ISSN: 2395-7852

International Journal of Advanced Research in Arts, Science, Engineering & Management

Volume 10, Issue 5, September 2023

INTERNATIONAL STANDARD SERIAL NUMBER INDIA

Impact Factor: 6.551

+91 9940572462 +91 9940572462 ijarasem@gmail.com www.ijarasem.com

International Journal of Advanced Research in Arts, Science, Engineering & Management (IJARASEM)

| ISSN: 2395-7852 | www.ijarasem.com | Impact Factor: 6.551 | Bimonthly, Peer Reviewed & Referred Journal|

| Volume 10, Issue 5, September 2023 |

Climate Change-A Geographical Study

PROFESSOR USHA

Department of Geography, Government Dungar College, Bikaner, Rajasthan, India

ABSTRACT

Climate change refers to long-term shifts in temperatures and weather patterns. Such shifts can be natural, due to changes in the sun's activity or large volcanic eruptions. But since the 1800s, human activities have been the main driver of climate change, primarily due to the burning of fossil fuels like coal, oil and gas.

Burning fossil fuels generates greenhouse gas emissions that act like a blanket wrapped around the Earth, trapping the sun's heat and raising temperatures.

The main greenhouse gases that are causing climate change include carbon dioxide and methane. These come from using gasoline for driving a car or coal for heating a building, for example. Clearing land and cutting down forests can also release carbon dioxide. Agriculture, oil and gas operations are major sources of methane emissions. Energy, industry, transport, buildings, agriculture and land use are among the main sectors causing greenhouse gases.

KEYWORDS-climate,change,greenhouse,gases,temperatures,CO2,methane,emissions

I. INTRODUCTION

Climate scientists have showed that humans are responsible for virtually all global heating over the last 200 years. Human activities like the ones mentioned above are causing greenhouse gases that are warming the world faster than at any time in at least the last two thousand years.[1,2]

The average temperature of the Earth's surface is now about 1.1°C warmer than it was in the late 1800s (before the industrial revolution) and warmer than at any time in the last 100,000 years. The last decade (2011-2020) was the warmest on record, and each of the last four decades has been warmer than any previous decade since 1850.

Many people think climate change mainly means warmer temperatures. But temperature rise is only the beginning of the story. Because the Earth is a system, where everything is connected, changes in one area can influence changes in all others.

The consequences of climate change now include, among others, intense droughts, water scarcity, severe fires, rising sea levels, flooding, melting polar ice, catastrophic storms and declining biodiversity.

People are experiencing climate change in diverse ways

Climate change can affect our health, ability to grow food, housing, safety and work. Some of us are already more vulnerable to climate impacts, such as people living in small island nations and other developing countries. Conditions like sea-level rise and saltwater intrusion have advanced to the point where whole communities have had to relocate, and protracted droughts are putting people at risk of famine. In the future, the number of "climate refugees" is expected to rise.

Every increase in global warming matters

In a series of UN reports, thousands of scientists and government reviewers agreed that limiting global temperature rise to no more than 1.5°C would help us avoid the worst climate impacts and maintain a livable climate. Yet policies currently in place point to a 2.8°C temperature rise by the end of the century.

The emissions that cause climate change come from every part of the world and affect everyone, but some countries produce much more than others.The seven biggest emitters alone (China, the United States of America, India, the European Union, Indonesia, the Russian Federation, and Brazil) accounted for about half of all global greenhouse gas emissions in 2020.[3,5]

Everyone must take climate action, but people and countries creating more of the problem have a greater responsibility to act first.

We face a huge challenge but already know many solutions

Many climate change solutions can deliver economic benefits while improving our lives and protecting the environment. We also have global frameworks and agreements to guide progress, such as the Sustainable Development Goals, the UN Framework Convention on Climate Change and the Paris Agreement. Three broad categories of action are: cutting emissions, adapting to climate impacts and financing required adjustments.

