Bundelkhand Journal of Academic Research

Global Warming: It's Impact on Life on the Earth

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https://doi.org/10.5281/zenodo.23004684

Abstract

Global warming is long-term shifts in temperature and weather pattern. Today every country is facing the various problems due to global warming but no one is trying to mitigate it seriously, as a result today we are in a very dangerous situation and whole human and other creatures' life are in danger. Rising temperature is also affecting the crop patter, growth and causing various types of diseases. However, the challenge lies in the inconsistency and inadequacy of checking pollution monitoring and waste management systems, which are the root cause of global warming. The consequences of climate change due to global warming includes intense droughts, water scarcity, severe fires, rising sea levels, flooding, melting polar ice, catastrophic storms and declining biodiversity. Global warming can result in many serious alterations to the environment, eventually affecting human health. It can also be the reason of a rise in sea level, a change in sleet patterns, causes to the loss of coastal land, enlarging risks of droughts and floods and threats to biodiversity. In this paper, it is tried to explore the impact of global warming on life on the earth and provide suggestions how to overcome this problem of rising temperature and global warming.

Article Info			
	Received: 24 Aug, 2026	**Accepted:** 07 Sept, 2026	**Published:** 30 Sept, 2026
	Table: 00	**Figures & Graphs:** 01	**Sources & Ref.:** 21
	Keywords:	Global Warming, Life on the Earth, Environmental Issues, Rising Temperature, Climate Change.	

1. Introduction: Climate change involves gradual and changes in earth's temperature and weather patterns over a long period. Such changes can occur naturally, such as due to variations in sun's activity or major volcanic eruptions. However, over the last 200 years, human activities have been the main driver of climate change. This is largely attributed to the combustion of fossil fuels, including coal, oil and natural gas (United Nations, 2024). When fossil fuels are burned, they release greenhouse gases into the atmosphere. These gases function like a blanket around the earth, preventing heat from escaping and causing the planets temperature to rise. During 1990 to 2015, global net greenhouse gas emissions from human activities rose by 44 per cent. In 2024 energy-related carbon dioxide emissions increased by 0.8%, hitting all time high of 37.8 Gt (International Energy Agency, 2024). Industrial greenhouse gases such as perfluorocarbons (PFCs), hydrofluorocarbons (HFCs), sulphur hexafluoride (SF6), and atmospheric greenhouse gases like CO2, nitrous oxide (NOx), ozone, methane, and volatile organic compounds (VOCs) are known to contribute to climate change (Tohka, 2005).

The Earth is facing a rise in temperature due to the release of greenhouse gases caused by human activities, notably the Industrial Revolution. CO2 is the primary greenhouse gas emitted,

and it can capture and retain infrared energy (Yoro and Daramola, 2020). Temperature as a climatic parameter is defined as possessing a quality of being measured and stands as a very crucial parameter of observing multiple processes (Strom, 2019). It is an evolving component arising due to an exchange of heat between all the components and elements which are located in an area in which land cover elements come at the forefront (Globe, 2014). The Earth's average surface temperature has been steadily increasing since the 1950s, and this pattern is projected to persist from 1980 to 2099 (Cai et al., 2021). Projections indicate that global sea levels are anticipated to increase by 0.18 to 0.59 meters between 1980 and 1999 (Simpson et al., 2014). Pollution is a significant contributor to the phenomenon of climate change. Climate change, acid rain, ozone depletion, and a slew of diseases (such as cancer, respira¬tory and skin ailments, and others) are only a few of the world's repercussions of air, water, and soil pollution (Gates, 2023). Many people view climate change primarily as a rise in temperatures but warming is just the start. Since Earth is a system where all parts are connected, changes in one area can affect others. The main greenhouse gases responsible for climate change are carbon dioxide and methane These gases are produced by using gasoline in vehicles, burning coal, clearing land and cutting down forests. Agriculture, oil and gas activities are significant sources of methane emissions. The primary sectors that contribute to greenhouse gas emissions are energy, industry, transportation, buildings, agriculture and land use. Environmental pollutants are harmful chemicals that enter the environment through human activities like industrialization as well as natural events such as volcanic eruptions. These pollutants can contaminate water, air and soil posing serious risks to public health. When Humans are exposed to these pollutants primarily through inhalation, ingestion or skin contact, their metabolic system, leading to illness or diseases. The quantity of a pollutant that enters the body referred to as the "dose", and its effect depends on how long and how intensely a person is exposed.

1.1. Objectives of the study: The study is guided by the following objectives:

1. To study the impact of rising temperature on life on the Earth.
2. To provide suggestions to control rising temperature which is causing global warming.

