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CLIMATE CHANGE AND GLOBAL WARMING : A GEOGRAPHICAL STUDY- A REVIEW

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ABSTRACT:
The climate is long term and average condition of the Earth's atmosphere regarding atmospheric elements. The climatic elements like as temperature, precipitation, humidity etc. The type of climate we experience now might be prevailing over the last 10,000 years with minor and occasionally wide fluctuations. The planet earth has witnessed many variations in climate since the beginning. The rings in the trees provide clues about wet and dry periods. Historical records describe the vagaries in climate. All these evidences indicate that change in climate is a natural and continuous process. India also witnessed alternate wet and dry periods. Earth's climate has been changed lot of times. According to experts major cause of climate change is global warming. Global warming has adverse effects on the agriculture, biodiversity, human health, forests and so on. After the 1950, the issue of global warming is rise up. Green House Effect is the major cause of global warming and GHG_s like CO_2, CH_4, NOx, etc. are responsible for it. The human activities like industrialization, deforestation, urbanization, transportation etc.. are intensifying it. Let us hope the world community responds to this challenge and adopts a lifestyle that leaves behind livable world for the generations to come.

Keywords:- Climate Change, Carbon sinks, Global warming, Ozone Depletion, Coral Bleaching.

INTRODUCTION:

The gaseous envelope around the earth permits a considerable portion of solar radiation to enter right up to the surface of earth. Some of its absorbed by the earth's surface, while remaining radiates back. The gaseous envelope allow sunlight(short waves) radiation to reach the earth, but when light radiates in the form of long waves (infrared) radiation, its absorbed by GHG's and causes warming up. These heat is transfer to layer above, as warm layer rises and in turn passes on to higher and higher layer (S.P. Misra, *et.al, year2008).*

Causes of Climate Change

The causes for climate change are many. They can be grouped into astronomical and terrestrial causes. The astronomical causes are the changes in solar output associated with sunspot activities. **Sunspots** are dark and cooler patches on the sun which increase and decrease in a cyclical manner. According to some meteorologists, when the number of sunspots increase, cooler and wetter weather and greater storminess occur. A decrease in sunspot numbers is associated with warm and drier conditions. **Volcanism** is considered as another cause for climate change. Volcanic eruption throws up lots of aerosols into the atmosphere. These aerosols remain in the atmosphere for a considerable period of time reducing the sun's radiation reaching the Earth's surface.

Eg: Volcanic eruption on 19 feb. 2018. A vast column of ash and debris shot thousands of feet into the sky in a major volcanic eruption on the Indonesian island of Sumatra.

Global warming is the current increase in temperature of the Earth's surface (both land and water) as well as it's atmosphere. Average temperatures around the world have risen by 0.75°C (1.4°F) over the last 100 years. The most important anthropogenic effect on the climate is the increasing trend in the concentration of greenhouse gases in the atmosphere which is likely to cause global warming. closed, you feel more heat than outside. Likewise during winter the vehicles with closed doors and windows remain warmer than the temperature outside. This is another example of the greenhouse effect.

Greenhouse Gases(GHGs) The primary GHGs of concern today are carbon dioxide (CO2), Chlorofluorocarbons (CFCs), methane (CH4), nitrous oxide (N2O) and ozone (O3). Some other gases such as nitric oxide (NO) and carbon monoxide (CO) easily react with GHGs and affect their concentration in the atmosphere. The effectiveness of any given GHG molecule will depend on the magnitude of the increase in its concentration, its life time in the atmosphere and the wavelength of radiation that it absorbs. The chlorofluorocarbons (CFCs) are highly effective. *Ozone* which absorbs ultra violet radiation in the stratosphere is very effective in absorbing terrestrial radiation when it is present in the lower troposphere. The *largest concentration* of GHGs in the atmosphere is *carbon dioxide*.

