Journal of Advances and Scholarly Researches in Allied Education
Vol. 16, Issue No. 6, May-2019, ISSN 2230-7540

Global Warming Effect to Our Green Earth

Pardeep[1]* Seema Rani[2]

[1] M. A. Geography (NET, JRF)

[2] M. A. Geography

"Only after the last tree has been cut down. Only after the last river has been poisoned. Only after the last fish has been caught. Only then will you find that money cannot be eaten."

Cree Indian Prophecy

Abstract – Global warming and climate change refer to an increase in average global temperatures. Natural events and human activities are believed to be contributing to an increase in average global temperatures. This is caused primarily by increases in "greenhouse" gases such as Carbon Dioxide (CO2). It is being clear that human activities have caused most of the century's warming by releasing heat-trapping gases-called greenhouse gases into the atmosphere. In the present study, an attempt has been made to develop an empirical model and study the empirical aspects of the global climate change by applying the mass energy concept to the earth atmosphere system, assuming that the atmosphere is in hydrostatic balance. Further, we assumed that the earth atmosphere system behaves as a black body. The presence of the gas in the atmosphere keeps some of the radiant energy received by the earth from being returned to space, thus producing the so-called greenhouse effect. The results of the study pointed out that the global temperature changes due to mass increase as a whole of the earth atmosphere system for the period 1900-2050. These changes in global warming are due to temperature increases from 0.053oC to 0.84oC. The predicted changes are in good agreement with the observed global warming (IPCC, 1990). The temperature changes due to doubling of CO2 are only 0.02oC by 2050. The global warming due to temperature changes may be attributed to increase in mass as a whole including greenhouse gases (CO2, water vapor, particulate and other CFC's) and human activity and feedbacks.

Key Words – Global, Vapor, Greenhouses, Atmosphere.

----------X----------

I. INTRODUCTION

The continuous rise in temperature of the planet is really upsetting. The root cause for this is global warming. Global warming begins when sunlight reaches the Earth. The clouds, atmospheric particles, reflective ground surfaces and surface of oceans then sends back about 30 % of sunlight back into the space, whilst the remaining is absorbed by oceans, air and land. This consequently heats up the surface of the planet and atmosphere, making life feasible. As the Earth warms up, this solar energy is radiated by thermal radiation and infrared rays, propagating directly out to space thereby cooling the Earth. However, some of the outgoing radiation is re-absorbed by carbon dioxide, wate water vapors, ozone, methane and other gases in the atmosphere and is radiated back to the surface of Earth. These gases are commonly known as greenhouse gases due to their heat-trapping capacity. It must be noted that this re-absorption process is actually good as the Earth's average surface temperature would be very cold if there was no existence of greenhouse gases. The dilemma began when the concentration of greenhouse gases in the atmosphere was artificially increased by humankind at an alarming rate since the past two centuries. As of 2004, over 8 billion tons of carbon dioxide was pumped thermal radiation is further hindered by increased levels of greenhouse gases resulting in a phenomenon known as human enhanced global warming effect. Recent observations regarding global warming have substantiated the theory that it is indeed a human enhanced greenhouse effect that is causing the planet to heat up. The planet has experienced the largest increase in surface temperature over the last 100 years. Between 1906 and 2006, the Earth's average surface temperature augmented between 0.6 to 0.9 degrees Celsius, however out per year. Millions of pounds of methane gas are generated in landfills and agricultural decomposition of biomass and animal

manure. Nitrous oxide is released into the atmosphere by various nitrogen-based fertilizers including urea and ammonium phosphate and other soil management utilizations. Once released, these greenhouse gases stay in the atmosphere for decades or even longer. According to Intergovernmental Panel on Climate Change (IPCC), carbon dioxide and methane levels have increased by 35 % and 148 % since the industrial revolution of 1750.

Source:
https://www.aftermathmag.org/deforestfacts.html

II. GREENHOUSE EFFECT

While other planets in the solar system of the Earth are either roasting hot or bitterly cold, Earth's surface has relatively mild, steady temperatures. Earth enjoys these temperatures because of its atmosphere, which is the thin layer of gases that cover and protect the planet. However, 97 % of climate scientists and researchers agree that humans have changed the Earth's atmosphere in dramatic ways over the past two centuries, resulting in global warming. To understand global warming, it is first necessary to become familiar with the greenhouse effect. As Fig.1 depicts, the natural greenhouse effect normally traps some portion of heat in such a way that our planet is safe from reaching freezing temperatures while human enhanced greenhouse effect leads to global warming. This is due to burning of fossil fuels which increase the amount of greenhouse gases (carbon dioxide, methane and oxides of nitrogen) present in the atmosphere.