2. Research Methodology:

The present study is descriptive in nature. We have studied various research papers, book chapters and other available online and offline study related materials. In this study, we tried to elaborate the impact of global warming or rising temperature of our earth on life. Global warming has caused the climate of the planet to lose its equilibrium in recent decades, so climate change has attracted a great deal of attention in the study of climate change.

3. Impact of Global Warming:

Since the Industrial Revolution, global greenhouse gas emissions have significantly increased due to human activities in energy production, manufacturing, and car emissions (Malik et al., 2016). With the increase in average global temperatures, there is an expectation of more occurrences of abiotic stress, which could threaten food security and global production (Calanca, 2017). Climate change is a threat to human health and well-being, affecting the physical environment and ramifications to natural and human systems, such as social and economic conditions and health systems (World Health Organization, 2023).The Intergovernmental Panel on Climate Change, defined climate change as substantial and persistent changes in the statistical distribution of weather patterns over long periods, usually covering decades to millions of years. The WHO noted climate change as a multiplier of threats that undermine and potentially reverse decades of progress in health (WHO, 2023). With changing climatic conditions, people are witnessing more frequent and severe weather events, such as storms, extreme heat, floods, droughts, and wildfires. Environmental pollution is a known contributor to global warming, which has been associated with an increase in harmful health effects. Among these are the fol¬lowing: the proliferation of vector-borne infections, problems

with breathing and allergies, occurrences of mental illness, and acts of group aggression (Upadhyay, 2021). In 2023, severe rainfall, deforestation, urbanization, and climate change caused flash floods in Iran, damaging agricultural land and infrastructure and displacing residents (Kumar, 2024). Mangroves and human lives and property are significantly endangered by typhoons, windstorms, floods, heatwaves, cold spells, forest fires, and other forms of extreme weather events (Wang and Gu. 2021). The reduction in the size and vital¬ity of mangroves will increase risks to human safety and the safeguarding of coastal areas from potential hazards. Mangrove swamp plants are essential components of ecosystems that serve a vital role in mitigating coastal erosion (Kathiresan, 2021). In addition, mangroves play a crucial role in miti¬gating the adverse impacts of climate change globally (Muhammad et al., 2023).

Different countries and persons living on the earth will be affected in different ways, more than the others will but there are certain impacts that will probably affect life on the earth completely.

- Working outside of house has become insufferable: With the year by year increasing global warming, heat waves are common thing and expected to increase prevalence, time-duration and potency. Heat waves that occur in sequence regularly, one after other will also increase, making recuperation from these heat waves much more arduous. People who work outside of the house like construction workers, miners, firefighters, field-based technicians, farmers and agricultural workers will be the most affected by these increasing temperatures.
- Sky-high electric bills: With the rise in temperatures, people require to stay cool for the reason of health and comfort. Since we depend on more heavily on ACs and fans, electricity bills get higher. Between the mid-2000 and 2023, there has been near ten times increase in power outages, approx. 80 percent of which is caused by weather.
- Anticipatory blackouts have become a common problem: Many industries have been anticipatory shutting down power-supply to avoid the possibility of sparking in electric equipments in the summer season and windy conditions. Millions of people lost power-supply during whole year blackouts. Brownouts and blackouts have become common resulted if hydropower plants have less water to draw from in rivers and lakes and if such water becomes too hot to cool coal or/and nuclear power plants.
- More skin diseases, allergies and other health related issues: Warmer temperatures are the main cause of the antigen season to be longer than normal and worse quality of air both can result in more skin disease, allergy and asthma attacks problem. Ground level ozone which increases when temperatures warm, can also cause breathing problem, coughing, chest pain, lessen lung functions and worsen asthma and other chronic lung related diseases.
- Quantity of degraded-water is increasing: Severe storms and heavy rainfall are resulting in the contamination of water natural resources. Runoff picks up pollutants from the streets and overflowing sewage systems, allowing untreated sewage to enter drinking water supplies. Polluted drinking water is causing various diseases like diarrhoea, cholera, eye, ear and skin infections. In few low-lying coastal areas of the countries, rising sea level may cause saltwater to enter groundwater and affecting drinking water supplies.
- Outdoor exercise and recreational sports will be more difficult: Reducing snowfall and early snow melting in the spring season will have an impact on snowmobiling, skiing and other winter sports. Lesser water in rivers and lakes is also affecting boating and fishing during summer season. Hotter temperatures, especially in the South and Southwest region is making summer season activities like biking, hiking, running and fishing less enjoyable and indubitably dangerous to our health.
- Disturbance in travel by air: As temperature rises, it might get hotter for some planes to fly. As hotter air is less dense, so planes get less lift under their wings and engines produce less power. This is one reason why long-distance flights from the Middle-East regions leave at

night. Enthralling travel could be upended as rising temperatures affect many popular destinations.

