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Global Warming: Problems and Solutions

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ABSTRACT: It is well known that the entire animal world including human society has entered the 21st century. We all also know that it is necessary to have a clean, balanced and safe natural environment for the physical and mental health of human beings as well as all other living beings. Human society can develop itself systematically only in a clean and balanced natural environment. In the balanced development of human beings, the development of all living beings is also inherent. But for the last few years we are seeing that human being, considered to be the most intelligent being of the earth, is constantly disturbing the natural balance due to its excessive greed, unwanted activities caused by competition to move forward. As a result of this, many types of environmental problems are constantly arising, such as global warming, climate change, ozone depletion, acid rain, pollution, water pollution, weather cycle change etc. These man-made problems are being faced not only by humans but also by other animals. Today, this environmental-borne global problem has become a threat to the entire human race. Global warming or simply global warming, this international crisis remains a serious challenge for all the nations of the world. Not only the developing nations but also the developed nations are not untouched by its ill effects. Today, this problem of global warming has posed a crisis to the entire human race and biodiversity. However, the hand behind this international problem of global warming and biodiversity is also more of the so-called developed nations.

KEYWORDS: global warming, ozone depletion, acid rain, climate change, biodiversity, global warming.

I. INTRODUCTION

The increase in the average temperature of the Earth's atmosphere is called global warming. In the context of global warming, a scholar named Robertson first presented his ideas. He said that the increase in world temperature is global warming. The average temperature of the Earth has increased from 0.6 degree centigrade to 1.2 degree centigrade in the last one year. During the period from 2003 to 2013, the average temperature of the Earth has increased from 0.3 degree centigrade to 0.8 degree centigrade. Scientists believe that, by the end of this century, the average temperature of the Earth will increase from 4 degree centigrade to 6 degree centigrade.

Methodology

Various data sources, publications and observations are undertaken for the analytical study. Secondary data are used to analyze the present situation of green house gases emission. The study of various reports and proceedings of world environmental summits have been undertaken. Tabulation method is used to understand the warming process of the world.

II. RELATED WORK

Various summits and conferences on global warming and related issues were took place. These summits were focused on the various environmental problems and global warming. The United Nations Conference on Environment and Sustainable Development– 1972, The 1st World Climate Conference– 1979, The Conference on the Protection of the Ozone Layer, Vienna– 1985, The Rio Summit – 1992, The World Summit on Sustainable Development– 2002 are mile stones in the field of solution of global warming.

In 2007, Khawas, Vimal discussed about the global warming and climate change in their research study. He also studied the implications for human security in India. Singh, Prof. Bharat Raj & Singh, Onkar in 2012 studied the impacts of global warming on climate change. They also analyze the rise in sea level and the frequency of disasters. Shahzad, Umair in 2015 studied the various facts of Global Warming. He also discussed the causes, effects and solutions.

III. EXPERIMENTAL RESULTS

Global warming and the greenhouse effect are interrelated topics. These subjects are also no longer new to the world, their study is going on all over the world for a long time. In fact, our atmosphere acts like a glass, which allows the rays of the sun to reach the surface of the earth, but does not allow the heat emanating from the surface to go out of the atmosphere again. As a result, the Earth's atmosphere always remains warm, this process is called "green house effect". Water vapor, dust particles and greenhouse gases found in the atmosphere, such as carbon dioxide, carbon monoxide, methane, nitrous oxide, chlorofluorocarbons, etc. Thus it is clear that these elements have a major role in controlling the temperature on earth. These elements, being available in certain quantities, provide us with the necessary heat for life. Due to their excess, the rate of absorption of heat from the earth's surface increases in the atmosphere. Due to which the temperature of the earth starts increasing, this process or effect is known as global warming or green house effect. The amount of greenhouse gases like carbon dioxide, methane, nitrous oxide, chlorofluorocarbons is naturally fixed in the atmosphere. But at present, the amount of greenhouse gases in the atmosphere is increasing continuously due to pollution caused by industrial activities and combustion of organic fuels. For example, the naturally fixed amount of carbon dioxide in the atmosphere is only 0.03 percent. But according to a study, since 1958, the amount of carbon dioxide has increased by more than 9 percent. Since the Industrial Revolution, this gas is rapidly expanding into the atmosphere. Before the Industrial Revolution, where its amount in the atmosphere was 280 ppm, at present it has increased to about 380 ppm. It should also be noted that carbon dioxide is the greenhouse gas with the most impact on the environment.

