

Climate Change: Causes and Consequences

Outline

1. Introduction

Thesis statement; Climate change has various causes, such as industrialization, burning of fossil fuels, rapid urbanization, large-scale deforestation, and over-population that have produced unprecedented consequences of heat waves, famine, frequent droughts and looming threats of water, food shortages, biodiversity loss and socio-economic implications.

2. Causes of climate change

2.1 Rise in global emissions due to industrialization and burning of fossil fuels.
(IPCC report)

2.2 Large-scale deforestation reduces carbon sinks and produce drastic effects on the climate.
(Global Forest Watch report)

2.3 Rapid urbanization and increased human activity
(UN Report)

2.4 Increasing incidents of nuclear leakage
(Chernobyl incident)

2.5 population explosion and constrained resources

3. Consequences of Climate change

3.1 Unprecedented increase in natural disasters.

3.2 Frequent heatwaves, prolonged and extreme ~~and extreme~~ weather patterns and extreme weathers.

3.3 Increased melting of glaciers and looming threat of fresh water shortage.

3.4. Reduced productivity of crops due to extreme weather.

3.5 Socio-economic crisis and health issues after repeated disasters due to climate change.

3.6. Biodiversity loss

4. Way forward to mitigate climate change.

5. Conclusion

ESSAY

From the melting glaciers of the Himalayas to the arid conditions of the desert, climate change is not merely a theory but a reality. Climate change is long-term changes in weather patterns that include extreme weather conditions, heatwaves, and prolonged duration of weather. These extreme patterns and frequent disasters are threatening the survival of mankind on Earth. Climate change is due to increased greenhouse gases in the atmosphere leading to global warming. Some of the causes of climate change include industrialization, burning of fossil fuels, rapid urbanization, large-scale deforestation, and overpopulation that have produced unprecedented consequences, such as heatwaves, famine, frequent disasters, looming threats of water and food shortages, biodiversity loss, and socio-economic impacts. However, the world has now become cautious, and international bodies are working to mitigate the causes of climate change and reverse its effects.

To start with, when the industrialization phase started the concept of climate change was largely unknown. Rapid industrialization along with dependency on non-renewable resources produced a large amount of greenhouse gases, such as carbon dioxide (CO_2), methane (CH_4), and chlorofluorocarbons (CFCs). According to the report of the Intergovernmental Panel on Climate Change (IPCC), 35% of the global emissions are from energy sectors, 25% of the global emissions are from agricultural sector, 21% ^{emissions} are from industrial, and 15% emissions arise from transport sector of the world. These greenhouse gases (GHGs) trap heat in the atmosphere in large amount, a phenomenon called global warming.

Additionally, global emissions include gases that deplete the ozone layer (a layer in the atmosphere that protects the Earth from harmful ultraviolet radiations). Depletion of ozone layer leaves Earth more exposed to the harmful sun-rays and results in global warming. These factors result in increased temperature of the atmosphere, and resultantly, climate change ~~occurred~~ occurs.

Secondly, deforestation is a significant cause of climate change, and reforestation can reverse this change. Plants are the natural carbon sinks that trap carbon dioxide and release oxygen into the atmosphere. Deforestation is cutting of trees where they used to exist. Annually, large-scale deforestation occurs that reduces carbon sinks and resultantly, more carbon is accumulated in the atmosphere. According to a Global Forest Watch Report, more than 10 million hectares have been deforested ~~over~~ ^{the} last decade.

Similarly, Pakistan faces this issue. According to a report, every year 42-46 square miles of forests are deforested in Pakistan. The purposes behind this menace are building houses, highways, industries, ^{and} plazas etc. However, deforestation has produced devastating consequences in the form ~~shape~~ of climate change that the world is facing now.

Thirdly, rapid urbanization and increased human activity are also major causes of climate change. Urbanization is the movement of people from remote areas into cities for various purposes.

of education, jobs, and healthcare facilities. However, rapid and unmonitored urbanization produces many challenges. According to the UN (United Nations) Report, 54% of the population was urbanized in 2014 and 60% of the population is urbanized nowadays.

This rapid migration overpopulates the cities. They require housing and jobs, facilities. Along with housing, other issues, such as traffic congestion, pollution, and solid wastes management arise. These processes increase the release of greenhouse gases in the atmosphere and contribute to the climate change.

Fourthly, rising incidents of nuclear leakages are very harmful for the atmosphere and cause climate change. The world is witnessing frequent wars and conflicts as well. Nuclear radiations are extremely dangerous that pollute air, water, and soil, and leave prolonged effects on human health. The Chernobyl incident of 1986 and nuclear leakage incident of Iran are prominent in the history. They resulted in evacuation of cities and those cities are still uninhabitable. Hence, nuclear leakages also contribute to the climate change.

