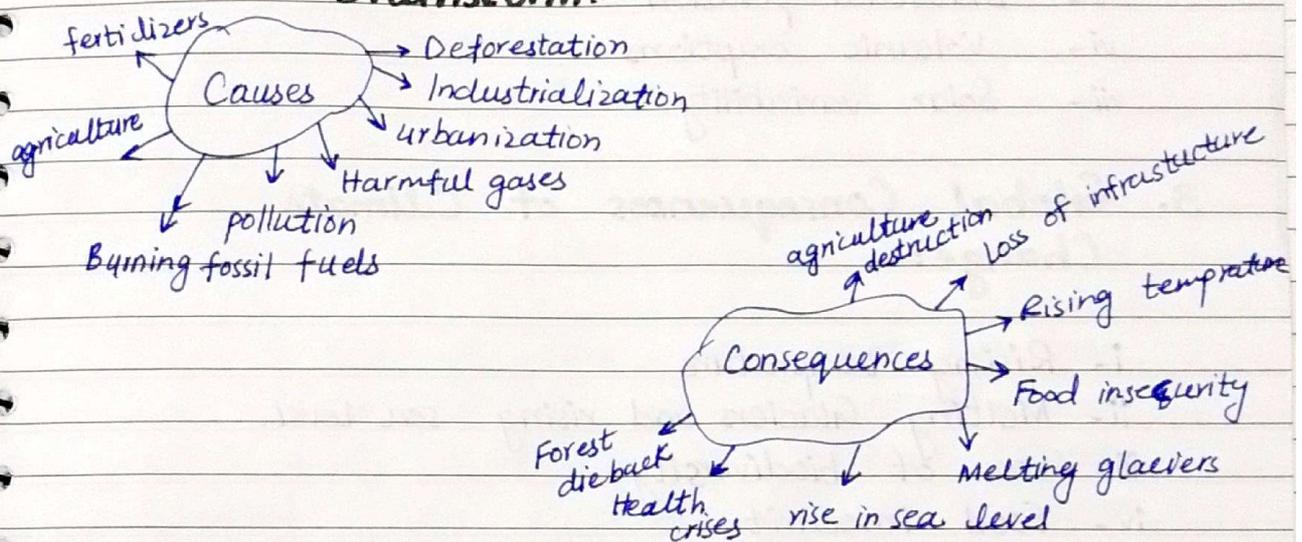


Essay:-

Climate Change : Causes and Consequences

Brainstorm:-



Outlines:-

1. Introduction:-

- i- Hook
- ii- What is climate change?
- iii- Thesis statement:

"The unchecked burning of fossil fuels and rampant deforestation, urbanization and pollution are not only increasing global temperature but are also disrupting vital ecosystems. It's threatening food insecurity through unpredictable agriculture and causing health crises, proving climate change is a multifaceted threat to our planet's stability."

2. Root causes of Climate Change :-

- i- Burning fossil fuels
- ii- Agriculture (Fertilizers, burning crops)
- iii- Deforestation
- iv- Rapid urbanization
- v- Industrial pollution
- vi- Volcanic eruptions
- vii- Solar variability.

3. Global Consequences of Climate Change:-

- i- Rising temperature
- ii- Melting Glaciers and rising sea level.
- iii- Loss of biodiversity
- iv- Food insecurity
- v- Destruction of infrastructure
- vi- Loss of lives
- vii- Agriculture destruction.

4. Examples or Case studies:-

- i- Pakistan flood 2022
- ii- Africa Drought (Somalia, Ethiopia)
- iii- Europe Heatwave
- iv- Australia Bushfire (2019-2020)

5. Climate change in Pakistan:-

- i- Why Pakistan is extremely vulnerable?
- ii- Climate change impacts in Pakistan.
- iii- Pakistan's contribution to climate change.

