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Restricting the roots of Global warming

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Abstract:

The term Global warming is used to denote the climatic change that is taking place around the globe due to the emission of gasses by burning fossil fuels, riding vehicles and other human and natural activities. Presence of these gasses above a certain level forms a trap which allows different gases from sun to come on earth but doesn't allow the same gases to go back, thus creating greenhouse effect on earth. All these things increase the average temperature of Earth's surface. The impact of global warming can be noticed on the entire planet. Melting glaciers, rising sea level, severe droughts, skin allergies, asthma and other problems are witnessed frequently from last few decades. Roots of global warming are deep enough, so it will require same number of efforts on the part of mankind to get out of this situation. This paper will throw light on certain measures that would definitely help in reducing global warming up to some extent. Some of them are- planting trees, pulling out carbon from the environment, cutting on emissions of harmful gases and by adapting organic farming, using solar energy & tidal energy, green chemicals and other renewable sources of energy.

Keywords: *Global warming, green chemicals, solar energy, tidal energy, organic farming.*

Introduction

The term global warming was first used by a scientist Wallace Smith Broecker in a science paper on 8th August 1975. It is a term which is used to denote the climatic changes that are occurring world wide. The terms global warming and climatic change are used interchangeably but more precisely global warming is rise in earth's temperature due to human deeds. The earth is heating up. The land as well as ocean is becoming warmer. To understand it quantitatively, a report of

NOAA (National Oceanic and Atmospheric Administration) can be considered, it says that between the period of 1880 -2016 a total rise of 0.95°C is being recorded which is 0.07°C in addition to the expected rise per decade in earth's temperature. On an average the earth's temperature is 1°C higher than it used to be before Industrial revolution, of 1850. According to scientists by the year 2100 there would be a hike of approximately 1.5°C to 5°C in the temperature as compared to that of 1850. The impact of global warming can be noticed on the entire planet. Melting glaciers, rising sea level, severe droughts, skin problems, allergies, asthma, other diseases and problems are witnessed throughout the last few decades due to warming globe. The world is in danger, the life is at risk. As the roots of global warming are deep enough, it will require great amount of efforts on the part of mankind to get out of this situation. One of the major reasons responsible for global warming is green house effect which is eminently caused by combustion of fossil fuels. In this a trap of certain gases is formed at certain height in atmosphere which prevents the warmth of the Sun and other gases to escape in the void of space. This retention of gases increases the temperature of earth's surface and this whole process is termed as greenhouse effect. This name had been taken from basic concept of greenhouse which is constructed to provide hotter environment to the plants which needs it such as tomatoes and tropical flowers. Carbon- di- oxide, ozone, methane and water vapour are the major gases responsible for creating green house effect. Although this green house effect makes it possible for us to live on earth. In absence of the green house effect the temperature of earth would have been lesser by approximately 30°C which would make the survival impossible. So it serves as a thick blanket on the earth. This process is quite natural but when some hazardous (infrared) rays penetrates down towards earth and along with them the emissions from vehicles, air conditioners, refrigerator and combustion of fossil fuels increases up to great extent then it creates an alarming situation. As these rays and gases get trapped in the atmosphere, this process leads to increase in average temperature beyond the expected or desired level and contributes to global warming. So efforts should be made to reduce this effect from earth's atmosphere. This paper throws light on some of the measures which will help in restricting the roots of global warming.

Measures for reducing global warming

1. Plantation
2. Pulling out carbon from environment
3. Adapting organic farming
4. Green Chemistry
5. Green Building

6. Tidal energy/Tidal Power
7. Solar Energy
8. Nano Solar Energy
9. Enhanced Geothermal Systems
10. LED Light

1. **Plantation-** No doubts, plants absorb carbon-di-oxide from the environment to carry on its process of photosynthesis and release oxygen in return. It can help by soaking the pollution from air and thus making it pure and healthy to breathe. New research shows that a world wide plantation program could reduce 2/3 part of total emissions from human activities in the environment. Crowther said that, “it is the cheapest one possible and every one of us can get involved.” Other scientists also stressed that in order to avoid catastrophic climate impacts carbon should be removed from the environment. Jean Francois Bastin said that, “Governments must now factor (tree restoration) into their national strategies.
2. **Pulling out Carbon from Environment-** There are several CDR strategies for pulling out carbon from environment. Some of them are as follows-
 - **Afforestation and Reforestation-** Afforestation means planting trees at those places where there were no trees earlier. Afforestation helps a lot in reducing global warming as when plants grow they intake carbon-di-oxide from the atmosphere, turn it into sugar through photosynthesis. According to reports, forests absorb approximately 1/3rd of the entire world's carbon emissions. Reforestation is either a natural or intentional process of restocking the existing forests or planting tree seeds or young trees in an area where there used to be a forest earlier. Thus Reforestation and afforestation are the processes which help in minimizing the problem of ever growing percentage of carbon dioxide in the atmosphere.
 - **Carbon mineralization-** It is a new emerging approach or strategy to remove CO₂ from the air. It acts in two ways one is to store CO₂ in the form of carbonate minerals (as solid storage) and the other one is by removing CO₂ from air and store it in carbonate minerals. In both the ways it proves to be beneficial for reducing CO₂.
 - **Direct air capture-** This technology is still in its early years of life. As a lot more is to be done in this direction. In this process CO₂ is directly captured and stored from the air rather than the source point. Here the air flows through the filter where carbon dioxide and other greenhouse gases are removed.
 - **Soil carbon sequestration-** In this process CO₂ is removed from the atmosphere and gets stored in the soil carbon pool by the plants through photosynthesis with carbon stored in

the form of SOC. According to IPCC soil carbon sequestration have the ability to reduce at the lowest cost of \$0 - \$100 per ton, and it is expected to remove about 2-5 giga tonnes of carbon-di-oxide a year by 2050.