The trade of incoming and outgoing radiation that heats up the Earth is often referred to as the greenhouse effect because a greenhouse works in a similar way (Fig.2). Incoming ultraviolet radiation easily passes through the glass walls of a greenhouse and is absorbed by the plants and hard surfaces inside. Weaker infrared radiation, however, has difficulty passing through the glass walls and is trapped inside, therefore, warming the greenhouse. This effect lets tropical plants prosper inside a greenhouse, even during a cold season.

A similar phenomenon takes place in a car which is parked outside on a cold sunny day. Incoming solar radiation warms the interior of the car but outgoing thermal radiation is trapped inside the closed windows of the cars. This entrapment basically warms up the car. This trapping occurs in such a way that the hot air does not rise and does not lose energy though convention.

In the words of Michael Daley, an Associate Professor of Environmental Science at Lasell College: "Gas molecules that absorb thermal infrared radiation, and are in significant enough quantity, can force the climate system. These types of gas molecules are called greenhouse gases". Carbon dioxide and other greenhouse gases act like a mantle, absorbing infrared radiation and preventing it from escaping into the outer space. The net effect is the regular heating of the Earth's atmosphere and surface. The greenhouse effect, combined with increasing levels of greenhouse gases and the resulting global warming, is expected to have philosophical implications. If global warming continues unrestrained and nothing effective is done to limit this evil, it will cause significant climate change, a rise in sea levels, extreme weather events and other ruthless natural, environmental and social impacts

III. CAUSES OF GLOBAL WARMING

The major cause of global warming is the greenhouse gases. They include carbon dioxide, methane, nitrous oxides and in some cases chlorine and bromine containing compounds. The build-up of these gases in the atmosphere changes the radioactive equilibrium in the atmosphere. Their overall effect is to warm the Earth's surface and the lower atmosphere because greenhouse gases absorb some of the outgoing radiation of Earth and re-radiate it back towards the surface. The net warming from 1850 to the end of the 20th century was equivalent to nearly 2.5 W/m2 with carbon dioxide contribution about 60 % to this figure, methane about 25 per cent, with nitrous oxides and halocarbons providing the remainder. In 1985, Joe Farman, of the British Antarctic Survey, published an article showing the decrease in ozone levels over Antarctica during the early 1980s. The response was striking: large scale international scientific programmers were mounted to prove that CFCs (used as aerosol propellants in industrial cleaning fluids and in refrigeration tools) were the cause of the problem. Even more important was abrupt international action to curb the emissions of CFCs.The second major cause of global warming is the depletion of ozone layer. This happens mainly due to the presence of chlorine containing source gases. When ultraviolet light is present, these gases dissociate releasing chlorine atoms which then catalysis ozone destruction Aerosols present in the atmosphere are also causing global warming by changing the climate in two different ways. Firstly, they scatter and absorb solar and infrared radiation and secondly, they may alter the microphysical and chemical properties of clouds

and perhaps affect their lifetime and extent. The scattering of solar radiation acts to cool the planet, while absorption of solar radiation by aerosols warms the air directly instead of permitting sunlight to be absorbed by

The surface of the Earth. The human contribution to the amount of aerosols in the atmosphere is of various forms. For instance, dust is a by-product of agriculture. Biomass burning generates a mixture of organic droplets and soot particles. Many industrial processes produce a wide diversity of aerosols depending on what is being burned or generated in the manufacturing process. Moreover, exhaust emissions from various sorts of transport produce a rich mixture of pollutants that are either aerosols from the outset or are transformed by chemical reactions in the atmosphere to form aerosols.

