

Assignment # 1

ESSAY

Summiya Ibrahim Date 21/6 2025

CLIMATE CHANGE IN PAKISTAN : CAUSES AND CONSEQUENCES

Brainstorming.

Climate change in Pakistan

causes

- Green House effect
- Deforestation.
- Urbanization.
- Agriculture waste.

Consequence.

- Disruption in Agriculture
- Extreme weather conditions
- Economic issues.
- Health problems.

outline.

1. Introduction.

- 1.1. Drought is a National Emergency.
- 1.2 Climate change
- 1.3 Thesis Statement.

2. Causes of climate change in Pakistan.

2.1 Green House Effect.

- 2.1.1 Rise of Green House Gases
- 2.1.2 Global Warming
- 2.1.3 Ozone depletion.
- 2.1.4 Combustion of fossil fuel.

2.2 Rapid Deforestation and Forest Degradation

- 2.2.1 Decrease Absorption of CO_2
- 2.2.2 Loss of Biodiversity.
- 2.2.3 Disruption of water cycle.
- 2.2.4 Soil Erosion.



2.3 Uncontrollable Urbanization and Population Growth

2.3.1 Rapid unplanned urban growth.

2.3.2 Higher Energy Demands.

2.3.3 Lack of climate Resilient Infrastructure

2.3.4 Transportation

2.4 Inefficient Agriculture Sector.

2.4.1 Use of chemical fertilizers.

2.4.2 Inefficient Irrigation

2.4.3 Rice fields and live stock emits methane.

3. Consequences of Climate Change.

3.1 Disruption of Agro-climatic Zones.

3.1.1 Damaging essential crops.

3.1.2 Difficulty in growing crops.

3.1.3 Food Insecurity

3.1.4 Low Quality Crops.

The Essay

Date _____ 20____

"Drought is a national emergency" - Sherry Rehman - This powerful statement reflects the urgency at which climate-related disasters are escalating. Pakistan is one of most climate vulnerable countries in the world. (GCR-Index) Major contributors of climate change in Pakistan are green house effect, rapid deforestation, forest degradation, uncontrollable urbanization, Population growth at fast pace, and lastly, inefficient agricultural sectors. These contributors of climate change disrupt agro-climatic regions, Extreme weather conditions also Economic and health related problems. Climate-change for Pakistan is not just an environmental issue anymore. It is social and economic crisis demanding urgent attention.

One of major causes of climate change is green house effect. There is natural layer around earth, in which green house gas (GHG) absorbs and emits energy causing green house effect - which is very important for sustainability of life on earth. However, These gases include carbon dioxide CO_2 , Methane (CH_4), Nitrous oxide etc. - However, ~~due to~~ human activities, since the beginning of Industrial revolution (around 1750), have increased levels of green house gases globally. These gases trap heat, resulting in extreme weather conditions, rise in sea levels, Ecosystem disruption, a phenomenon called global warming. It refers to Consequently, green house gases, named Chlorofluorocarbon gases in our ecosystem react with ozone layer, Ozone



layer is a blanket layer protecting world from harmful UV rays of sun. As these UV radiations effect ecosystem leading to minimum growth of flowering and other plants. These plants are important source of oxygen. Moreover, green house effect, also causes global warming. It refers to recent and ongoing increase in earth's temperature largely due to human activities. Global warming result in high sea levels, intense heat waves, changes in precipitation and disruption of the ecosystem. Finally, combustion of fossil fuel result in exothermic reaction which contributes to green house effect and also the reason of air pollutants (SO_x , NO_x) which turn to acid rain, even with smallest precipitation level. It disrupts climate's ecosystem.

there is

In past few decades, rapid deforestation and forest degradation to build infrastructure and real estate in Pakistan. Vegetation play crucial role in purifying air and water. It's loss can worsen our pollution levels.

Thus, there is major decrease in absorption of CO_2 , due to deforestation. In past 60 years, CO_2 in atmosphere has increased 100-200 times faster (NOAA, 2022). Reduction in core forests has also resulted in loss of Biodiversity. According to Islamabad wild life management, Unique Species to to ~~Himalaya~~ Margalla hills National Park the Grey Goral and also Alexandria parrots



are now extinct. The loss in biodiversity threatens environmental stability. Moreover, as trees and forestation are also major contributors of balanced water cycle - Deforestation ^{has} also immensely disrupted this balance. Reduced evotranspiration leads to decrease rainfall ^{and} dried climates. On the other hand, there could be sudden outburst clouds, as ecosystem has been disrupted. ~~Recent~~ ^{As recent}, Moonsoon spell in july in Pakistan has resulted in floods and cloud bursts more or less all over in the country. Since, there are no leaves or trees to absorb water or slow down the flow of floods. This has also resulted in soil erosion, as water just run off with no protective layer over soil - Soil erosion in turn increases the likelihood of floods.

Third inflicting climate in Pakistan is Population growth and uncontrollable urbanization. The material and process of creating more infrastructure and housing complexes with commercial complexes results in degradation of air quality. Grimmond CSB reported that Cities have 2 to 3 °C higher temperature than their surrounding. This rise in temperature is due to high energy demands. These result in more combustion of fuel, domestic and commercial, affecting level of water resources underground and unprocessed waste leading to air and water pollution and in turn exacerbating climate change. Urban infrastructure in

Pakistan ^{mostly} ~~also~~ lack any climate resilient infrastructure. Thus metropolitan cities are turning to heat wave islands. Increase use of air-conditioning in summer, releasing gases and causing green house effect. These structures are also not flood tolerant. All of these issues start altering local climate patterns. Rise of population also demand more transportation, requiring more fuel being leading to pollution and climate change. This demand in transportation also requires construction of roads and bridges, which sometime alter the natural pathways of rivers and canals. Also tax used in construction of road result in rise in temperature. Thus urbanization leading to emission from domestic, commercial and transport activities causes changes in local climate.

Pakistan is considered agrarian society. However agriculture practices in Pakistan are still outdated. Agriculture sector still largely depends on traditional farming methods. Due to extensive cropping with no scientific research on it results in decline in quality of soil. Thus leading to lesser crop yielding. To accommodate it, Pakistan still largely import fertilizers (Concavegi). These fertilizers contain harmful chemical fertilizers which pollutes the soil and also endangers biodiversity which in turn effect climate. Farmers still depend on inefficient irrigation methods outdated canal system, improper management



leads to increase in water scarcity. As weather changed globally combined with outdated irrigation system. Farmers are now compelled to utilize more underground water. For this purpose they may also combust fuel to run boring system. Similarly, excess use of underground water has also disrupted the water cycle. Combustion of fuel with disruption in water cycle can lead to major climate changes, from long dried spells to unpredictable weather patterns. Lastly, agriculture also contributes to emission of green house gases, particularly methane (CH_4). It is commonly entraps heat leading to higher temperature ~~a resulting in~~ ~~pro~~. These outdated agriculture practices results in global warming, disruption of water cycle which in turn either results in prolonged dry spells, or sudden floods or rainfall, which leads to soil erosion and thus disrupting ~~the~~ climate.