- **Bioenergy with carbon capture and storage-** Burning fossil fuels for generating electricity and releasing CO₂ from the chimneys of power plant in the air is a common practice. But in the year 2015 all the countries of UN met in Paris and decided to keep the mean global temperature well below 2°C. For achieving this goal of Paris agreement emission from fossil fuel needs to be zero and that too quite rapidly. Bioenergy with carbon capture and storage came to be seen as the most feasible and cost effective active emissions technology. This technology is consisted of several components and stages as biomass feedstock and collection, conversion of this feedstock into heat, electricity, liquid or gas fuels, and capturing the released carbon dioxide under ground instead of releasing it into air.
3. **Adopting Organic Farming** – The concept of organic farming is not new to India as it has been practiced in our country since ancient time. The farmers here used to cultivate Crops in a manner which keeps the soil alive and healthy by using organic wastes such as crop, animal and farm wastes. But in western countries it is considered as an alternative farming process which originated in early 20th century as reaction to the conventional farming practices which are proving harmful for life on earth as it uses synthetic chemicals, pesticides and other harmful products and activities for crop production. Organic farming practices aims at reducing pollution, conserving water, increasing soil fertility, and consuming less energy. It uses natural fertilizer such as manure, compost and naturally derived pesticides for production. The food thus produced is much nutritious, healthier and beneficial for health as well as environment.
 4. **Green chemistry-** The concept of green chemistry is given by Paul Anastas. It applies throughout the life cycle of a chemical product such as it's design, manufacturing, usage and even disposal. It is also known as sustainable chemistry. In other words it can be said that the chemical products and processes that are designed in such a way that they reduce or eliminate the use and generation of harmful substances. It is based on the principle that it is better to prevent waste than to treat or clean-up after it is created. Thus green chemistry reduces the negative impact of harmful chemical products on human health and environment.
 5. **Green building-** Another names of this are green construction or sustainable building. It focuses on increasing the building's efficiency through its design, construction, operation and maintenance also. Some items that differs significantly from conventional building are as follows- wool bricks (obtained by adding wool and natural polymer), triple glazed windows,

solar tiles (absorbs large amount of heat from sun) , bamboo flooring, Ecological concrete (admixture, di calcium silicate instead of cement), paper insulation panel (made from recycled newspapers and cardboard, insects resistant and fire retardant). These buildings are quite environment friendly. The first green building programme was established in city of Austin (U.S.) in 1990. While in India a federation named as Indian Green Building Council was formed by Confederation Indian Industry in 2001. This federation aimed at making India one of the global leaders in green building by 2021. Till now 1053 green buildings are being constructed all over India out of which 810 are certified and fully functional.

6. **Tidal Energy/Tidal Power-** Tidal energy is the process of converting the energy from tides into electricity and other useful forms of power. Waves have the power to generate a high amount of energy i.e.2700 GW. Waves are created by wind as it blows across the ocean or sea surface. So it is one of the most environment friendly forms of energy. It is not yet widely used renewable source of energy although tides are more predictable in comparison to wind and the sun. Traditionally tidal energy suffered the issues of non availability of proper sites and relatively high cost but now with technological advancement it is gaining recognition. The process of spinning turbines to generate electricity, using falling water was introduced in US and Europe in 19th century. World's first large scale power plant was Rance Tidal Power Plant in France, which became operational in 1966.
7. **Solar Energy.** - Solar energy is transformation of heat that comes from sun into electricity or other useful forms of power. This form of energy is being used for thousand of years in different ways for various purposes. Earlier it was used for cooking, heating and drying but now it is also used for generating electricity. It is renewable, cheaper and environment friendly source of energy. Along with this it is an alternative to coal and oil also thus its use would help excessively in reduction of global warming.
8. **Nano Solar Energy-** This system was discovered in 2002. It insists on the fact that on a sunny day, the rays of sun emits approximately 1000wt of energy/sq. mtr. If all of this energy is collected properly it will be sufficient to illuminate our houses and offices for free. Nano solar foils can be effectively for this purpose.
9. **Enhanced Geo Thermal Systems-** In this system heat energy is harvested from the core or mantle of Earth to produce electricity. These plants are usually set in the areas with thin crust in Mohorovicic discontinuity.
10. **LED light-** Replacing the old fashioned light bulbs with LEDs is playing an important role in fighting with the problem of global warming just as the windmills or electric cars. The light-emitting diode or LED light has brought about a revolution by producing white glow bulb.

These lamps are environment friendly as well as pocket friendly as it consumes less power i.e. 80 less than traditional incandescent lamps

Conclusion

Global warming is a problem that is taking the shape of giant which is threatening life on the planet earth. Thus immediate action is expected in this direction. Some of the strategies have been discussed above which can help in minimizing the problem. Government is trying its level best but only the rules and laws made by them or the initiatives taken at higher level will not suffice until every single individual contributes at his/her own level. These strategies if executed properly will surely yield best results with in short period of time. As the roots of global warming are quite deep thus serious and continuous efforts are required for restricting its growth.

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