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Research Article

TRENDS IN GLOBAL CARBON DIOXIDE EMISSIONS IN THE ATMOSPHERE

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ABSTRACT

Objective: National Geographic noted that there is an exchange of energy between the source (the sun) and the earth's surface, the earth's atmosphere, and the ultimate sink outer space. The ability of the atmosphere to capture and recycle energy emitted by the earth surface is the defining characteristic of the greenhouse effect. Carbon dioxide (CO_2), CH_4, N_2O, and H_2O are greenhouse gases which are responsible for the greenhouse effect. Out of all these, CO_2 is mainly responsible for the greenhouse effect. Therefore, a need was felt to study the variations in CO_2 concentration to be a fundamental factor influencing climatic variations over this time scale. In this study, researchers have chosen only CO_2 gas, and its increasing value worldwide. The study reveals that the recent phenomenon of global warming has been attributed primarily due to increasing atmospheric CO_2 concentration in earth's atmosphere. This study is an attempt to identify the level of increase CO_2 gas emission and atmospheric temperature in the last 5 years.

Methods: Descriptive survey method was used in this research paper.

Results and Conclusion: The research reveals the truth from that the concentration of CO_2 and temperature in the atmosphere have increased during past 5 years.

Keywords: Carbon dioxide, Temperature, Greenhouse effect, ppm.

INTRODUCTION

Carbon dioxide ($CO_{2)}$ is an atmospheric constituent that plays several key roles in the environment. It absorbs infrared (IR) radiations in the atmosphere. Most of the sun's energy that falls on the earth's surface is in the visible light portion of the electromagnetic spectrum. This is in large part because of the earth's atmosphere is transparent to this wavelength. Part of the sunlight is reflected back into space depending on the reflectivity of the surface. Part of the sunlight is absorbed by the earth and held as thermal energy. The heat is then re-radiated in the form of longer wavelength IR radiation. While the dominant gases of the atmosphere (N_2O and CO_2) are transparent to IR, the so-called greenhouse gases, primarily H_2O, CO_2, CH_4 absorb some of the IR radiation. They collect this heat energy and hold it in the atmosphere delaying its passage back out of the atmosphere. Due to part of the warming effects of the greenhouse gases, the global average temperature is about 15**°C**. Without the greenhouse gases, the global average temperature would be much colder.

Greenhouse-induced global warming - Since the industrial revolution got into full swing in the 19th century, we have been burning even increasing amounts of fossil fuels (coal, oil, gasoline, and natural gas) in electric generating plants, manufacturing plants, trains automobiles, airplanes, etc. Burning releases CO_2 into the atmosphere. Because of the emission of CO_2 long stored in fossil fuels, the percentage of CO_2 in the atmosphere has increased.

Consequences

1. Rising ocean temperature causes rising sea level from thermal expansion of the water, melting glaciers, and rising seas level through addition of meltwater to the oceans, increasing coastal erosion, flooding, property damage during coastal storms on top of the potential for major loss of life from storms in low-lying coastal countries such as Bangladesh and Islands nations in the Indian and Pacific Oceans
2. Warmer sea surface temperature will result in more and stronger tropical storms hurricanes and typhoons, increasing loss of life and damage to infrastructure
3. If CO_2 emission increases, plants will grow faster, Arctic species will have no place to go and may not be able to adapt to new conditions
4. Higher heat and expansion of tropical areas may lead to increased incidence of malaria.

Objectives

1. To study the increase of CO_2 gas emission in the last 5 years
2. To study the increase of atmospheric temperature in the last 5 years.

Hypothesis

1. The emission of CO_2 gas is in static state in the last 5 years
2. The atmospheric temperature is in static state in the last 5 years.

METHODS

Descriptive survey method.

The CO_2 gas emission is recorded online from the Mauna Loa Observatory, Hawaii, USA.

The temperature recorded from the World Meteorological Department, Geneva, Switzerland.

RESULTS DISCUSSION AND ANALYSIS

1. Table 1 shows that the emission of CO_2 gas, in the year 2011, was 370 ppm and in 2012, 2013, 2014, 2015 are 394.28, 396.81, 398.7, and 400.26 ppm, respectively. The emission of CO_2 gas has continuously increased in the last 5 years. Hence, the hypothesis number 1 is rejected, and we can say that the level of CO_2 emission is increasing in the last 5 years
2. Table 2 shows that the atmospheric temperature, in 2011, was 0.51°C and in 2012, 2013, 2014, and 2015 are 0.56, 0.65, 0.77, and 0.87°C, respectively. The result shows that the atmospheric temperature has continuously increased in the last 5 years.

CONCLUSIONS

1. The CO_2 gas emission is continuously increasing in the last 5 years
2. The atmospheric temperature is continuously increasing in the last 5 years.

Table 1: CO_2 Emission in ppm and temperature in °C in the last 5 years

Year	2011	2012	2013	2014	2015
CO_2 (in ppm)	370	394.28	396.81	398.78	400.26
Temperature (°C)	0.51	0.56	0.65	0.77	0.87

WHAT WE CAN DO ABOUT GLOBAL WARMING

1. We cannot realistically stop the rise of CO_2 in the near term, but we can slow it and reduce the consequences that will occur. More fuel-efficient cars, less frivolous driving, more use of mass transmit, improved insulation will consume the fuel burned to heat and cool our homes, more efficient appliances, use of fluorescent rather than incandescent light bulbs and careful monitoring of home electricity usage (turn off lights and TV when not in use) can reduce our energy needs
2. Conversion to alternatives such as wind and solar power which do not burn fossil fuels and emit CO_2 into the atmosphere
3. Planting large areas with trees. Stopping deforestation in the tropical forests around the world, especially in the Amazon and Indonesian rainforests, will keep that carbon in the forest rather than send it back into the atmosphere.

Moreover, leaders, societies, communities, local planners, farmers, and health organizations need to recognize the changing climate and rising sea level as they make plans for the future. Our citizens need to be educated as to likely changes and how best to deal with the changing conditions.

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