6. How to tackle it?

- i- Renewable energy transition.
- ii- Climate - resilient agriculture
- iii- Water management reforms
- iv- Re-forestation
- v- Strengthen research institution
- vi- Climate education in schools
- vii- Localized climate action plans.
- viii- Technology transfer

7. Conclusion:-

"In the last 20 years, our planet has seen 19 of its hottest years on record, and the clock is ticking for action." Climate change refers to the shifts in temperature and weather patterns caused by human activities such as burning fossil fuels like coal, gas and oil. These activities release carbon dioxide and greenhouse gases, which traps heat and cause global warming. Climate change has become one of the most serious global challenges. The effects are visible with increased severity of extreme weather, such as hurricanes, droughts and wildfires. Also melting glaciers contribute to the rising sea level that threatens coastal communities and low lying nations. According to the latest scientific assessment, the earth's climate system has demonstrably changed on both global and regional scales since the pre-industrial era. The "Inter-Governmental Panel on Climate Change (IPCC)" projects that the global mean temperature may increase between 1.4 to 5.8°C before the present

century ends. This unprecedented increase is expected to have severe impacts on the global hydrological system, ecosystems, sea level, crop production and related processes. The impact would be particularly severe in tropical areas, which mainly consists of developing countries, including Pakistan. The unchecked burning of fossil fuels and rampant deforestation, urbanization and pollution are not only increasing global temperature but are also disrupting vital ecosystems. It's threatening food security through unpredictable agriculture and causing health crises, proving climate change is a multifaceted threat to our planet's stability.

There are numerous causes of climate change globally. Let's discuss some of them. Firstly, the burning of fossil fuels is the largest cause of climate change in the modern world. Coal, oil, and natural gases are widely used for electricity generation, transportation, and industrial production. When these fuels are burned, they release carbon dioxide (CO_2), a greenhouse gas that traps heat in the Earth's atmosphere. According to the Intergovernmental Panel on Climate Change (IPCC), fossil fuels account for nearly 75% of global greenhouse gas emissions and about 90% of carbon dioxide emissions world wide. Since the Industrial Revolution, atmospheric CO_2 levels has increased from 280 parts per million to over 420ppm in 2023, the highest in human history (NASA Climate Data). This

excessive accumulation of heat-trapping gases has raised global temperatures and disturbed the natural climate systems. Countries with heavy reliance on fossil fuels, such as the United States and China, are among the largest contributors. UNFCCC (Climate authority of UN) quoted currently that China is the world's largest emitter, emitting about 34 to 35% of overall carbon dioxide gas, 15% is done by USA and 9% by Europe. The global temperature has dangerously increased by 1.5°C for the first time in 2024.

Secondly, agriculture is a major contributor to climate change, particularly through the use of chemical fertilizers, livestock farming, and crops burning. Nitrogen-based fertilizers release nitrous oxide (N_2O), a greenhouse gas nearly 300 times more powerful than carbon dioxide in trapping heat. The Food and Agriculture Organization (FAO) estimates that agriculture contributes around 18-20% of global greenhouse gas emissions. In many developed countries like Pakistan, farmers burn crop residues after harvest, releasing large amount of carbon dioxide and black carbon into the atmosphere. Burning destroys essential soil nutrients, leading to a vicious cycle where farmers are forced to use more chemical fertilizers to maintain productivity. FAO also reports that Nitrogen fertilizer consumption has seen massive growth since the mid 20th century, with total nutrient consumption rising from 27.4 million tons in 1960 to over 200 million tons by 2020 and the

International Fertilizer Association (IFA) have estimated that the volume of fertilizer used worldwide could increase by another 50 percent by 2050. This increased use poses a significant climate threat due to the emission of potent greenhouse gases during production and application.

Thirdly, deforestation plays a critical role in accelerating climate change by reducing the Earth's natural ability to absorb carbon dioxide. Forests act as "carbon sinks" by absorbing CO_2 during photosynthesis and storing it in tree and soil. E.F. Schumacher in his book, *Small is beautiful*, quoted that,

"Earth provides enough to satisfy every man's needs, but not every man's greed."

When the forests are cut down for agriculture, urban expansion or logging, this stored carbon is released back into the atmosphere. According to World Bank, deforestation accounts for about 12% of global greenhouse gas emissions annually. The Amazon rainforest alone absorbs nearly 2 billion tons of CO_2 each year, and its destruction significantly weakens global climate change regulations. Countries like Brazil and Indonesia have experienced massive forest loss due to commercial farming and palm oil plantations. Deforestation also disrupts rainfall patterns and increases

soil erosion. As forests disappear, the planet loses one of its most effective defenses against climate change, making global warming more severe and harder to reverse.