Switching energy systems from fossil fuels to renewables like solar or wind will reduce the emissions driving climate change. But we have to act now. While a growing number of countries is committing to net zero emissions by 2050, emissions must be cut in half by 2030 to keep warming below 1.5°C. Achieving this means huge declines in the use of coal, oil and gas: over two-thirds of today's proven reserves of fossil fuels need to be kept in the ground by 2050 in order to prevent catastrophic levels of climate change.[7,8]

Adapting to climate consequences protects people, homes, businesses, livelihoods, infrastructure and natural ecosystems. It covers current impacts and those likely in the future. Adaptation will be required everywhere, but must be prioritized now for the most vulnerable people with the fewest resources to cope with climate hazards. The rate of return can be high. Early warning systems for disasters, for instance, save lives and property, and can deliver benefits up to 10 times the initial cost.

We can pay the bill now, or pay dearly in the future

Climate action requires significant financial investments by governments and businesses. But climate inaction is vastly more expensive. One critical step is for industrialized countries to fulfil their commitment to provide $100 billion a year to developing countries so they can adapt and move towards greener economies.

II. DISCUSSION

Some changes (such as droughts, wildfires, and extreme rainfall) are happening faster than scientists previously assessed. In fact, according to the Intergovernmental Panel on Climate Change (IPCC) — the United Nations body established to assess the science related to climate change — modern humans have never before seen the observed changes in our global climate, and some of these changes are irreversible over the next hundreds to thousands of years.

Scientists have high confidence that global temperatures will continue to rise for many decades, mainly due to greenhouse gases produced by human activities.

A Degree of Difference

So, the Earth's average temperature has increased about 2 degrees Fahrenheit during the 20th century. What's the big deal?[9,10]

The IPCC's Sixth Assessment report, published in 2021, found that human emissions of heat-trapping gases have already warmed the climate by nearly 2 degrees Fahrenheit (1.1 degrees Celsius) since 1850-1900.[1] The global average temperature is expected to reach or exceed 1.5 degrees C (about 3 degrees F) within the next few decades. These changes will affect all regions of Earth.
What's the difference between climate change and global warming?

The severity of effects caused by climate change will depend on the path of future human activities. More greenhouse gas emissions will lead to more climate extremes and widespread damaging effects across our planet. However, those future effects depend on the total amount of carbon dioxide we emit. So, if we can reduce emissions, we may avoid some of the worst effects.

"The scientific evidence is unequivocal: climate change is a threat to human wellbeing and the health of the planet. Any further delay in concerted global action will miss the brief, rapidly closing window to secure a liveable future."[11,12]

| ISSN: 2395-7852 | www.ijarasem.com | Impact Factor: 6.551 | Bimonthly, Peer Reviewed & Referred Journal|

| Volume 10, Issue 5, September 2023 |

III. RESULTS

Climate change is the single biggest health threat facing humanity, and health professionals worldwide are already responding to the health harms caused by this unfolding crisis.

The Intergovernmental Panel on Climate Change (IPCC) has concluded that to avert catastrophic health impacts and prevent millions of climate change-related deaths, the world must limit temperature rise to 1.5°C. Past emissions have already made a certain level of global temperature rise and other changes to the climate inevitable. Global heating of even 1.5°C is not considered safe, however; every additional tenth of a degree of warming will take a serious toll on people's lives and health.

While no one is safe from these risks, the people whose health is being harmed first and worst by the climate crisis are the people who contribute least to its causes, and who are least able to protect themselves and their families against it - people in low-income and disadvantaged countries and communities.[13,15]

The climate crisis threatens to undo the last fifty years of progress in development, global health, and poverty reduction, and to further widen existing health inequalities between and within populations. It severely jeopardizes the realization of universal health coverage (UHC) in various ways – including by compounding the existing burden of disease and by exacerbating existing barriers to accessing health services, often at the times when they are most needed. Over 930 million people - around 12% of the world's population - spend at least 10% of their household budget to pay for health care. With the poorest people largely uninsured, health shocks and stresses already currently push around 100 million people into poverty every year, with the impacts of climate change worsening this trend.