The emission of CO2 comes mainly from fossil fuel combustion (oil, gas and coal). Forests and oceans are the sinks for the carbon dioxide. Forests use CO2 in their growth. So, deforestation due to changes in land use, also increases the concentration of Co2. The time taken for atmospheric CO2 to adjust to changes

in sources to sinks is 20-50 years. It is rising at about 0.5 per cent annually. Chlorofluorocarbons (CFCs) are products of human activity. *Ozone* occurs in the stratosphere where ultra-violet rays convert oxygen into ozone. Thus, ultra violet rays do not reach the earth's surface. The CFCs which drift into the stratosphere destroy the ozone. Large depletion of ozone occurs over Antarctica. *The* depletion *of ozone concentration in the* stratosphere is called the *ozone hole*. This allows the ultra violet rays to pass through the troposphere. International efforts have been initiated for reducing the emission of GHGs into the atmosphere. The most important one is the *Kyoto protocol* proclaimed in 1997. This protocol went into effect in 2005, ratified by 141 nations. Kyoto protocol bounds the 35 industrialized countries to reduce their emissions by the year 2012 to 5 per cent less than the levels prevalent in the year 1990. The increasing trend in the concentration of GHGs in the atmosphere may, in the longrun, warm up the earth. Once the global warming sets in, it will be difficult to reverse it. The effect of global warming may not be uniform everywhere. Nevertheless, the adverse effect due to global warming will adversely affect the life supporting system. Rise in the sea level due to melting of glaciers and ice-caps and thermal expansion of the sea may inundate large parts of the coastal area and islands, leading to social problems. This is another cause for serious concern for the world community. Efforts have already been initiated to control the emission of GHGs and to arrest the trend towards global warming.

A) CAUSES OF GLOBAL WARMING

1) BURNING of FOSSIL FUELS

When we burn fossil fuels like coal, oil and gas to create electricity or power our cars, we release CO_2pollution into the atmosphere.

2) DEFORESTATION

Plants play an important role in regulating the climate because they absorb carbon dioxide from the air and release oxygen back into it. Forests and bushland act as **carbon sinks** and are a valuable means of keeping global warming to 1.5°C.But humans clear vast areas of vegetation around the world for farming, urban and infrastructure development or to sell tree products like timber and palm oil. When vegetation is removed or burnt, the stored carbon is released back into the atmosphere as CO_2, contributing to global warming. Up to one-fifth of global greenhouse gas pollution comes from deforestation and forest degradation. Preventing deforestation as well as planting trees, through reforestation and afforestation, are important actions in the fight against global warming.

3) FARMING

Animals, particularly livestock like sheep and cattle, produce methane, a greenhouse gas. When livestock are grassed at a large scale, as in Australia, the amount of methane produced is a big contributor to global warming. Some fertilisers that farmers use also release nitrous oxide, which is another greenhouse gas.

Other Causes

- **Nitrous oxide**. A powerful greenhouse gas produced by soil cultivation practices, especially the use of commercial and organic fertilizers, fossil fuel combustion, nitric acid production, and biomass burning. Nitrous oxide has an atmospheric lifetime of 110 years. The process that removes nitrous oxide from the atmosphere also depletes ozone. So nitrous oxide is not only a greenhouse gas, but also an ozone destroyer.
- **Chlorofluorocarbons (CFCs)**. Synthetic compounds entirely of industrial origin used in a number of applications, but now largely regulated in production and release to the atmosphere by international agreement for their ability to contribute to destruction of the ozone layer. They are also greenhouse gases.
- **Hydro fluorocarbons** Releases of HFCs do not cause damage at a local level. They do however have a global environmental effect, as greenhouse gases contributing to global warming. Although their "global warming potential" is high (100-3000 times that of carbon dioxide), the relatively small amounts involved mean that they play a small role compared to other greenhouse gases. HFCs can persist in the environment for up to hundreds of years because of their high stability.

B) EFFECTS OF GLOBAL WARMING

1. Melting of Glaciers: The melting of glaciers will create many problems for human kind and the animals living on the earth. Due to increased global warming, the level of the sea will rise which will lead to flooding and this will in turn create havoc in human life. Apart from raising the sea levels, it will also **endanger several species** of animals and thus will hamper the balance of the ecosystem. Areas in the Arctic are

diminishing away and flowing into major oceans. Rising temperatures create a much accelerated threat to wildlife and whole ecosystems in these regions.

2. Climate Change: Irregular weather patterns have already started showing results. Increased precipitation in the form of rain has already been noticed. More global warming will lead to more evaporation which will cause more rains. Animals and plants cannot easily adapt to increased rainfall. Plants may die and animals may migrate to other areas, which can cause entire ecosystem out of balance.

