Global Warming and Its Cause and Effects: A Review

Sunil Kumar

maliksunil526@gmail.com

Abstract: **- Global Warming is the increase of Earth's average surface temperature due to effect of greenhouse gases, such as carbon dioxide emissions from burning fossil fuels or from deforestation, which trap heat that would otherwise escape from Earth. The problem of Global Warming can be controlled by minimizing the emission of greenhouse gases into the environment. The main cause for global warming is greenhouse gases. In specific terms, an increase of 1 or more degrees Celsius in a period of one hundred to two hundred years would be considered global warming. This is a type of greenhouse effect. In this paper we studied about Global Warming and its causes and effects.**

Keywords: **-Green House effect, Global Warming.**

I. INTRODUCTION

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 about two thirds of this increase has occurred since 1975. Today, the idea of global warming is well known, if not well understood. It is not unusual to hear someone complaining about a hot day or a freak storm and remark, "It's global warming. “Scientists from the Intergovernmental Panel on Climate carrying out global warming research have recently predicted that average global temperatures could increase between 1.4 and 5.8 °C by the year 2100. Scientific understanding of global warming is increasing. The Intergovernmental Panel on Climate Change (IPCC) reported in 2014 that scientists were more than 95% certain that global warming is mostly being caused by human (anthropogenic) activities, mainly increasing concentrations of greenhouse gases such as methane and carbon dioxide (CO2).

Public reactions to global warming and concern about its effects are also increasing. A global 2015 Pew Research Center report showed a median of 54% consider it "a very serious problem". There are significant regional differences, with Americans and Chinese (whose economies are responsible for the greatest annual CO2 emissions) among the least concerned.

In the United States, the burning of fossil fuels to make electricity is the largest source of heat-trapping pollution, producing about two billion tons of CO2 every year. Coal-burning power plants are by far the biggest polluters. The country’s second-largest source of carbon pollution is the transportation sector, which generates about 1.7 billion tons of CO2 emissions a year.

The effect of global warming on the climate of India has led to climate disasters as per some experts. India is a disaster prone area, with the statistics of 27 out of 35 states being disaster prone, with foods being the most frequent disasters. The process of global warming has led to an increase in the frequency and intensity of these climatic disasters.

According to the The Indira Gandhi Institute of Development Research, if the process of global warming continues to increase, resulting climatic disasters would cause a decrease in India’s GDP to decline by about 9%, with a decrease by 40% of the production of the major crops. A temperature increase of 2° C in India is projected to displace seven million people, with a submersion of the major cities of India like Mumbai and Chennai.

II. GREENHOUSE GASES

Greenhouse gases are a group of compounds that are able to trap heat (longwave radiation) in the atmosphere, keeping the Earth's surface warmer than it would be if they were not present. These gases are the fundamental cause of the greenhouse effect. Today's atmosphere contains 42 per cent more carbon dioxide than it did at the start of the industrial era. Levels of methane and carbon dioxide are the highest they have been in nearly half a million years. Many gases exhibit these “greenhouse” properties. Some of them occur in nature (water vapor, carbon dioxide, methane, and nitrous oxide), while others are exclusively human-made (like gases used for aerosols). Common examples of greenhouse gases, listed in order of abundance, include: water vapor, carbon dioxide, methane, nitrous oxide, ozone, and any fluorocarbons. Although water vapor is the most abundant greenhouse gas, it is a relatively ineffective one.

III. CAUSE OF GLOBAL WARMING:

The cause of global warming is the increasing quantity of greenhouse gases in the our atmosphere produced by human activities, like the burning of fossil fuels or deforestation. Deforestation and industrial emissions result to an increase greenhouse gases (such as carbon-dioxide) around earth’s atmosphere. Forest fires emit carbon-filled smoke into the atmosphere, and new forests’ growth is slow and not stable enough to produce the much needed oxygen into the newly, suffocating carbon air. Humans burn coal, oil and gas (fossil fuels) to generate electricity or drive our cars, carbon dioxide is released into the atmosphere, where it traps heat. The water vapor is unable to escape, and thus results in hotter climate changes. NASA continues to work on water vapor solutions to reduce their effect on global warming.