Major Long-Lived Greenhouse Gases and Their Characteristics

Greenhouse gas	How it's produced	Average lifetime in the atmosphere	100-year global warming potential
Carbon dioxide	Emitted primarily through the burning of fossil fuels (oil, natural gas, and coal), solid waste, and trees and wood products. Changes in land use also play a role. Deforestation and soil degradation add carbon dioxide to the atmosphere, while forest regrowth takes it out of the atmosphere.	see below*	1
Methane	Emitted during the production and transport of oil and natural gas as well as coal. Methane emissions also result from livestock and agricultural practices and from the anaerobic decay of organic waste in municipal solid waste landfills.	12.4 years**	28–36
Nitrous oxide	Emitted during agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste.	121 years**	265–298
Fluorinated gases	A group of gases that contain fluorine, including hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride, among other chemicals. These gases are emitted from a variety of industrial processes and commercial and household uses and do not occur naturally. Sometimes used as substitutes for ozone-depleting substances such as chlorofluorocarbons.	A few weeks to thousands of years	Varies (the highest is sulfur hexafluoride at 23,500)

Source: <https://www.epa.gov/climate-indicators/greenhouse-gases>

According to the report of the Panel of the United Nations Environment Program, about 380 crore tonnes of carbon dioxide gas is being dissolved in the atmosphere every year due to the burning of fossil fuels such as coal, petrol etc. It is not only making it toxic by dissolving in the atmosphere, but it is also increasing the danger of green house side effects. Most of the emissions of carbon dioxide are being done by developed countries in the world. The ten leading developed countries of the world are producing more than 70 percent of the total carbon dioxide accumulation in the atmosphere. The US alone is emitting more than 22 percent of the world's carbon dioxide gas. Similarly, China and Commonwealth countries together are emitting more than 50 percent carbon dioxide gas. It is ironic that the developing countries of the rest of the world are also suffering the ill effects of global warming, while these countries have a negligible contribution in its growth.

Like carbon dioxide gas, methane, nitrous oxide and chlorofluorocarbons are also responsible for greenhouse effect. The amount of methane gas, which is formed from the combination of carbon and hydrogen, is also increasing in the atmosphere at the rate of 1 percent per year. According to an estimate, about 52 crore tonnes of methane gas is dissolved in the atmosphere every year. Similarly, the emission of chlorofluorocarbons is increasing continuously due to the use of refrigerators, air-conditioners (ACs), cosmetics, fire fighting equipments etc. Chlorofluorocarbons are responsible for increasing the greenhouse effect as well as the depletion of the ozone layer. The process of depletion of the ozone layer is also indirectly a major cause of global warming. According to an estimate, at present there is a hole in the ozone layer equal to the size of Europe continent, all this is a side effect of increasing emission of green house gases. Although greenhouse gases such as chlorofluorocarbons, methane and nitrous oxide are more dangerous than carbon dioxide, carbon dioxide gas is most affected due to being emitted in the highest amount. In the period from 1970 to 2000, the amount of greenhouse gases has increased by about 70 percent. Along with this, combustion of organic fuels, destruction of forests, excessive industrialization, increasing use of means of transport, materialistic lifestyle etc. is also mainly responsible for global warming and its side effects. An interesting fact has emerged from a recent study that, while the developed countries were emitting the most carbon dioxide gas so far, by the year 2025, the developing countries will be emitting the highest amount of carbon dioxide up to 25 percent in the world. It proves that, even the developing countries are no longer untouched by the increasing effects of the materialistic lifestyle.

Due to our arbitrary tampering with nature, now the feet of balanced climate have also faltered for centuries. Today the earth is getting warmer day by day. It should be noted that, as a result of the increase in green house gases, the physical and chemical nature of water, land, air and biospheres will not remain unaffected.

Effects of increase in global warming

1. As a result of the increase in greenhouse gases, many effects are being reflected due to the increasing temperature of the earth's surface and atmosphere. Global warming will cause hundreds of problems such as climate change, adverse effects on agriculture, rise in sea level, damage to surface ecosystems, damage to marine ecosystems, depletion of ozone layer, destruction of the biological world. The abnormal increase in temperature will disturb the normal process of heating and cooling of the atmosphere. As a result, effects such as unpredictable rainfall, famine, rapid meteorological variability will begin to appear.
2. Presently, the rate of increase in temperature is estimated to be about 0.2 centigrade per decade. According to a study, by the year 2030, the average temperature of the Earth will increase from 1 degree centigrade to 2 degree centigrade. Doubling the amount of carbon dioxide will increase the average temperature of the earth by up to 4 degrees centigrade. Due to such a high increase in global temperature, the weather cycle will be completely destroyed. We all are realizing that, at present also the duration of summers is increasing and the duration of winters is getting shorter. People have not forgotten the fierce heat of this year yet. As the temperature rises, more water vapor will form, resulting in a decrease in the transparency of the atmosphere.
3. Climate change will adversely affect agriculture and increase the uncertainty of production. Melting glacial ice is increasing the amount of seawater, leading to an unexpected rise in sea level. According to the images obtained from satellites, the sea level in the world has increased by 10 to 20 centimeters. The sea level has risen by 3.2 mm during the last 20 years. In our country, 20 percent of the population lives in the coastal regions. Therefore, climate change and global warming have emerged as a challenge to our coastal range.
4. The effect of increasing temperature continuously in the world has also affected the production quantity of crops. Due to this there has been a decline in food grains in the world, according to a study by Columbia University, the wheat crop has decreased by 5.5 percent and the corn crop has decreased by 3.8 percent. The apple producing farmers of the Himalayan region are now growing the crops of the hot regions. The biological world is also not going to remain untouched by the effects of global warming.