IV. GLOBAL WARMING: THE EFFECTS

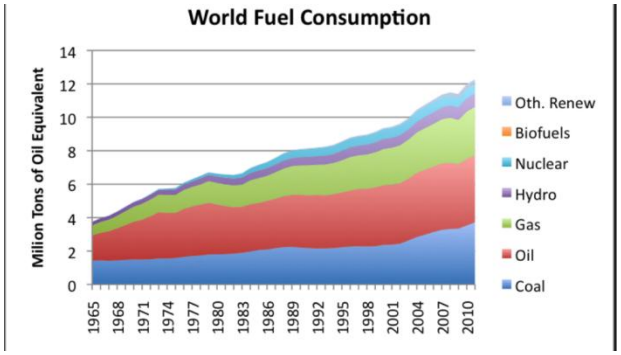
Predicting the consequences of global warming is one of the most difficult tasks faced by the climate researchers. This is due to the fact that natural processes that cause rain, snowfall, hailstorms, rise in sea levels is reliant on many diverse factors. Moreover, it is very hard to predict the size of emissions of greenhouse gases in the future years as this is determined majorly through technological advancements and political decisions. Global warming produces many negative effects some of which are described here. Firstly, extra water vapor which is present in the atmosphere falls again as rain which leads to floods in various regions of the world. When the weather turns warmer, evaporation process from both land and sea rises. This leads to drought in the regions where increased evaporation process is not compensated by increased precipitation. In some areas of the world, this will result in crop failure and famine particularly in areas where the temperatures are already high. The extra water vapor content in the atmosphere will fall again as extra rain hence causing flood. Towns and villages which are dependent on the melting water from snowy mountains may suffer drought and scarcity of water supply. It is because the glaciers all over the world are shrinking at a very rapid rate and melting of ice appears to be faster than previously projected. According to Intergovernmental Panel on Climate Change (IPCC),

About one-sixth of the total population of the world lives in the regions which shall be affected by a decrease in melting water. The warmer climate will likely cause more heat waves, more violent rainfall and also amplification in the severity of hailstorms and thunderstorms. Rising of sea levels is the most deadly affect of global warming; the rise in temperature is causing the ice and glaciers to melt rapidly. This will lead to rise of water levels in oceans, rivers and lakes that can pilot devastation in the form of floods [6]. As evident from Fig. 5, temperature anomalies are projected to increase in coming years. Before, the 20th century, the situation was well under control but the beginning of the current century, the situation started to worsen .This was all due to increase in global warming majorly due to the fact that new industries and power houses started operation and emitted harmful gases which cause the planet to heat up. This data is based on

V. EFFECTS ON LIVING BEINGS

Global warming can severely affect the health of living beings. Excess heat can cause stress which may lead to blood pressure and heart diseases. Crop failures and famines, which are a direct consequence of heating up of earth, can cause a decline in human body resistance to viruses and infections. Global warming may also transfer various diseases to other regions as people will shift from regions of higher temperatures to regions of comparatively lower temperatures. Warmer oceans and other surface waters may lead to severe cholera outbreaks and harmful infections in some types of sea food [11]. Moreover, it is an established fact that warmer temperatures lead to dehydration which is a major cause of kidney stones. A medical team from The Children's Hospital of Philadelphia examined the health proceedings of more than 60,000 Americans alongside weather records. They discovered that individuals were most likely to be hospitalized with kidney stones three days after a temperature rise. Since 1994, kidney stone incidence has risen from about one in 20 people to one in 11. This trend is likely to increase as the globe gets hotter.

Global warming is also affecting animals. They need to move to cooler places in order to survive. This process has been observed in various places, for instance, in the Alps, in mountainous Queensland in Australia, and in the misty forests of Costa Rica. Fish in the North Sea have been reported to move northwards too .The impacts on species are becoming noteworthy to such an extent that their movements can be used as a sign of a warming world. They are the silent witnesses of the swift changes being inflicted on the Earth. Scientists and researchers predict that global warming is gradually damaging the ecosystems of various species and is playing a very unconstructive role in making

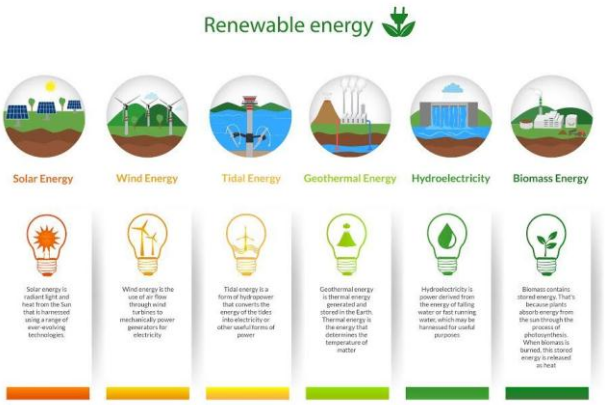


Source: World fuel consumption in recent years

Them extinct. For instance Asia's only ape – the orang-utan – is in bottomless trouble. Its last remaining strongholds in the rainforests of Indonesia are being endangered by a range of pressures, including climate change, putting the animal at the menace of extinction within a few decades. With global warming continually increasing the duration and frequency of droughts, bushfires are occurring more often in these heavily logged forests, further fragmenting the orang-utan 's living domain. Similarly, in Africa, elephants face a series of threats including shrinking living space, which brings them more regularly into divergence with people. With this reduced living space, elephants will be unable to escape any changes to their natural habitat caused by global warming, including more common and longer dry periods, placing further pressure on their survival.

