



Next Pandemic- Climate Change?

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Abstract:

The corona pandemic yet is not over and the world is facing difficulties since last two years. The man considered the supremacy of the technology but the corona has done the great damage so it's time to think that what could be the next pandemic? After industrial revolution, the man had negative impact on the environment. There are very less efforts for the protection of the environment. The increase in the carbon dioxide emission has caused the global warming. The global warming has created number of climate changes e.g. melting of glaciers, increase in the sea level, increase in the average global temperature etc. Hence the topic in the discussion should be the -Next Pandemic- Climate Change?

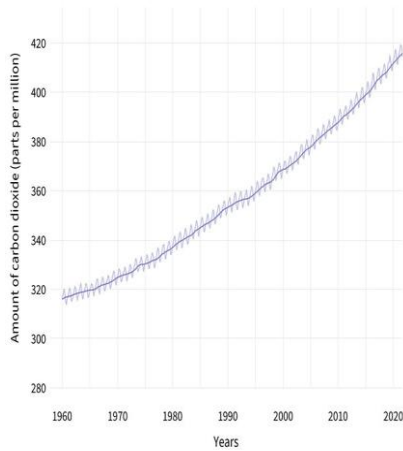
Key words: *Carbon Dioxide, Climate Change, Global Warming, Greenhouse Effect, Pandemic*

1. Introduction

The world has seen many pandemic in the history like plague, cholera, flu and the ongoing covid-19 or corona pandemic. Majority of these pandemics are due to the natural reasons like viruses, bacteria etc. But the reason for the next pandemic could be the man. The man made activities like emission of the carbon dioxide due to combustion of the fossil fuel, power plants etc can bring the next pandemic like climate change.

2. Greenhouse gases /CO2 emission

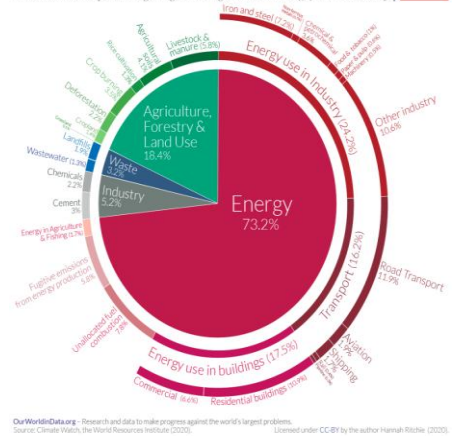
ATMOSPHERIC CARBON DIOXIDE (1960-2021)



Source- National Oceanic and Atmospheric Administration

Fig.1. Atmospheric CO₂

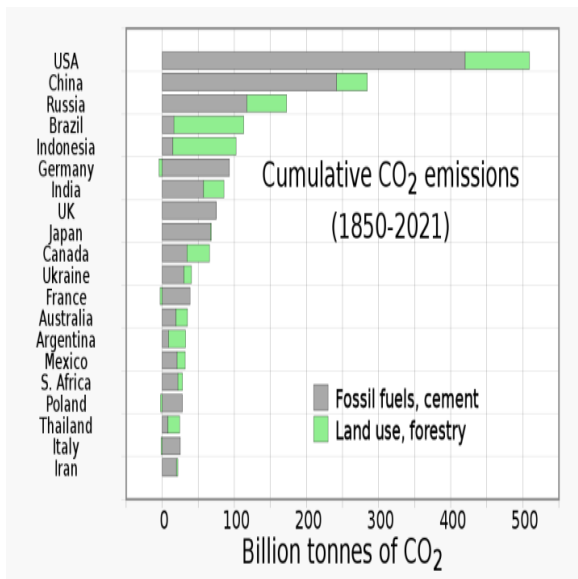
Global greenhouse gas emissions by sector



