responsible for the emission of huge amounts of greenhouse gases and other pollutants. Cars, buses, and trucks are the principal ways by which goods and people are transported in most of our cities. These are run mainly on petrol or diesel, both fossil fuels.

C. CFCs, or chlorofluorocarbons, which are basically synthetic compounds that are created in the industrial setting, also play a part. They are usually what plays a part in the depletion of the ozone layer. The more the ozone layer is depleted, the hotter our earth will get.

III. EFFECTS OF CLIMATE CHANGE

One of the most serious impacts of climate change is how it will affect water resources around the world. Water is intimately tied to other resource and social issues such as food supply, health, industry, transportation and ecosystem integrity. Changes in the climate will change the weather patterns and will bring more rain in some countries, but others will have less rain, generally dry areas will become drier and wet areas could become wetter. Increasing temperatures caused by climate change will make the water of the oceans expand; ice melting in the Antarctic and Greenland will also contribute to the sea level. The temperatures of large lakes world-wide have risen dramatically. Temperature rises have increased algal blooms in lakes, favor invasive species, increase stratification in lakes and lower lake levels. As temperatures warm, species may either move to a cooler habitat or die. Species that are particularly vulnerable include endangered species, coral reefs, and polar animals. Warming has also caused changes in the timing of spring events and the length of the growing season.

The Indus and Brahmaputra are expected to see increased flows in spring when the snows melt, with flows reducing subsequently in late spring and summer. Floods (because of man made reasons , urbanization etc. affect the climate) can lead to destruction of roads, railways and many other infrastructure. Its renovation prices are in billions. So, direct impact on GDP and account from any natural hazard. And life loss is also there. It also lead to short term inflation because of shortage of food. Due to climate change, many tourism places are also affected. E.g. Cloudburst in Uttrakhand. Changing colour of Taj Mahal etc. The IPCC is a body of 2500 scientists that brings out reports, considered the last word on the Science of Climate Change. "Warming of the Climate System is unequivocal", says the IPCC in its latest report, pointing to the increased global, air and ocean temperatures, widespread melting of snow, and ice and rising sea levels. Increase in CO_2 to 550 ppm increases yields of rice, wheat, legumes and oilseeds by 10 to 20 percent. A 1oC increase in temperature may reduce yields of wheat, soybeans, mustards, groundnuts, and potatoes by 3 to 7 percent. There would be higher losses at higher temperatures. Productivity of most crops decreases only marginally by 2020 but by 10 to 40 percent by 2100 due to increases in temperature, rainfall variability, and decreases in irrigation water.

IV. CONCLUSION

Climate change is a change in the statistical distribution of weather patterns when that change lasts for an extended period of time (i.e., decades to millions of years). Even small increases in Earth's temperature caused by climate change can have severe effects. The earth's average temperature has gone up 1.4° F over the past century and is expected to rise as much as 11.5° F over the next. That might not seem like a lot, but the average temperature during the last Ice Age was about 4º F lower than it is today. Above we see that how climate change

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