VI. ALTERNATIVE ENERGY SOURCES

The hazards caused by global warming are tremendous. Excessive use of fossil fuels such as coal, natural gas and oil play a part in it too. The usage of fossil fuels should be discontinued immediately. The most significant solution to put an end to this disaster is the use of alternative energy sources. They include wind, solar, bio mass, geothermal and hydro. The most noteworthy point in using these sources is their clean nature. They do not produce any sort of pollution or toxic gases that can lead to global warming. They are environmentally friendly and pose no threat to ecological balance. However, their high installation and setup costs may drive energy companies away from them at first but in the long run they are surely beneficial for everyone. Most importantly, fossil fuels will deplete one day and sooner or later, we have to turn to renewable energy sources for energy production. Thus, the eventual solution to end global warming is to use alternative energy sources.



Source : https://www.google.com/search?q=green+energy+pictures&safe

Other Solutions

You can help to reduce the demand for fossil fuels, which in turn reduces global warming, by using energy more wisely. Here are 10 simple actions you can take to help reduce the warming of our oceans and our planet. For the full story of the Ice Bord, please click here.

1. Reduce, Reuse, Recycle

Reduce waste by choosing reusable products instead of disposables. Buy products with minimal packaging. Recycle paper, plastic, newspaper, glass and aluminum cans. By recycling half of your household waste, you can save 1088kg of carbon dioxide every year.

2. Use Less Heat and Air Conditioning

Add insulation to your walls and attic, it can lower your heating costs more than 25 percent, by reducing the amount of energy you need to heat and cool your home. Turn down the heat while you're sleeping at night or away during the day, and keep temperatures moderate at all times. Setting your thermostat just 2 degrees lower in winter and higher in summer could save about 907kg of carbon dioxide each year.

3. Change your lightbulbs

Replace regular light bulbs with compact fluorescent light (CFL) bulbs. CFLs last 10 times longer than incandescent bulbs, use two-thirds less energy, and give off 70 percent less heat.

4. Drive less and drive smarter

Go surfing with friends, Walk and ride your bike more and check out options for carpooling to work or school. When you do drive, make sure your car is running efficiently. For example, keeping your

tires properly inflated can improve your petrol mileage by more than 3 percent.

5. Buy Energy-Efficient Products

When it's time to buy a new car, choose one that offers good mileage. Home appliances now come in a range of energy-efficient models, and compact florescent bulbs are designed to provide more natural-looking light while using far less energy than standard light bulbs.

Avoid products that come with excess packaging especially molded plastic and other packaging that can't be recycled.

6. Use Less Hot Water

Set your water heater at a lower tempreture to save energy and buy low-flow showerheads to save hot water and about 350 pounds of carbon dioxide yearly. Wash your clothes in warm or cold water to reduce your use of hot water and the energy required to produce it.

7. Use the "Off" Switch

Save electricity and reduce global warming by turning off lights when you leave a room, and using only as much light as you need. And remember to turn off your television, video player, stereo and computer when you're not using them. It's also a good idea to turn off the water when you're not using it. While brushing your teeth, shampooing the dog or washing your car, turn off the water until you actually need it for rinsing. You'll reduce your water bill and help to conserve a vital resource.

8. Plant a Tree or two

If you have the means to plant a tree, start digging. During photosynthesis, trees and other plants absorb carbon dioxide and give off oxygen. A single tree will absorb approximately one ton of carbon dioxide during its lifetime.

9. Keep an eye on your local beach

It's your responsibility to look after your local spot. Keep an eye on changes, pick up litter, use your local status to increase respect for the ocean environment.

10. Encourage Others to Conserve

Share information about recycling and energy conservation with your friends, neighbors and co-workers, and take opportunities to encourage public officials to establish programs and policies that are good for the environment.

These 10 steps will take you a long way toward reducing your energy use and your monthly budget. And less energy use means less dependence on the fossil fuels that create greenhouse gases and contribute to global warming and the raising of temperatures in our oceans.