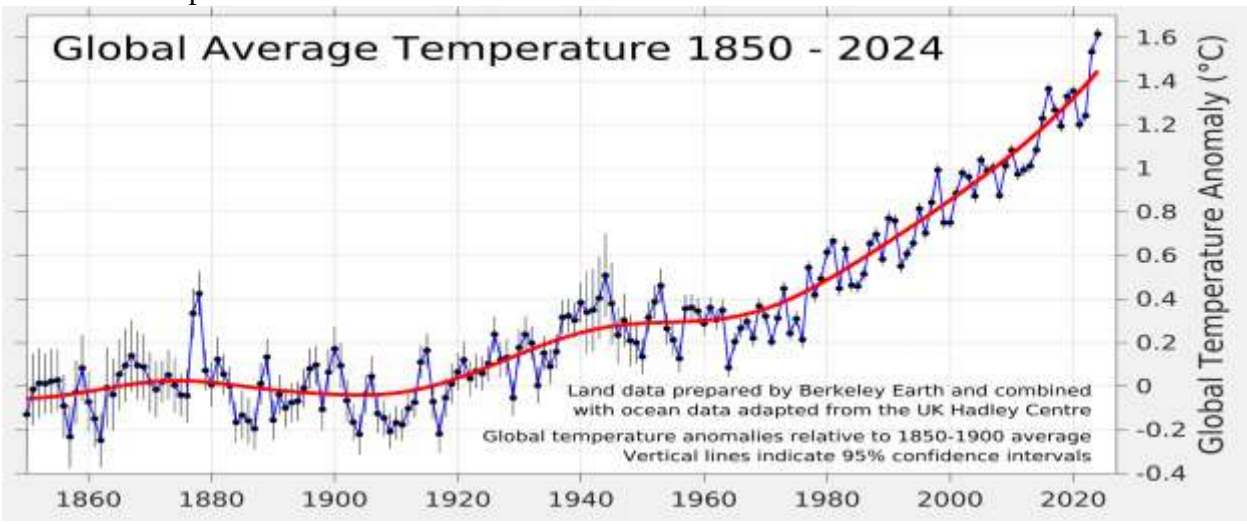
- Global impact on human health: The health effects of these disruptions include increased respiratory and cardiovascular disease, injuries and premature deaths related to extreme weather events, changes in the prevalence and geographical distribution of food- and water-borne illnesses and other infectious diseases, and threats to mental health.
- Damage to dwelling place: The most common and deadly natural disasters like floods, drought, earthquake etc. on the earth will likely be aggravated and intensified by rising sea level, unusual and extreme weather changes and difference in minimum and maximum temperature.
- Increase in home insurance cost: Since insurance companies repay handsome amounts to owners of house whose houses have been damaged by climate change impacts, many persons are taking home insurance and pay premiums to offset their damages of houses. Home insurance rates increased more than 34 percent between the year 2017 and 2023.

3.1.Earth's natural greenhouse effect: Earth's temperature depends on the Sun. Approx. 30% of incoming sunlight is thrown out back into space by radiant surfaces of the earth like ice and clouds. Balance 70% most of the temperature is absorbed by the land, ocean and atmosphere. Absorbed solar energy heats our Earth. As rocks, air and the oceans warm, they radiate "heat" energy. This energy moves into the atmosphere from the surface. Water vapour and long-lived greenhouse gases such as methane and carbon dioxide absorb its maximum part. When they absorb such energy radiating from surface of the Earth, greenhouse gas molecules turn into small heaters such as the bricks in a fireplace. They radiate in the environment in all directions. The energy that radiates back to the Earth, it heats both the surface and lower atmosphere by enhanced heat which they get from direct sunlight. By this process of absorption and radiation of heat, get the atmosphere hot, the natural greenhouse effect or normal level of greenhouse effect is beneficial for life on Earth. If there were no greenhouse effect, the Earth's average surface temperature would be a very chilly instead of the comfortable for life.