Climate-sensitive health risks

Climate change is already impacting health in a myriad of ways, including by leading to death and illness from increasingly frequent extreme weather events, such as heatwaves, storms and floods, the disruption of food systems, increases in zoonoses and food-, water- and vector-borne diseases, and mental health issues. Furthermore, climate change is undermining many of the social determinants for good health, such as livelihoods, equality and access to health care and social support structures. These climate-sensitive health risks are disproportionately felt by the most vulnerable and disadvantaged, including women, children, ethnic minorities, poor communities, migrants or displaced persons, older populations, and those with underlying health conditions.[17,18]

Figure: An overview of climate-sensitive health risks, their exposure pathways and vulnerability factors. Climate change impacts health both directly and indirectly, and is strongly mediated by environmental, social and public health determinants.

Although it is unequivocal that climate change affects human health, it remains challenging to accurately estimate the scale and impact of many climate-sensitive health risks. However, scientific advances progressively allow us to attribute an increase in morbidity and mortality to human-induced warming, and more accurately determine the risks and scale of these health threats.

In the short- to medium-term, the health impacts of climate change will be determined mainly by the vulnerability of populations, their resilience to the current rate of climate change and the extent and pace of adaptation. In the longer-term, the effects will increasingly depend on the extent to which transformational action is taken now to reduce emissions and avoid the breaching of dangerous temperature thresholds and potential irreversible tipping points.

IV. CONCLUSION

To adequately address the climate crisis we must urgently reduce carbon pollution and prepare for the consequences of global warming, which the world is already experiencing. Combining global outreach with local expertise, WWF:

- helps people and nature adapt to a changing climate
- advances policies to fight climate change
- combats deforestation

- engages with businesses to reduce carbon emissions
- challenges U.S. cities to prepare for more extreme weather

ADAPTING TO CLIMATE CHANGE

To avoid the worst effects of climate change, we need to dramatically reduce global carbon emissions. But we must also prepare for the significant and unavoidable consequences of carbon emissions such as increasing temperatures, shifting precipitaton patterns, ocean acidification, sea level rise and the increasing intensity and frequency of extreme weather events. WWF works with local communities, governments and others around the world to help nature and people prepare for the many impacts of a changing climate. To do this we:

- Increase resilience of communities in Nepal by promoting new farming techniques, community weather monitoring and creating seed banks
- Restore beach vegetation to shade marine turtle nests in the Caribbean
- Secure access to fresh water for elephants in Thailand during periods of drought
- Identify areas where polar bears can live on solid Arctic sea ice for decades to come[19,20]

PROTECTING FORESTS

Forests are home to many of the world's most endangered wildlife. They also protect the planet by absorbing carbon dioxide (CO2), a major source of pollution that causes climate change. WWF fights climate change by saving forests. To do this we:

- Ensure that global climate change agreements reduce forest destruction and degradation and protect wildlife[21,22]
- Work directly with countries, especially developing ones, to protect forests and benefit the livelihoods of local communities
- Use satellite images and aerial mapping technologies to track illegal logging
- Study the vulnerability of forests to climate change and explore ways to help them adapt

INFLUENCING POLICY

Government must play a central role to tackle the climate crisis. WWF is an advocate at all levels of government. In the United States, WWF works to advance policies that reduce carbon pollution, support clean energy technologies, prepare for the effects of climate change, and curb deforestation. At international negotiations, WWF encourages the United States to play a constructive role in developing global climate agreements that:[23,25]

- Substantially reduce carbon pollution to avoid the worst consequences of climate change
- Provide financial support to developing countries so people and nature can successfully adapt
- Combat forest destruction and protect wildlife that live there
- Help transition developing countries to clean energy sources like wind and solar

ENGAGING BUSINESS

Businesses have a responsibility to reduce their contribution to climate change. WWF works in partnership with companies as part of WWF's Climate Savers Program to set and meet goals to reduce carbon emissions, advance projects to protect their resources from climate impacts, and ensure the sustainability of their core business.[26]