The Environment approach

Put the environment first. Global warming is an enormous threat. But it's just one symptom of our unhealthy relationship to our environment. To meet the climate challenge, we must put the environment first. Through our research and public education, we're working to shift more hearts and minds over to this point of view.

Take a strategic approach. We must think big and act boldly, but we recognize that progress comes one step at a time. Our focus is on making a difference in public policy and in our lives and our environment, not just making a statement.

Build on what works. We've won policies, actions and decisions that have resulted in reduced carbon pollution across the country. We know which policies work, how they can be improved, and what it takes to win their approval. As always, we're also open to new ideas that work even better.

Work together. We work to unite people from all across the political spectrum around action on global warming, whether it's drivers who want to go electric or small business owners who can benefit from smart climate action programs. Our advocates in Washington, D.C., lobby members of Congress from both parties. Our advocates in the states build coalitions that include doctors and nurses, religious leaders and educators, and people from all walks of life. Our organizers and canvassers engage hundreds of thousands of people. Our members and activists live in all 50 states.

CONCLUSION

The scientific and environmental community is on the same page regarding the bitter reality of global warming and the involvement of human factor in it. The paper discussed here has only dented the surface of what is a very intricate line of scientific and engineering exploration. Global warming is a big hazard and appropriate measures must be taken to tackle this serious problem. This problem is not only causing trouble to the human beings but also to animals and plants. Melting of polar ice caps will lead to floods which can cause mayhem everywhere. Rise of sea levels will devastate agricultural and fishing activities. To embark upon these problems, some remedial steps must be timely taken which include but are not limited to the use of renewable sources of energy and stopping

deforestation. Innovative solutions must be brought forward to end this hazard once and forever.

REFERENCE

Anthes, R.A., Corell, R.W., Holland, G., Hurrell, J.W., MacCracken, M.C., & Trenberth, K. (2010, February 12). Hurricanes and Global Warming—Potential Linkages and Consequences. Bulletin of the American Meteorological Society, 87: pp. 623-628. Accessed April 15, 2010.

Arctic Council. (2004). Arctic Climate Impact Assessment Report. Accessed March 22, 2007.

Balachandran, N., Rind, D., Lonergan, P., & Shindell, D. (1999). Effects of solar cycle variability on the lower stratosphere and the troposphere. Journal of Geophysical Research, 104(D22), 27, pp. 321-327, 339.

Bender, M. A., Knutson, T. R., Tuleya, R. E., Sirutis, J. J., Vecchi, G. A., Garner, S. T., and Held, I. M. (2010). Modeled Impact of Anthropogenic Warming on the Frequency of Intense Atlantic Hurricanes. Science, 327(5964), pp. 454-458.

Bonan, G. B. (2008). Forests and Climate Change: Forcings, Feedbacks, and the Climate Benefits of Forests. Science, 320(5882), pp. 1444-1449.

Cazenave, A. (2006). How fast are the ice sheets melting? Science, 314, pp. 1251-1252.

Clement, A.C., Burgman, R., Norris, J.R. (2009, July 24) Observational and model evidence for positive low-level cloud feedback. Science, 325 (5939), pp. 460-464.

Dessler, A., Zhang, Z., Yang, P. (2008, October 23). Water-vapor climate feedback inferred from climate fluctuations, 2003-2008. Geophysical Research Letters, 35, pp. L20704.

Emanuel, K. (2005). Increasing destructiveness of tropical cyclones over the past 30 years. Nature, 436, pp. 686-688.

Foucal, P., Frölich, C., Spruit, H., and Wigley, T. (2006). Variations in solar luminosity and their effect on the Earth's climate. Nature, 443, pp. 161-166.

Hansen, J., Sato, M., Ruedy, R., Kharecha, P., Lacis, A., Miller, R., Nazarenko, L., et al. (2007). Climate simulations for 1880–2003 with GISS model E. Climate Dynamics, 29(7), pp. 661-696.

Hansen, J., Nazarenko, L., Ruedy, R., Sato, M., Willis, J., Del Genio, A., Koch, D., Lacis, A., Lo, K., Menon, S., Novakov, T., Perlwitz, J., Russell, G., Schmidt, G.A., and Tausnev, N. (2005, June 3). Earth's energy imbalance: confirmation and implications. Science, 308, pp. 1431-1435.

Corresponding Author

Pardeep*

M. A. Geography (NET, JRF)

pardeepgoyat81@gmail.com