

Open Schools Journal for Open Science

Vol 8, No 2 (2025)

Vol. 8 No. 2 (2025): Open Schools Journal for Open Science - Special Issue -IDEA Conference Proceedings



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doi: [10.12681/osj.43797](https://doi.org/10.12681/osj.43797)

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To cite this article:

Gkamplias, P., Dimitropoulos, T., Toliás, N., & Markopoulos, G. (2025). CLIMATIC CHANGE AND HUMAN IMPACT. *Open Schools Journal for Open Science*, 8(2). <https://doi.org/10.12681/osj.43797>

CLIMATIC CHANGE AND HUMAN IMPACT

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Abstract

Climate change is a long-term alteration of temperature and typical weather patterns in a place. While climate fluctuations have occurred throughout Earth's history, the current pace and scale of change are unprecedented. Human activities, especially the burning of fossil fuels and deforestation, are significantly contributing to the greenhouse effect, resulting in global warming and widespread environmental consequences. This document explores the underlying causes of climate change, its devastating effects on both ecosystems and human societies, and potential solutions to mitigate its impact. The purpose is to foster greater awareness and encourage responsible environmental behavior at all levels of society.

Keywords: *Climate Change, Greenhouse Gases, Global Warming, Human Activities, Environment, Sustainability*

1. Introduction

Climate change refers to measurable long-term changes in the average weather patterns, including temperature, precipitation, and wind patterns. Although natural phenomena such as volcanic eruptions or variations in solar radiation can influence climate, the dominant force behind recent climate shifts is anthropogenic caused by humans. The Industrial Revolution marked the beginning of large-scale fossil fuel consumption, releasing vast amounts of carbon dioxide and other greenhouse gases into the atmosphere. These gases trap heat, disrupt natural climate systems, and have led to a steady increase in global temperatures, with far-reaching consequences for life on Earth.

2. Structure

- What Causes Climate Change?
- Consequences of Climate Change
- Human Impact
- Effects on the Environment
- Effects on Humans
- Solutions to Climate Change
- Conclusion

3. What Causes Climate Change?

Human activities such as burning fossil fuels (coal, oil, and natural gas), deforestation, intensive agriculture, and large-scale industrial processes have all contributed to the accumulation of greenhouse gases in the atmosphere. Carbon dioxide, methane, and nitrous oxide are the primary greenhouse gases responsible for warming the planet. Land-use changes, especially the destruction of forests which act as carbon sinks, exacerbate the problem by reducing the Earth's natural ability to absorb carbon dioxide. Livestock farming produces significant quantities of methane, and fertilizers release nitrous oxide, both of which are far more potent than carbon dioxide in trapping heat.

4. Consequences of Climate Change

The effects of climate change are already being felt across the globe and are expected to intensify over time. Environmental impacts include rising global temperatures, sea-level rise due to melting glaciers and polar ice, and more frequent and severe weather events such as hurricanes, floods, droughts, and wildfires. Coral reefs are bleaching, and biodiversity is under severe threat as species struggle to adapt to rapid environmental changes. Humans are affected through disrupted food production, increased water scarcity, more widespread disease, and the economic costs of natural disasters. Vulnerable communities face displacement, poverty, and health crises.

5. Human Impact

Humans are both contributors to and victims of climate change. The modern lifestyle—centered around consumerism, heavy energy use, industrialization, and global transportation—drives much of the emissions. Urbanization often leads to deforestation and the sealing of soil surfaces, which disrupts local climate systems. Waste generation, especially non-biodegradable and hazardous waste, further pollutes the environment. The ecological footprint of developed nations far outweighs that of developing countries, though the latter often bear the brunt of climate-related consequences.

6. Effects on the Environment

Climate change affects all forms of life on Earth. As temperatures rise, ecosystems such as tundras, forests, and coral reefs are being altered or destroyed. Wildlife migration patterns are shifting, and seasonal cycles are becoming unpredictable, affecting plant pollination and animal reproduction. Ocean acidification caused by increased carbon dioxide absorption is damaging marine life, especially shellfish and coral species. Ecosystem collapse threatens food chains and the balance of natural habitats, posing a severe risk to planetary biodiversity.

7. Effects on Humans

The human population is increasingly exposed to climate-related risks. Extreme weather events destroy homes, infrastructure, and livelihoods. Prolonged droughts and altered rainfall patterns threaten agricultural productivity, leading to food shortages and increased prices. Climate-sensitive diseases such as malaria and dengue are spreading to new regions. Coastal

communities are especially vulnerable to rising sea levels and storm surges. Climate change is also a threat multiplier—it exacerbates existing socio-economic inequalities and increases the risk of conflicts over resources like water and arable land.

8. Solutions to Climate Change

Combating climate change requires a collective global effort. Key strategies include transitioning to renewable energy sources like solar, wind, and hydroelectric power; improving energy efficiency in homes, transportation, and industries; and enforcing policies to limit emissions. Forests must be preserved and restored to serve as carbon sinks. International cooperation through agreements such as the Paris Climate Accord is essential to coordinate efforts. On an individual level, lifestyle changes—such as reducing meat consumption, minimizing waste, and conserving energy—can make a significant difference. Education and public awareness campaigns are crucial to shift societal behaviors toward sustainability.

9. Conclusion

Climate change is the defining challenge of our time. Its impacts are global, interconnected, and accelerating. To ensure a livable future, urgent action is needed from governments, businesses, and individuals. Investments in clean technology, climate-resilient infrastructure, and sustainable practices must be prioritized. Every action counts—from local conservation projects to international climate treaties—and the time to act is now.

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