

Day: Tuesday

Date: 07/04/2026

(44513 - Sana Qayyum - 092)

## Essay:- Climate Change: Causes and consequences

### Outline

#### I. Introduction

1.1. Hook

1.2. Background

1.3. Thesis statement: This essay will explore the causes behind climate change like: Industrialization, deforestation, transportation, burning of fossil fuels and urbanisation leading to severe consequences like: global warming, melting of glaciers, natural disasters and mass migration.

#### II. Causes of Climate change

2.1. Industrialization

2.1.1. Release of  $CO_2$

2.1.2. Smoke emission

2.2. Deforestation

2.2.1. Use of forests for fuel (wood and charcoal)

2.2.2. Consumption of live stock grazed on forest land

2.2.3. Area required for construction of buildings

2.3. Transportation

2.4. Burning of fossil fuels

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2.4.1. The carbon legacy

2.4.2. Excessive use of heavy machinery

### 2.5. Urbanization

2.5.1. Economic opportunities

2.5.2. Improved infrastructure and services

2.5.3. Social and cultural pull

2.5.4. Rural Push factor

2.5.5. Surging population

## 3. Consequences of Climate Change

### 3.1. Global warming

3.3.1. Eco-system collapse

3.3.2. Rapid temperature shift

3.3.3. Heat waves

3.3.4. Higher temperature and process of decomposition.

### 3.2. Melting of glaciers

3.2.1. Rising sea level

3.2.2. Warmest years

3.2.3. Albedo effect

3.2.4. Glacier lake outburst floods

3.2.5. Habitat loss

### 3.3. Natural disasters

3.3.1. Floods

3.3.2. Relentless hurricanes, typhoons and cyclone

3.3.3. Droughts

3.3.4. Volcanic eruptions

### 3.4. Mass migration

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3.4.1. Land usage

3.4.2. Carbon footprint changes

4 How Pakistan is affected by climate changes?

3 Suggestions to combat the alarming consequences of climate changes

6 Conclusion

## The Essay

"We face a true planetary emergency. The climate crisis is not a political issue. It is a moral and spiritual challenge to all humanity."

(Al-Gore, Nobel Prize winner 2007)

The phenomenon of climate change stands as the defining challenge of 21<sup>st</sup> century, representing a systemic shift in the Earth's weather patterns and average temperatures that transcends national borders. In 20<sup>th</sup> century the average global temperature was 13.9°C and now in 21<sup>st</sup> century (2001-2026) the average global surface temperature is approximately 15.2°C. As of 2003, the concentration of carbon dioxide is over 50% higher than it was before the start of industrial revolution in late 1800s. This has become a major threat to all forms of life on Earth and this situation is worsening each passing day. Therefore, this essay will

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explore the causes of climate change like: industrialization, deforestation, burning of fossil fuels and urbanization leading to severe consequences like; global warming, melting of glaciers, natural disasters and mass migration. These causes are not decendent from heaven, they are man-made and only with strong will and determination we can address this issue of climate change.

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Essay:-

## Climate change; Causes and consequences

(Body paragraphs)

Industrialization serves as a primary driver of climate change, through the intense combustion of fossil fuels like, coal, oil and natural gas, to power factories and manufacturing plants. These processes release massive amount of greenhouse gases, specifically, Carbon dioxide and methane, into atmosphere creating a heat trapping 'blanket' that elevates global temperatures. These carbon intense fuels, when undergo combustion, release stored carbon that has been trapped underground for million of years. This sudden surge in  $\text{CO}_2$  concentration overwhelms the planet's natural absorption capacity. Atmospheric  $\text{CO}_2$  concentrations are projected to reach an annual average of 429.7 (PPm) in 2025. This average represents a roughly 57% increase above pre-industrial level (280ppm). Furthermore, industrial chimneys and exhaust systems discharge thick smoke containing particles matter and toxic pollutants like sulphur dioxide. This smoke emission not only degrades air quality but also forms aerosols that can alter cloud formation and solar radiation absorption. As these plumes disperse, they contribute to the formation of smog and acid rain, further damaging sensitive ecosystems.

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consequently, the transition to an industrial economy has fundamentally altered atmospheric chemistry, accelerating the pace of climate change at an unprecedented rate.

Deforestation significantly precipitates global warming by eliminating vital 'carbon sinks' that naturally absorb atmospheric carbon dioxide. The use of forests for fossil fuel (wood and for charcoal) is one cause of deforestation, but in the first world our appetite for wood and paper products, our consumption of livestock grazed on former forest land, and the use of tropical forests land for commodities like palm oil plantation contributes to the mass deforestation of world. When forests are cleared or burned for agriculture and urban development, the carbon stored within the trees is released back into the atmosphere as  $\text{CO}_2$ , a primary greenhouse gas. Beyond carbon release, the loss of canopy cover disrupts local water cycles and reduces biodiversity, further destabilizing the ecosystems essential for climate regulation. Urban expansion and building construction account roughly 2% of global deforestation. Between 2001 and 2024, approximately 168 million hectares of trees cover were lost to permanent land-use changes worldwide. While majority of this was for farming, urban settlement and industrial infrastructure significantly contribute to "fragmentation", where large forests are broken into smaller, less healthy patches.

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Therefore, deforestation acts as a dual catalyst for climate change by simultaneously increasing carbon emissions and reducing the earth's cooling capacity.

Beyond land use, the transportation sector acts as one of the key determinants of climate change by burning fossil fuels like gasoline and diesel. This combustion releases massive quantities of  $\text{CO}_2$  and nitrous oxide ( $\text{N}_2\text{O}$ ) into atmosphere, trapping heat and raising global temperatures. The greenhouse gas (GHG) contribution is further intensified by the rapid expansion of urban centers and the subsequent surge in private vehicle ownership. Whether through daily commutes in passenger vehicles or the heavy emissions from international shipping and aviation, our reliance on internal combustion engines creates a persistent carbon footprint. Over the last five years, the transportation sector has contributed significantly to rising global temperatures, accounting for approximately 20% to 25% of global energy-related carbon emissions. Global road transport emissions reached over 6Gt of  $\text{CO}_2$  in 2024, road vehicles continue to drive nearly 70% of all transport-related warming. Recent heatwaves in 2025 caused by greenhouse gas emissions have led to buckling roads and warped rail tracks, creating a cycle where transportation-led warming damages the system themselves. A surge in electric vehicles sale has begun to slow the pace of temperature increase, though

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The sector's heavy reliance on fossil fuels remains a cornerstone of the current 1.3°C global warming. Thus, the heavy reliance on fossil fuels within the global transportation sector remains a catalyst of atmospheric degradation and rising temperatures.