Source- <https://ourworldindata.org/>

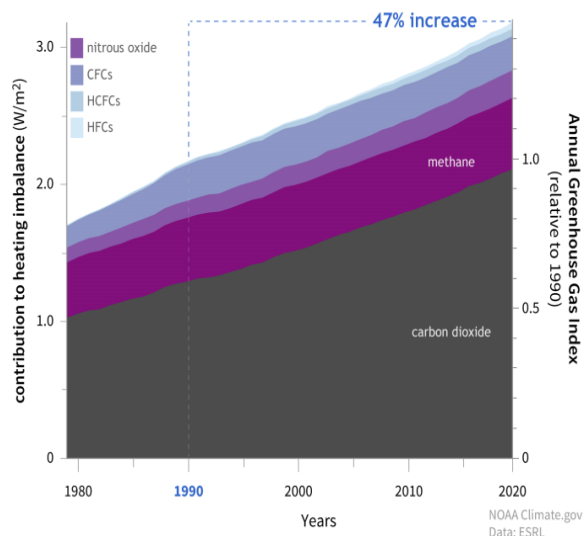
Fig.2.Greenhouse Gas Emission By Sector

The primary greenhouse gases in Earth's atmosphere are water vapor (H₂O), methane (CH₄), nitrous oxide (N₂O), and ozone (O₃) but the main is carbon dioxide (CO₂).The Greenhouse gases or CO₂ emission is due to nature as well as due to manmade activities.[1] [2]The manmade activities have a larger impact on CO₂ emission. The major activities which are the main sources of CO₂ emission are the coal – power plants, fuel combustion activities, industrial processes like manufacturing of steel, cement, etc.[3]



Source- Wikimedia Commons

COMBINED HEATING INFLUENCE

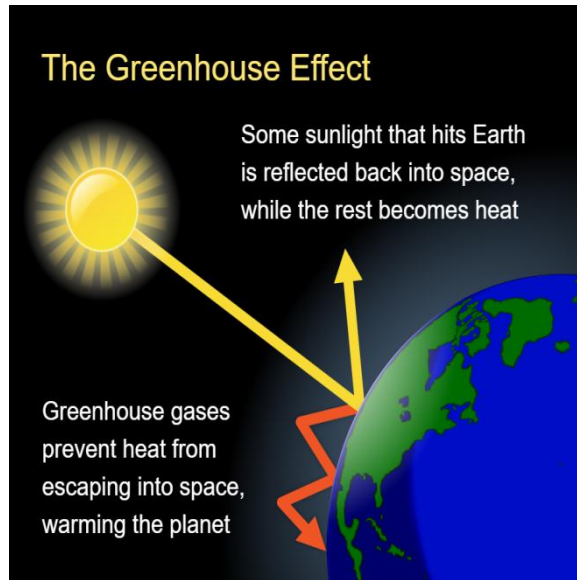


Source- National Oceanic and Atmospheric Administration

Fig.3.CO2 Emission By Countries

Fig.4. Greenhouse Heating Influence

3. Greenhouse effect



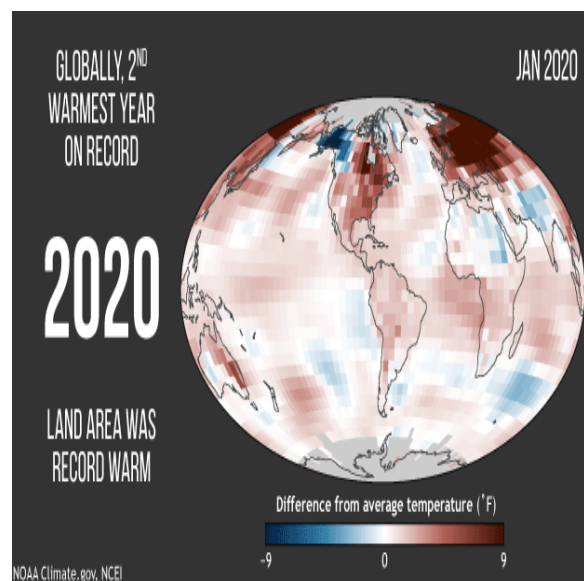
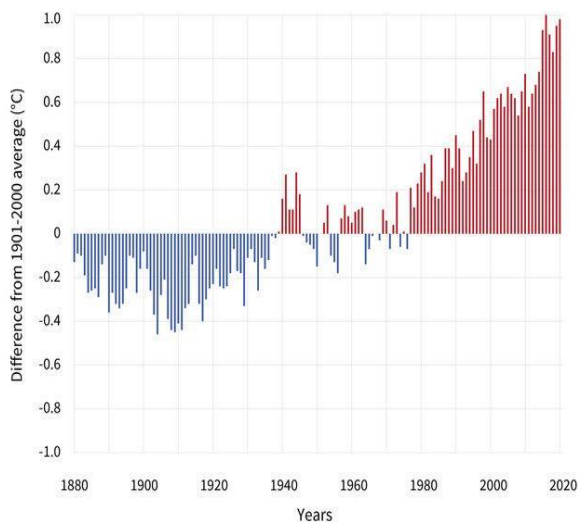
Source- https://en.wikipedia.org/wiki/Greenhouse_effect

Fig.5.Greenhouse Effect

The sunlight comes in contact with the earth and the earth gets heated. This heat cannot go in to the space because of the atmosphere of the earth. Therefore the earth remains warm and suitable for the survival. The atmosphere contains greenhouse gases like carbon dioxide, which absorbs the heat from the earth and cannot allow the heat to pass into space. This is called the greenhouse effect.