3.2. Observatory global warming by Berkeley Earth: Global warming is the abnormal rapid increase in average surface temperature of Earth over the past years mainly due to the greenhouse gases released. The global annual average temperature for 2024 is estimated approx. 1.62 degree Celsius above the average during the period 1850 to 2024. The global average surface temperature rose -0.1 to 1.55 degrees Celsius between the year 1850 and 2024 and the rate of temperature hike has nearly doubled in the last 50 years (Graph-1, Taken as it is prepared by Berkeley Earth). It is certain that temperatures will go up further. The year 2024 was the warmest year on Earth since 1850, exceeding the previous record set in the year 2023 by a clear and decisive verge and 2023 was a highly unusual year in several respects, including record hotness in most ocean basins and a large deviation from the historical trend. Despite ups and downs from year to year, global average surface temperature is rising. (Global Temperature Report 2024 by Berkeley Earth).

3.3. How is Today's warming is different from the past? Climate change on the Earth was without the help of human in the past. We all know about past climates because of evidence left in ocean sediments, coral reefs, tree rings, layers of ice in glaciers and layers of sedimentary rocks. For example, bubbles of air in glacial ice capture tiny samples of atmosphere of Earth, which gives scientists a historical information of greenhouse gases. The chemical build-up of the ice provides evidence about mean global temperature. Although volcanoes are active around the world and continuously emitting carbon dioxide (CO_2) as usual they did in the past, the quantity of CO_2 they release is extremely small as compared to human activities emissions. On average, volcanoes emit between 130 and 230 million tonnes of CO_2 per year, But by burning fossil fuels human release about 36.80 billion metric tonnes of CO_2 into the atmosphere in the year 2023, which is more than 100 times. In this way, human activities obliterated the contribution of volcanoes in global

warming. This global warming is causing changes to the living and physical environment of Antarctica continent. Melting of eternal ice and snow covers has resulted in increasing of colonisation of plants.



Graph- 1: Global Average Temperature

Source: https://berkeleyearth.org/global-temperature-report-for-2024

4. Suggestions to reduce Global Warming: Climate change elicits varying sentiments across different countries, with a sig¬nificant proportion of individuals in Greece and South Korea perceiving it as a sub¬stantial menace (Majeed et al., 2024). The level of acceptance of climate change differs among nations such as the United States, Canada, South Africa, Australia, and the United Kingdom (Sarkodie and Strezov, 2019). Nanotechnology has the potential of manipulating matter at the atomic and molecular levels to construct complex structures with novel molecular arrangements. Nanotechnology has great capability to solve the problem of global warming and climate change. Nanotechnology is being studied for renew¬able energy generation, carbon capture and storage (CCS), water purification, and sustainable material creation (Mohammad et. al., 2025). Nanotechnology refers to the capacity to construct materials, electronics, and sys-tems with utmost precision at the atomic level (Nasrollahzadeh et al., 2019). Nanomaterial-based lubri¬cants and coatings significantly reduce engine friction and wear, resulting in a 2% drop in fuel consumption and carbon dioxide emissions (Pownraj and Arasu. 2021). By switching energy systems from fossil fuels to renewable energy such as solar energy or wind energy will certainly reduce the emissions driving climate change. However, we have to act now. Emissions must be cut in half by 2030 or nearby years to keep warming below 1.5^{o}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 the year 2050 in order to check catastrophic levels of climate change.

Conclusion: The stratosphere layer gets warmer during solar-maxima because the ozone layer absorbs ultraviolet light. More ultraviolet light during solar-maxima means warmer temperature. Ozone depletion explains the biggest part of the cooling of the stratosphere over recent decades but it cannot account for all of it. Increased concentrations of CO_2 in the troposphere and stratosphere layer together contributed to the cooling in the stratosphere. During the year 2023, 17% of the Earth's surface had a locally record warm annual average (Global Temperature Report 2023 by Berkeley Earth). Many solutions to check climate changes can deliver economic benefits while improving our lives as well as protecting the environment. We also have global frameworks and agreements to guide progress, such as the sustainable development goals, UN Framework Convention on Climate Change and Peris Agreement. Three wide categories of action are adapting to climate impacts, cutting emissions and financing required adjustments. Global warming and its

climate change effects are the most complicated problems humanity has ever faced. Climate change is no longer new and the harsh realities are with us today. Besides the apparent effects on people's life, it is predicted that global warming has a very stringent impact on human health. Those countries that have contributed the least to global warming are the most vulnerable to diseases and death due to by higher temperatures. The coastlines along with Pacific Ocean and the Indian Ocean and in sub-Saharan Africa would be at the highest risk of enduring the health effects of global warming and climate changes.

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Cite the article:	Vivek and Maurya, Jyoti (2026). Global Warming: It's Impact on Life on the Earth. Bundelkhand Journal of Academic Research (BJAR), Volume-2, Issue-3, July-September 2026, Page 145-150. https://doi.org/10.5281/zenodo.23004684