REFERENCES

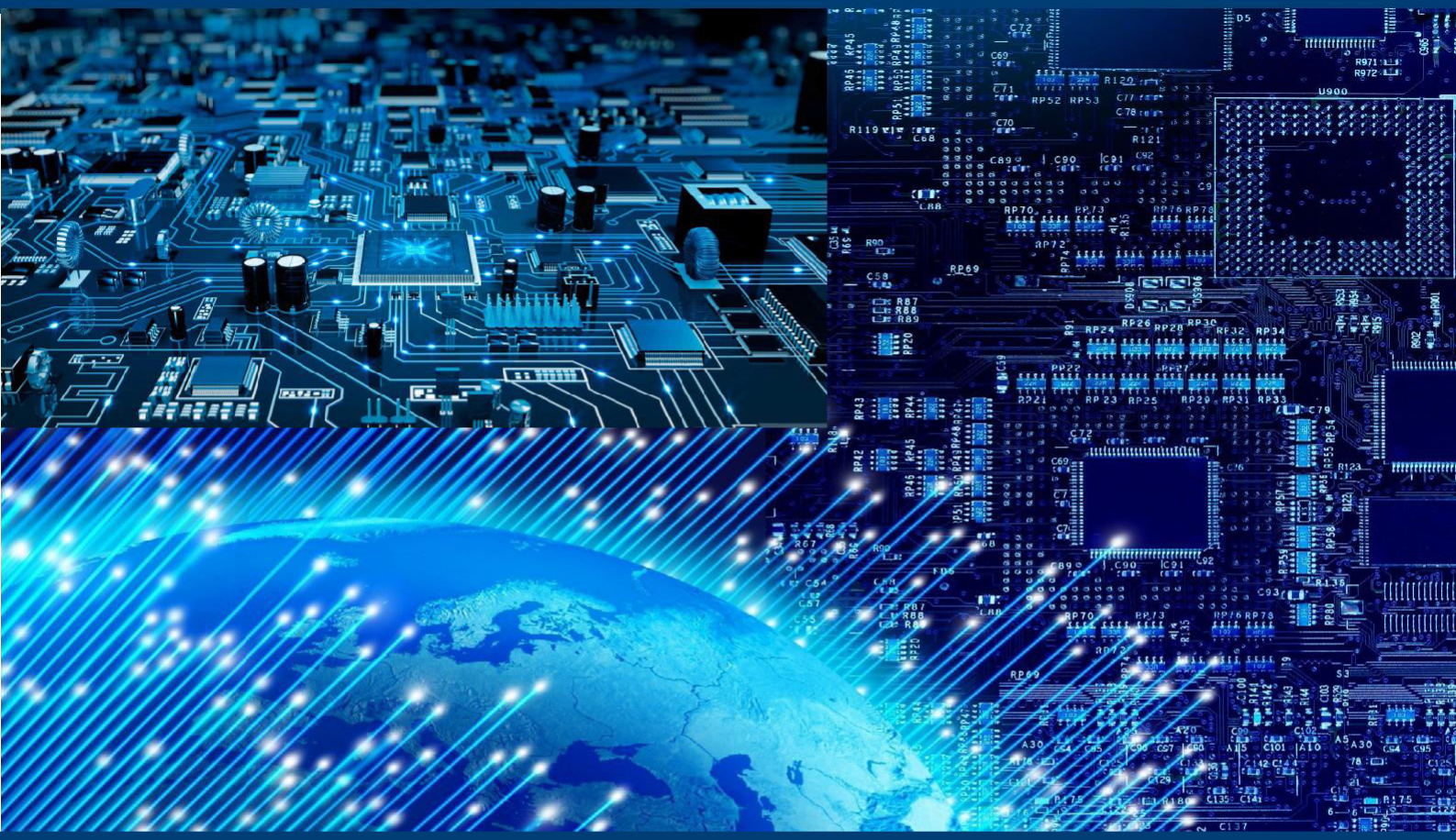
1) Albrecht, Bruce A. (1989). "Aerosols, Cloud Microphysics, and Fractional Cloudiness". Science. 245 (4923): 1227–
1239. Bibcode:1989Sci...245.1227A. doi:10.1126/science.245.4923.1227. PMID 17747885. S2CID 46152332.
2) Balsari, S.; Dresser, C.; Leaning, J. (2020). "Climate Change, Migration, and Civil Strife". Curr Environ Health Rep. 7 (4): 404–414. doi:10.1007/s40572-020-00291-4. PMC 7550406. PMID 33048318.
3) Bamber, Jonathan L.; Oppenheimer, Michael; Kopp, Robert E.; Aspinall, Willy P.; Cooke, Roger M. (2019). "Ice sheet contributions to future sea-level rise from structured expert judgment". Proceedings of the National Academy of Sciences. 116 (23): 11195–