4. Global warming

GLOBAL AVERAGE SURFACE TEMPERATURE



Source- National Oceanic and Atmospheric

Source- National Oceanic and Atmospheric

Administration

Fig.6.Global Average Surface Temperature

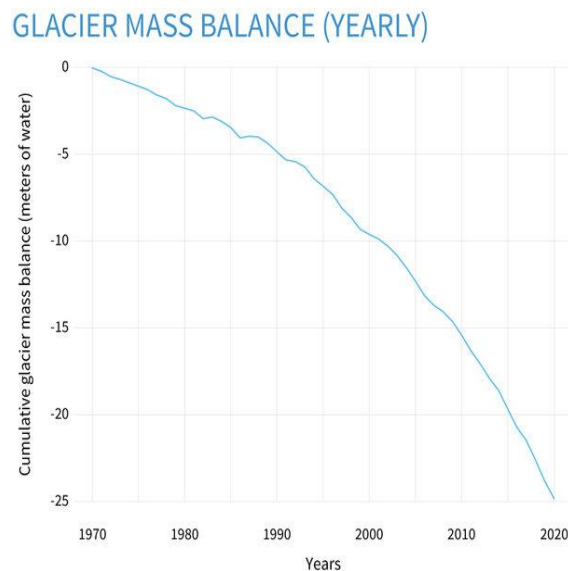
Administration

Fig.7.Globally Warmest Years

The years 2016 and 2020 are one of the warmest years on the planet. The earth's temperature rise rate was (0.08° C) per decade since 1880 but it has been increased in past 40 years to (0.18° C) per decade since 1981. The average temperature of the earth has increased by around 1° C in the last century.

5. Climate Change

The extra heat absorption by the greenhouse gases of the earth increasing the temperature of the earth very rapidly. Due to which there are changes taking place in the earth's normal pattern of the climate. e.g. Temperature extremes, melting of ice glaceries, increasing the sea level, etc.[4][5][6][7]

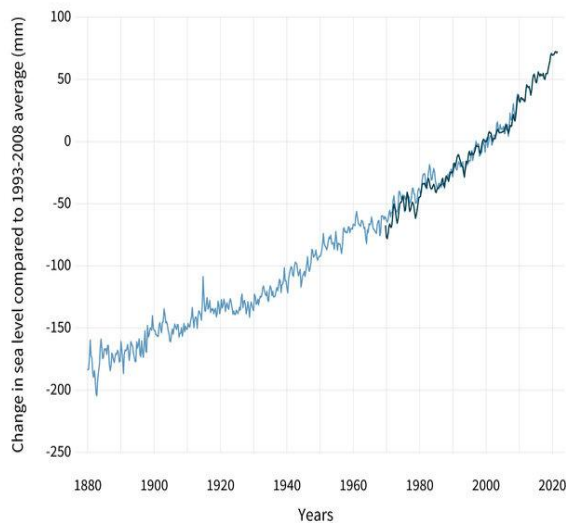


Source- <https://www.climate.gov/maps-data>

Fig.8.Glacier Mass Balance

The most glaciers in the world are shrinking and in some cases have be disappeared. This melting of ice from the glaciers has caused the sea level rise. The rate of sea level rise is continuously increasing in recent decades. The glaciers are the main sources of water in the summer season in many parts of the world. Millions of the people are depending upon the glaciers for the water along with the natural eco-system. The high melting rate of glaciers is threat for the future water availability.[8]