Lastly, increasing population with constrained resources fastens the global emissions and causes climate change. There are various incidents in the history when millions of people lost their lives but the world has never witnessed a dip in the global population graph. According to the US census Bureau report, there was 3 billion global population in 1960, 6 billion in 2000, 8 billion in 2022 and 8.1 billion today. In the next 8-10 years, global population

will rise upto 9 billion. This report highlights how fast the population is rising. Similarly, if we compare last two ^{census} censuses of Pakistan, 33 million people ^{were} added between the censuses of 2017 and ^{that of} 2022. This population explosion not only constraints the available resources but also produces significant role in climate change. The increased human activity enhances deforestation, industrialization, pollution, and urbanization. In the end, there is a rise in greenhouse gases and hence, climate change occurs.

~~The above-mentioned causes of~~ climate change the climate change produces unprecedented consequences. Unexpected weather patterns, extreme weather conditions, such as intense heatwaves, heavy and prolonged monsoons, famine, frequent disasters like flooding, earthquakes, avalanches, landslides, and thunderstorms are prominent nowadays.

According to the climate risk index report, Pakistan is one of the most climate-affected countries.

The floods of 2022 highlighted the damages of climate change. They resulted in not only socioeconomic crisis but also political impacts on the country. Hence, climate change consequences are far more than one's thoughts beyond what many can imagine.

Secondly, there is increased melting of glaciers due to climate change, and it has produced looming threats of fresh water shortage. The world contains only 3%

fresh water in the form of ice and underground water. However, due to climate change, glaciers are melting ~~fast~~ rapidly. According to a report, Pakistan's glaciers are melting very rapidly. Hence, climate change has threatened future survival of mankind humanity due to ^{increasing} water shortages. The melting glaciers also produce risks of urban flooding and economic losses as well. ~~However~~ Thus, the consequences of climate change are both detrimental and unavoidable, with serious economic repercussions.

Additionally, crop productivity has been reduced since last decade due to intense weathers and frequent disasters, which ~~has~~ resulted in food crisis and poverty. Pakistan is an agrarian country, with more than half of its population is dependent on agriculture. However, being a climate-vulnerable state, Pakistan has witnessed million dollar losses due to climate change. Pakistan faced losses of almost 33 billion dollars after floods of 2022. Major crops including rice, wheat, sugarcane reduced in their productivity that gave rise to more poverty and hunger. Therefore, crops production has also been affected by climate change.

Furthermore, frequent disasters give rise to socio-economic crisis and emergence of diseases. ~~The floods of 2022 in Pakistan were such prominent example of socio-economic crisis.~~ The people faced destruction of their homes, displacement, poverty and hunger. ^{Additionally} The education of thousands of children was disturbed. The country

witnessed increase in crime rates as well. Multiple diseases emerged, such as malaria, typhoid, dysentery, cholera, and dengue etc. Therefore, climate change results in wide range of consequences that shatter the countries' economy.

Another major consequence of climate change is biodiversity loss. The extreme weather events impact terrestrial as well as aquatic plants and animals. Intense heatwaves and extreme cold weathers make it difficult for animals and plants to survive. The biodiversity loss disturbs the natural habitat of the earth and produce harmful consequences.

However, climate change is not an irreversible phenomenon. It can be controlled and even reversed if the world works against it. There should be limited used of fossil fuels and world should shift to the other renewable resources of energy, such as solar energy, wind energy, hydal energy etc. Deforestation should be controlled and reforestation should be initiated at large scale. A great example of reforestation in Pakistan is Billion tree Tsunami project in which billion trees will be planted in 5 years. Another solution is planting trees with Miyawaki method. This method is introduced by a Japanese botanist that can produce 10 times faster and denser forest. It is an effective method for faster reforestation. Climate-friendly countries should be constructed that

can face disasters like earthquake and flooding. The countries should reduce emission of greenhouse gases to let ozone layer recover and reverse the climate change holistically.

To sum up, climate change is ~~bitter reality~~ ^{bitter reality} in this century that the world is facing. It has several causes including industrialization, nuclear leakages, deforestation, over-population, and large-scale global emissions. These causes produce unexpected consequences in the form of frequent disasters, intense weather patterns, poverty, hunger, socio-economic crisis, water and food shortages. However, international bodies are working to cope up with this climate change. Some of the initiatives in Pakistan are billion Tree Tsunami to reverse these causes and make the Earth a better place to live like it was.

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