11200. Bibcode:2019PNAS..11611195B. doi:10.1073/pnas.1817205116. ISSN 0027-8424. PMC 6561295. PMID 31110015.

4) Bednar, Johannes; Obersteiner, Michael; Wagner, Fabian (2019). "On the financial viability of negative emissions". Nature Communications. 10 (1): 1783. Bibcode:2019NatCo..10.1783B. doi:10.1038/s41467-019-09782-x. ISSN 2041-1723. PMC 6467865. PMID 30992434.
5) Berrill, P.; Arvesen, A.; Scholz, Y.; Gils, H. C.; et al. (2016). "Environmental impacts of high penetration renewable energy scenarios for Europe". Environmental Research Letters. 11 (1): 014012. Bibcode:2016ERL....11a4012B. doi:10.1088/1748-9326/11/1/014012.
6) Björnberg, Karin Edvardsson; Karlsson, Mikael; Gilek, Michael; Hansson, Sven Ove (2017). "Climate and environmental science denial: A review of the scientific literature published in 1990–2015". Journal of Cleaner Production. 167: 229–241. doi:10.1016/j.jclepro.2017.08.066. ISSN 0959-6526.
7) Boulianne, Shelley; Lalancette, Mireille; Ilkiw, David (2020). ""School Strike 4 Climate": Social Media and the International Youth Protest on Climate Change". Media and Communication. 8 (2): 208–218. doi:10.17645/mac.v8i2.2768. ISSN 2183-2439.
8) Bui, M.; Adjiman, C.; Bardow, A.; Anthony, Edward J.; et al. (2018). "Carbon capture and storage (CCS): the way forward". Energy & Environmental Science. 11 (5): 1062–1176. doi:10.1039/c7ee02342a.
9) Burke, Claire; Stott, Peter (2017). "Impact of Anthropogenic Climate Change on the East Asian Summer Monsoon". Journal of Climate. 30 (14): 5205–5220. arXiv:1704.00563. Bibcode:2017JCli...30.5205B. doi:10.1175/JCLI-D-16-0892.1. ISSN 0894-8755. S2CID 59509210.
10) Burke, Marshall; Davis, W. Matthew; Diffenbaugh, Noah S (2018). "Large potential reduction in economic damages under UN mitigation targets". Nature. 557 (7706): 549–553. Bibcode:2018Natur.557..549B. doi:10.1038/s41586-018-0071-9. ISSN 1476-4687. PMID 29795251. S2CID 43936274.
11) Callendar, G. S. (1938). "The artificial production of carbon dioxide and its influence on temperature". Quarterly Journal of the Royal Meteorological Society. 64 (275): 223–240. Bibcode:1938QJRMS..64..223C. doi:10.1002/qj.49706427503.
12) Cattaneo, Cristina; Beine, Michel; Fröhlich, Christiane J.; Kniveton, Dominic; et al. (2019). "Human Migration in the Era of Climate Change". Review of Environmental Economics and Policy. 13 (2): 189–206. doi:10.1093/reep/rez008. hdl:10.1093/reep/rez008. ISSN 1750-6816. S2CID 198660593.
13) Cohen, Judah; Screen, James; Furtado, Jason C.; Barlow, Mathew; et al. (2014). "Recent Arctic amplification and extreme mid-latitude weather" (PDF). Nature Geoscience. 7 (9): 627–637. Bibcode:2014NatGe...7..627C. doi:10.1038/ngeo2234. ISSN 1752-0908.
14) Costello, Anthony; Abbas, Mustafa; Allen, Adriana; Ball, Sarah; et al. (2009). "Managing the health effects of climate change". The Lancet. 373 (9676): 1693–1733. doi:10.1016/S0140-6736(09)60935-1. PMID 19447250. S2CID 205954939. Archived from the original on 13 August 2017.
15) Curtis, P.; Slay, C.; Harris, N.; Tyukavina, A.; et al. (2018). "Classifying drivers of global forest loss". Science. 361 (6407): 1108–1111. Bibcode:2018Sci...361.1108C. doi:10.1126/science.aau3445. PMID 30213911. S2CID 52273353.
16) Davidson, Eric (2009). "The contribution of manure and fertilizer nitrogen to atmospheric nitrous oxide since 1860". Nature Geoscience. 2: 659–662. doi:10.1016/j.chemer.2016.04.002.
17) DeConto, Robert M.; Pollard, David (2016). "Contribution of Antarctica to past and future sea-level rise". Nature. 531 (7596): 591–597. Bibcode:2016Natur.531..591D. doi:10.1038/nature17145. ISSN 1476-4687. PMID 27029274. S2CID 205247890.
18) Dean, Joshua F.; Middelburg, Jack J.; Röckmann, Thomas; Aerts, Rien; et al. (2018). "Methane Feedbacks to the Global Climate System in a Warmer World". Reviews of Geophysics. 56 (1): 207–250. Bibcode:2018RvGeo..56..207D. doi:10.1002/2017RG000559. ISSN 1944-9208.
19) Delworth, Thomas L.; Zeng, Fanrong (2012). "Multicentennial variability of the Atlantic meridional overturning circulation and its climatic influence in a 4000 year simulation of the GFDL CM2.1 climate model". Geophysical Research Letters. 39 (13): n/a. Bibcode:2012GeoRL..3913702D. doi:10.1029/2012GL052107. ISSN 1944-8007.
20) Deutsch, Curtis; Brix, Holger; Ito, Taka; Frenzel, Hartmut; et al. (2011). "Climate-Forced Variability of Ocean Hypoxia" (PDF). Science. 333 (6040): 336–339. Bibcode:2011Sci...333..336D. doi:10.1126/science.1202422. PMID 21659566. S2CID 11752699. Archived (PDF) from the original on 9 May 2016.
21) Diffenbaugh, Noah S.; Burke, Marshall (2019). "Global warming has increased global economic inequality". Proceedings of the National Academy of Sciences. 116 (20): 9808–