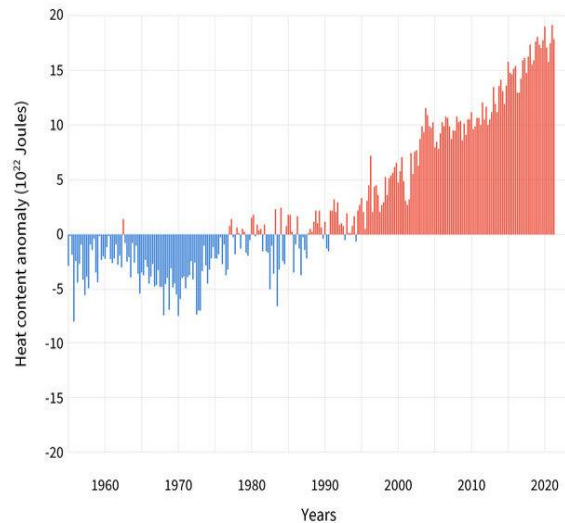
GLOBAL SEA LEVEL



Source- <https://www.climate.gov/media/14135>

Fig.9.Global Sea Level

OCEAN HEAT COMPARED TO AVERAGE



Source- <https://www.climate.gov/media/13603>

Fig.10.Ocean Heat

The sea level has been continuously increasing since last two centuries. The sea level has been increased by –9 inches (21–24 centimeters) since 1880. A new record high—91.3 mm (3.6 inches) above 1993 levels has been observed in the global sea level in the year 2020. If we follow the lower greenhouse emission, still the global sea level can be risen by 12 inches by the year 2100. If we continue the high emission of the carbon dioxide then the global sea level can be risen by 2.5 meters by the year 2100 as compared to the level of the year 2000. The rise in the sea level cause the high tide flooding more frequently. The coast line has the number of cities globally and the raise in the sea level can sink the parts of the cities. This is the series impact on the economy as well as on the life of the peoples.[9]

The ocean temperature is increasing continuously which has the larger impact on the marine ecosystem. This is also the threat to the economy.[10]

6. Conclusion

The carbon dioxide emission is increasing due to the human activities like combustion of the fuel and many more activities. This is the main reason for the global warming and the climate change. This can be avoid by reducing the emission of carbon dioxide that by searching the alternative technology. Till then we have the best option of photosynthesis. That is the plantation of the tree. The trees are the main and natural remedies for the reduction in the carbon dioxide in the atmosphere. The education about the environment needs to increase among the people. Also the government should spend more time and money for the tree plantation.



References:

- 1) CO₂ capture by metal organic frameworks-S. B. Kapure, Heena Meroliya, Sharda Gadale & Shobha. A. Waghmode- *Research & Reviews in Biotechnology & Biosciences-Volume: 8, Issue: 2, Year: 2021*
- 2) CLIMATE CHANGE: ATMOSPHERIC CARBON DIOXIDE - By Rebecca Lindsey - *August 14, 2020*
- 3) Preparation, characterization and performance of activated carbon for CO₂ adsorption from CI engine exhaust - R. Maniarasu, Sushil Kumar Rathore, S. Murugan- *08 March 2022- greenhouse gases-science and technology*
- 4) Anthropogenic emissions and urbanization increase risk of compound hot extremes in cities- - Jun Wang, Yang Chen, Weilin Liao, Guan hao He, Simon F. B. Tett, Zhongwei Yan, Panmao Zhai, Jinming Feng, Wenjun Ma, Cunrui Huang & Yamin Hu- *Nature Climate Change volume 11, pages1084–1089 (2021)*
- 5) Relationships between climate change perceptions and climate adaptation actions: policy support, information seeking, and behavior-A. M. van Valkengoed, G. Perlaviciute, L. Steg- *1 March 2021-Climatic Change (2022) 171:14*
- 6) IPCC Special Report on Carbon dioxide Capture and Storage-John Gale-
- 7) Precipitation trends determine future occurrences of compound hot–dry events -Emanuele Bevacqua , Giuseppe Zappa , Flavio Lehner and Jakob Zscheischler-*Nature Climate Change (2022)*
- 8) Mass Balance Status of Indian Himalayan Glaciers: A Brief Review- Shruti Singh, Rajesh Kumar and A. P. Dimri- *Front. Environ. Sci., 21 August 2018*
- 9) Sea-level rise caused by climate change and its implications for society- Nobuo MIMURA- *Proc Jpn Acad Ser B Phys Biol Sci v.89(7); 2013 Jul 25*
- 10) Another Record: Ocean Warming Continues through 2021 despite La Niña Conditions- Lijing Cheng, John Abraham, Kevin E. Trenberth, John Fasullo, Tim Boyer, Michael E. Mann, Jiang Zhu, Fan Wang, Ricardo Locarnini, Yuanlong Li, Bin Zhang, Zhetao Tan, Fujiang Yu, Liying Wan, Xingrong Chen, Xiangzhou Song, Yulong Liu, Franco Reseghetti, Simona Simoncelli, Viktor Gouretski, Gengxin Chen, Alexey Mishonov & Jim Reagan- *Advances in Atmospheric Sciences volume 39, pages373–385 (2022)*