When forested land is cleared, soil disturbance and increased rates of decomposition in converted soils both create carbon

dioxide emissions. This also increases soil erosion and nutrient leaching which can further reduces the area's ability to act as a carbon sink.

Depletion of the ozone layer by chemical refrigerants has also resulted in a strong cooling effect in the stratosphere. If solar variations were responsible for observed warming, warming of both the troposphere and stratosphere would be expected.

During the last few thousand years, this phenomenon contributed to a slow cooling trend at high latitudes of the Northern Hemisphere during summer, a trend that was reversed by greenhouse-gas-induced warming during the 20th century.

The influences of atmospheric particles, including black carbon, are most pronounced in the tropics and sub-tropics, particularly in Asia, while the effects of greenhouse gases are dominant in the extratropics and southern hemisphere.

IV. EFFECT OF GLOBAL WARMING

Global warming is damaging the Earth's climate as well as the physical environment. Desertification, Stronger hurricanes and cyclones, Increased melting of snow and ice, Sea level rise effect on Human Health these are the effect of Global Warming.

One major consequence of global warming arising out of greenhouse effect is the rise in sea level. Four major changes take place prior to this. According to IPCC 2007 report, sea levels will rise by 7-23 inches by the end of this century due to global warming. There has been a tremendous increase of water vapor, carbon dioxide, methane nitrous oxide and especially greenhouse gases due to polluting substances emitted as a result of industrialization, pollution, deforestation. It has been estimated that we are already committed to a sea-level rise of approximately 2.3 metres for each degree of temperature rise within the next 2,000 years. Warming beyond the 2 °C target would potentially lead to rates of sea-level rise dominated by ice loss from Antarctica. Continued CO2 emissions from fossil sources could cause additional tens of metres of sea level rise, over the next millennia and eventually ultimately eliminate the entire Antarctic ice sheet, causing about 58 metres of sea level rise. Melting glaciers, early snowmelt, and severe droughts will cause more dramatic water shortages and increase the risk of wildfires in the American West.

The enormous (900 mile long) Aleution island ecosystems of orcas (killer whales), sea lions, sea otters, sea urchins, kelp beds, and fish populations, appears to have collapsed due to loss of plankton, leading to loss of sea lions, leading orcas to eat too many sea otters, leading to urchin explosions, leading to loss of kelp beds and their associated fish populations.

Global warming is causing climate change. The world's is becoming warmer and warmer. There is also prediction of regional climate changes along the ecosystem. Increasing temperatures will release more greenhouse gases, unlock methane, and cause more evaporation of water.

According to researches, unabated global warming will lead to exacerbation of the droughts, cutting down the water availability in the plains of Pradesh and Bihar. India's initial National Communication to the United Nations Framework Convention (UNFCCC) on Climate Change projects that Luni; the west flowing rivers of Kutchh and Saurashtra are likely to experience acute physical water scarcity. The river basins of Mahi, Pennar, Sabarmati and Tapi are also likely to experience constant water scarcities and shortages.

V. CONCLUSION

Warming is expected to be greater over land than over the oceans and greatest in the Arctic, with the continuing retreat of glaciers, permafrost and sea ice. Other likely changes include more frequent extreme weather events including heat waves, droughts, heavy rainfall with floods and heavy snowfall; ocean acidification; and species extinctions due to shifting temperature regimes. Global warming refers to an increase in the concentration of greenhouse gases on the Earth's surface causing viral climate change. Climate change is very likely having an impact now on our planet and its life. Human activities have led to carbon dioxide concentrations above levels not seen in hundreds of thousands of years. Currently, about half of the carbon dioxide released from the burning of fossil fuels remains in the atmosphere. Above we see that global warming effect the environment and human .

REFERENCES

[1]. "Global temperatures." U.K. Met Office. http://www.metoffice.gov.uk/climate-change/guide/science/monitoring/global (accessed August 13, 2014).