3. Droughts: Large scale evaporation will be the major cause of droughts in many places particularly Africa. Although, it is reeling under the huge pressure of water crisis, increased global warming would further make the situation worse and will cause malnutrition.

4. Diseases: As the temperature becomes warmer, it can affect the health of humans and the diseases they are exposed to. With the increase in the rainfall, water borne diseases are likely to spread like malaria.

5. Tropical Cyclones and Hurricanes Frequency increasing: As the temperature of the oceans rises, hurricanes and other storms are likely to become stronger. With the increase in the global warming, the water in the ocean warms up and it heats up the surrounding air, creating cyclones.

6. Rise of Sea Levels: The melting of polar ice-caps and less water evaporating into the atmosphere are causing increased sea levels

7. Agriculture: Global warming can affect agriculture. Although the results are not visible yet, but it may show its effects in years to come. As the global temperature will increase, plants will find it harder to survive and will die.

8. Heat Waves: Heat waves cause dangerously hot weather and in recent years, more deaths have occurred due to heat waves than in the last sixty years.

9. Frequent Wildfires: While wildfires are a natural occurrence, with the added carbon dioxide in the air, and hotter summers, the evidence speaks for itself. More frequent wildfires continue to surface in vast amounts each year.

10. Severe Precipitation: Not only is there insurmountable scientific evidence that global warming is increasing, certain types of events, including extreme precipitation is on the rise. Global warming also creates conditions that can lead to more powerful hurricanes and summer storms.

11. Crops: Global warming not only has its negative effects on animals and man but it can even leave an adverse effect on the crop production. The sudden changes in temperature such as the average temperature rising in majority of the seasons affects the amount of rainfall. This can seriously damage the growing of crops. Because of the higher temperatures the seasons are becoming unstable. There is decreased snow fall and increased rain as more and more evaporates because of intense heat in many regions. There is less amount of snow fall in the colder regions and the climatic changes have given birth to new bacterial diseases that are damaging the crops.

12 Oceans: It's reported that coral reefs are continuing to see diminished presence in the ocean due to global warming. Temperature changes affect more than what's happening on our lands. Once coral reefs are affected, entire ecosystems that thrive become obsolete.

13. Health Risks: As more carbon dioxide is trapped in the atmosphere, breathable air becomes harder to come by.

14. Animal Extinction: Nature's best is beautifully displayed in every nook of planet earth-the majestic lion, to the humble deer. Imagine whole populations where animals can no longer thrive. With such a vast eruption in the animal kingdom, our own world becomes in danger.

15. Economic Collapse: Who knows how badly the economy could get with decreased vitality of crops, productions, and manufacturing items. Without having nature on our side, the food industry will fall apart. Without the resources to feed the world, manufacturing will collapse. Hunger will be our biggest battle.

C) Control and remedial measures: Some of the remedial and control measures of global warming are listed below:

1. Reduction in consumption of fossil fuels such as coal and petroleum.
2. Use of bio-gas plants.
3. Use of nuclear power plants.
4. Increasing forest cover/ Afforestation.
5. Installation of pollution controlling devices in automobiles (catalytic converter) and industries (Electro Static Precipitators, Bag filters, Wet scrubbers etc)
6. Solar energy may be developed as alternative to the conventional fossil fuel energy

D) Recent Scenarios

1) World's first underwater cabinet meeting

The lowest-lying nation on Earth, the Maldives, highlighted the threat of global warming by holding an underwater cabinet meeting on Oct. 17, 2009. The Cabinet signed a document calling on all countries to cut down their carbon emissions ahead of the U.N. Climate Change Conference in Copenhagen in December.

2) UN Climate Change Conference November-2017

The 2017 UN Climate Conference takes place in Bonn, Germany, from 6-18 November. Leaders of national governments, cities, states, business, investors, NGOs and civil society will gather to speed up climate action to meet the goals of the Paris Climate Change Agreement. The COP is organized by the UN Framework Convention on Climate Change (UNFCCC).

OBJECTIVES:

1) To understand impacts of climate change.
2) To create awareness among people about greenhouse effect.
3) To prevent and reduce effects of global warming

REFERENCES:

1) https://en.wikipedia.org/wiki/globalwarming.

2) Ranjan Kolambe, Environmental Studies Chp.44, pp.256

3) S.P. Misra, S.N. Pandey (2008); Essential Environmental Studies; Chp.40 ,pp 560-565.