9813. Bibcode:2019PNAS..116.9808D. doi:10.1073/pnas.1816020116. ISSN 0027-8424. PMC 6525504. PMID 31010922.

22) Doney, Scott C.; Fabry, Victoria J.; Feely, Richard A.; Kleypas, Joan A. (2009). "Ocean Acidification: The Other CO_2 Problem". Annual Review of Marine Science. 1 (1): 169–192. Bibcode:2009ARMS....1..169D. doi:10.1146/annurev.marine.010908.163834. PMID 21141034. S2CID 402398.
23) Fahey, D. W.; Doherty, S. J.; Hibbard, K. A.; Romanou, A.; Taylor, P. C. (2017). "Chapter 2: Physical Drivers of Climate Change" (PDF). In USGCRP2017.
24) Fischer, Tobias P.; Aiuppa, Alessandro (2020). "AGU Centennial Grand Challenge: Volcanoes and Deep Carbon Global CO2 Emissions From Subaerial Volcanism – Recent Progress and Future Challenges". Geochemistry, Geophysics, Geosystems. 21 (3): e08690. Bibcode:2020GGG....2108690F. doi:10.1029/2019GC008690. ISSN 1525-2027.
25) Franzke, Christian L. E.; Barbosa, Susana; Blender, Richard; Fredriksen, Hege-Beate; et al. (2020). "The Structure of Climate Variability Across Scales". Reviews of Geophysics. 58 (2): e2019RG000657. Bibcode:2020RvGeo..5800657F. doi:10.1029/2019RG000657. ISSN 1944-9208.
26) Friedlingstein, Pierre; Jones, Matthew W.; O'Sullivan, Michael; Andrew, Robbie M.; et al. (2019). "Global Carbon Budget 2019". Earth System Science Data. 11 (4): 1783–1838. Bibcode:2019ESSD...11.1783F. doi:10.5194/essd-11-1783-2019. ISSN 1866-3508.



International Journal of Advanced Research in Arts, Science, Engineering & Management (IJARASEM)

| Mobile No: +91-9940572462 | Whatsapp: +91-9940572462 | ijarasem@gmail.com |