[2]. Hansen, J., R. Ruedy, M. Sato, and K. Lo. "Global Surface Temperature Change." Reviews of Geophysics 48, no. 4 (2010): RG4004.

[3]. Stokes, Bruce; Wike, Richard; Carle, Jill (5 November 2015). "Global Concern about Climate Change, Broad Support for Limiting Emissions: U.S., China Less Worried; Partisan Divides in Key Countries". Pew Research Center. Retrieved 18 June 2016.

[4]. Cause And Effects Of Global Warming http://essayssos.com/blog/cause-and-effects-of-global-warming-global-warming-research-paper.html

[5]. "CLIMATE CHANGE 2014: Synthesis Report. Summary for Policymakers" (PDF). IPCC. Retrieved 1 November 2015. The following terms have been used to indicate the assessed likelihood of an outcome or a result: virtually certain 99–100% probability, very likely 90–100%, likely 66–100%, about as likely as not 33–66%, unlikely 0–33%, very unlikely 0–10%, exceptionally unlikely 0–1%. Additional terms (extremely likely: 95–100%, more likely than not >50–100%, more unlikely than likely 0–<50% and extremely unlikely 0–5%) may also be used when appropriate.

[6]. Houghton, R. A.. "How well do we know the flux of CO2 from land-use change?." Tellus B 62, no. 5 (2010): 337-351.

[7]. "CLIMATE CHANGE 2014: Synthesis Report. Summary for Policymakers" (PDF). IPCC. Retrieved 7 March 2015. The evidence for human influence on the climate system has grown since the Fourth Assessment Report (AR4). It is extremely likely that more than half of the observed increase in global average surface temperature from 1951 to 2010 was caused by the