5. Due to increase in temperature, diseases like malaria, dengue, chikungunya, asthma etc. will increase, as well as problems like psychological imbalance will also arise. In the event of the migration of animals and birds and the extinction of many species, the ecosystem will be completely disturbed.

Measures to stop global warming

However, it is also certain that it is difficult to stop the effects of global warming immediately. But by controlling the anti-human activities of nature, it can be brought in a balanced state gradually in time. For this the following measures will have to be implemented as soon as possible.

1. All the developing and developed countries of the world have to cut down on the use of fossil fuels. Developed countries use mineral oil of about 50 percent of the gross world, so they should take initiative in this direction.
2. All the countries had signed a resolution to reduce the emission of greenhouse gases by the year 2012 at the Earth Summit held in Kyoto city of Japan. By taking the first step in this regard, Australia has assured to reduce 150 million tonnes of carbon emissions by the year 2020. Therefore, for its effective solution, all the nations have to implement the important points of the Kyoto Protocol Convention.
3. In order to reduce the emission of greenhouse gases, alternative sources of petroleum and coal will have to be discovered and their use will have to be promoted. For example, methanol obtained from methane may be a better substitute for petroleum, which is also safer than petrol. Similarly, emphasis should also be given to increase the development and use of solar energy, wind energy, geothermal energy, bio-fuel etc.
4. We have to improve the working of automatic machines and engines by increasing our technical capability and efficiency, so that this can reduce fuel consumption to a minimum, resulting in reduction of production of toxic gases.
5. There is a huge potential for the development of biogas and bio-fuel in developing countries, because due to the dense population in these countries, the waste materials required for biogas can be available in large quantities. This will stop deforestation, while on the other hand the pollution caused by the use of coal and petroleum will be stopped.
6. We should promote the use of Natural Compressed Gas (CNG) to prevent the emission of greenhouse gases from the means of transport. It is necessary for us to mention here the "odd-even" formula implemented by the Delhi government some time back. Due to its experimental testing, there was a huge reduction in the emission of green house gases. Other states can also do such innovations in the field of transport.
7. Similarly, another measure can be effective for effective prevention of greenhouse gases. For example, car pulling, use of means of water transport, use of air-conditioned equipment only when absolutely necessary, essential and limited use of cosmetics, such as deodorant, perfume etc. All these measures can be possible only with individual and collective public participation.
8. A comparative analysis of some places of Jaipur city was recently done by us to solve the problem of increasing emission of greenhouse gases. Personal tests revealed the fact that Transport Nagar, Sindhi Camp Bus Stand, Railway Station, Sitapura Industrial Area and the area around Char Diwari Complex remained "hotspots" of greenhouse gas emissions. Heavy vehicular movement and operation of factories between 10 am to 12 am and 4 pm to 8 pm have resulted in heavy emission of greenhouse gases at these places. Jaigarh and Nahargarh forts of Jaipur have also started showing adverse effects on local bio-diversity due to increasing number of tourists and heavy movement of vehicles. The condition of Bassi, Bagru, Chaksu, Dudu, Amer etc. in the suburban areas of Jaipur has also become very worrying. For this, it is necessary to take effective measures at the local level also.

9. As is well known, the effect of greenhouse gases can be limited by dense plantation and the increasing effect of carbon dioxide can be stopped. Therefore, we should try to achieve it by setting a target of about 33 percent forest cover everywhere.

IV. CONCLUSION

Thus, it can be said that the solution to this formidable problem of greenhouse gases will prove to be effective only when we make collective efforts from individual level to international level for this. Earth Day is celebrated every year on 22 April to make people aware of the environment. In 2013, its theme was "The Face of Climate Change". Similarly, considering every day as an environmental protection day, it should be made the medium of the message of making the common man aware of the environment. If we talk about India, then to solve the problem of global warming, it always keeps its partners in international forums. Now the need is that the decisions taken in the Earth Summits held from time to time should be implemented honestly by all the nations. Global warming is a deep crisis on the future of mankind, for which we ourselves are responsible for both the cause and the solution, that is, we are the question and we are the answer.

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