

Date: 17-7-26 Essay

Day: M T W T F S S

Climate change Causes and Consequences

I Introduction

A Opening Hook and Context

a Barack Obama quote:

"We are the first generation to feel the impact of climate and the last generation that can do something about it."

b Earth's 4.5 billion year climate history vs. current unprecedented change rate.

c Climate change characterized by rising temperatures, shifting weather patterns, extreme events.

B Scope and Significance

a IPCC data: 1.1°C rise above pre-industrial levels

Projections of 1.5°C - 4°C by 2100

b Threatens environmental stability, economic prosperity, social

- equity, global security.
- C Thesis statement:
- Understanding multifaceted causes and far-reaching consequences essential for effective mitigation and adaptation strategies to safeguard planet for future generations.

II Anthropogenic Causes

Of Climate Change

A Fossil Fuel Combustion and industrial Emissions

- 1 Enhanced greenhouse effects as primary driver since industrial Revolution.
- 2 CO₂ concentrations: 280ppm (pre-industrial) → 420+ppm (current-highest in 3 million years)
- 3 NASA quote: Carbon dioxide levels today are higher than at any point in ~~point~~

at least the past 600,000 years

4 Fossil fuel burning accounts for ~ 75% of global emissions over 36 billion tons CO₂ annually

5 Transportation sector contributes 24% of global CO₂ emissions.

6 Power plants, factories, vehicles create heat trapping - atmospheric blanket

B Deforestation and Land Use Changes

1 Wangari Maathai quote: "The environment and the economy are really both two sides of the same coin"

2 Trees as carbon sinks - absorb CO₂ store in biomass

3 FAO data: 10 million hectares forest lost annually (equivalent 27 football fields per minute)

4 Clearing releases stored

Carbon, reduces future absorption capacity.

- 5 Livestock sector responsible for 14.5% of global emissions (methane from digestion)
- 6 Agricultural Practices: rice paddies, synthetic fertilizers release methane and nitrous oxide.
- 7 Cement production alone is 8% of global CO₂ emissions.

C Natural Factors and Feedback Loops

- 1 Volcanic eruptions provide temporary cooling (2-3 years), solar variations cannot explain current warming.
- 2 Arctic ice-albedo feedback: melting ice reveals darker ocean (absorbs 90% more radiation) further warming.
- 3 Peter Wadhams quote:
"The Arctic is the Canary"

in the coal mine of "Climate Change".

4 Permafrost 'thawing' releases ancient carbon. 1500 billion tons stored (2x atmospheric amount)

5 Ocean warming reduces CO₂ absorption capacity, disrupts currents like Gulf Stream.

6 Ocean absorbed 90% of excess heat but buffering capacity diminishing.

III Environmental Consequences

A Temperature Rise and Ice Melt.

1 Last decade warmest ever recorded:

Arctic sea ice declining ~13% per decade.

Greenland losing ~280 billion tons ice/year.

B Sea-level-rise

rising ~ 3.3 mm/year and accelerating.

Climate central: 300 million

people at risk by 2050.

Coastal critical cities

including Karachi highly

vulnerable.

C Extreme events

Stronger cyclones, floods,
droughts, heatwaves.

Michael Mann: "We are

seeing climate change

impacts in real time."

Wildfires creating vicious
carbon cycles.

B Ocean and biodiversity

Oceans absorbed 30% CO_2 ,
acidity up $\sim 30\%$.

90% coral reefs at risk
by 2050.

Species extinction rates
100-1000x natural.

E.O. Wilson: "We are

pushing the biosphere into
the Anthropocene."

IV Socioeconomic

Consequences

A Food & Agriculture:

Crop yields may fall up to 30% by 2050.

Pakistan floods 2022:

30 million affected, \$30 bn losses.

UN Secretary General:

"I have never seen climate carnage on this scale"

B Water Scarcity:

33 countries facing extreme stress by 2040.

Pakistan per capita water $5650 \text{ m}^3 \rightarrow \sim 1000 \text{ m}^3$.

C Health:

WHO: 250,000 extra deaths/year (2030-2050)

Karachi 2015 heatwaves

1200+ deaths.

Air pollution causes 7 million deaths/year.

D Economy:

Swiss Re: 11-14% global

GDP loss by 2050.

Climate injustice: least responsible suffer most.

Greta Thunberg: "The climate crisis is both the easiest and the hardest issue!"

V Political & Security

Dimensions

Climate Change as "threat multiplier".

Syria drought (2006-10) worsened instability.

World Bank: 200+ million

Climate migrants by 2050.

Climate justice debate

between Global South & North.

VI Way Forward.

A Mitigation

Renewables Cheaper:
Solar cost ↓ 85% since
2010.

Net zero targets
spreading globally.
Nature-based solutions
can deliver 37% mitigation.

B Adaptation

Climate resilient infrastructure
water governance reforms.
Climate finance & tech transfer

Ban-ki-moon: "Climate change
is the defining challenge
of our time."

VII Conclusion.

A Climate change is a
civilizational challenge
with irreversible risks.

B Causes are: human,
Solutions must be human-
driven.

C James Hansen: "We are in
a position of causing
irreversible climate change."

o African proverb: We don't inherit the Earth from our ancestors, we borrow it from our children?