anthropogenic increase in greenhouse gas concentrations and other anthropogenic forcings together
[8]. Allison, Ian. The science of climate change: questions and answers. Canberra: Australian Academy of Science, 2010.
[9]. Le Treut, H., R. Somerville, U. Cubasch, Y. Ding, C. Mauritzen, A. Mokssit, T. Peterson and M. Prather. Historical Overview of Climate Change. In: Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 2007.
[10]. America's Climate Choices: Panel on Advancing the Science of Climate Change; National Research Council (2010). Advancing the Science of Climate Change. Washington, D.C.: The National Academies Press. ISBN 0-309-14588-0. (p1) ... there is a strong, credible body of evidence, based on multiple lines of research, documenting that climate is changing and that these changes are in large part caused by human activities. While much remains to be learned, the core phenomenon, scientific questions, and hypotheses have been examined thoroughly and have stood firm in the face of serious scientific debate and careful evaluation of alternative explanations. * * * (p21-22) Some scientific conclusions or theories have been so thoroughly examined and tested, and supported by so many independent observations and results, that their likelihood of subsequently being found to be wrong is vanishingly small. Such conclusions and theories are then regarded as settled facts. This is the case for the conclusions that the Earth system is warming and that much of this warming is very likely due to human activities.
[11]. USGCRP 2009, p. 20
[12]. Global Warming 101by Amanda MacMillan https://www.nrdc.org/stories/global-warming-101
[13]. BOX SYN-1: SUSTAINED WARMING COULD LEAD TO SEVERE IMPACTS, p.5, in: Synopsis, in National Research Council 2011
[14]. What Is Global Warming? By Alina Bradford http://www.livescience.com/37003-global-warming.html
[15]. How Global Warming Works by Jonathan Strickland & Ed Grabianowski http://science.howstuffworks.com/environmental/green-science/global-warming.htm
[16]. 35 Surprising Facts About Global Warming http://www.conserve-energy-future.com/various-global-warming-facts.php
[17]. Anders Levermann; Peter U. Clark; Ben Marzeion; Glenn A. Milne; David Pollard; Valentina Radic; Alexander Robinson (13 June 2013). "The multimillennial sea-level commitment of global warming". PNAS. 110: 13745–13750.
[18]. IPCC. Summary for Policymakers. In: *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 2007.
[19]. Kaufman, D. S.; Schneider, D. P.; McKay, N. P.; Ammann, C. M.; Bradley, R. S.; Briffa, K. R.; Miller, G. H.; Otto-Bliesner, B. L.; Overpeck, J. T.; Vinther, B. M.; Abbott, M.; Axford, M.; Bird, Y.; Birks, B.; Bjune, H. J. B.; Briner, A. E.; Cook, J.; Chipman, T.; Francus, M.; Gajewski, P.; Geirsdottir, K.; Hu, A.; Kutchko, F. S.; Lamoureux, B.; Loso, S.; MacDonald, M.; Peros, G.; Porinchu, M.; Schiff, D.; Seppa, C.; Seppa, H.; Arctic Lakes 2k Project Members (2009). "Recent Warming Reverses Long-Term Arctic Cooling". Science. 325 (5945): 1236–1239. Bibcode:2009Sci...325.1236K. doi:10.1126/science.1173983. PMID 19729653.
[20]. Global Warming: News, Facts, Causes & Effects http://www.livescience.com/topics/global-warming
[21]. Ramanathan, V.; et al. (2008). "Part III: Global and Future Implications" . Atmospheric Brown Clouds: Regional Assessment Report with Focus on Asia. United Nations Environment Programme.
[22]. Essay on Global Warming: Causes, Effects, Impact and Prevention of Global Warming On August 7, 2015 By Rahul Kakkar "Arctic Warming Overtakes 2,000 Years of Natural Cooling". UCAR. 3 September 2009. Retrieved 8 June 2011. http://www.importantindia.com/11701/essay-on-global-warming/
[23]. http://www.nmsea.org/Curriculum/Primer/Global_Warming/fossil_fuels_and_global_warming.htm
[24]. Bello, David (4 September 2009). "Global Warming Reverses Long-Term Arctic Cooling". Scientific American. Retrieved 8 June 2011.
[25]. Causes of Global Warming http://www.conserve-energy-future.com/globalwarmingcauses.php
[26]. Anisah Sajidah binti Haji Saud "Global warming and its impacts on climate of India" http://greencleanguide.com/global-warming-and-its-impacts-on-climate-of-india/
[27]. What Is Global Warming? http://www.nationalgeographic.com/environment/global-warming/global-warming-overview/
[28]. Mann, M. E.; Zhang, Z.; Hughes, M. K.; Bradley, R. S.; Miller, S. K.; Rutherford, S.; Ni, F. (2008). "Proxy-based reconstructions of hemispheric and global surface temperature variations over the past two millennia". Proceedings of the National Academy of Sciences. 105 (36): 13252–7. Bibcode:2008PNAS..10513252M. doi:10.1073/pnas.0805721105. PMC 2527990Freely accessible. PMID 18765811.
[29]. What is global warming? http://whatsyourimpact.org/global-warming
[30]. http://whatis.techtarget.com/definition/greenhouse-gas
[31]. Greenhouse Gases, Climate Change, and Energy http://www.eia.gov/oiaf/1605/ggccebro/chapter1.html
[32]. Greenhouse gases http://davidsuzuki.org/issues/climate-change/science/climate-change-basics/greenhouse-gases/
[33]. How do we know that humans are the major cause of global warming? http://www.ucsusa.org/global_warming/science_and_impacts/science/global-warming-faq.html#.WI3pm_k2vIU
[34]. https://en.wikipedia.org/wiki/Global_warming
[35]. On snowfall:
Christopher Joyce (15 February 2010). "Get This: Warming Planet Can Mean More Snow". NPR.
"Global warming means more snowstorms: scientists". 1 March 2011.
"Does record snowfall disprove global warming?". 9 July 2010. Retrieved 14 December 2014.
[36]. Buis, Alan; Ramsayer, Kate; Rasmussen, Carol (12 November 2015). "A Breathing Planet, Off Balance". *NASA*. Retrieved 13 November 2015.