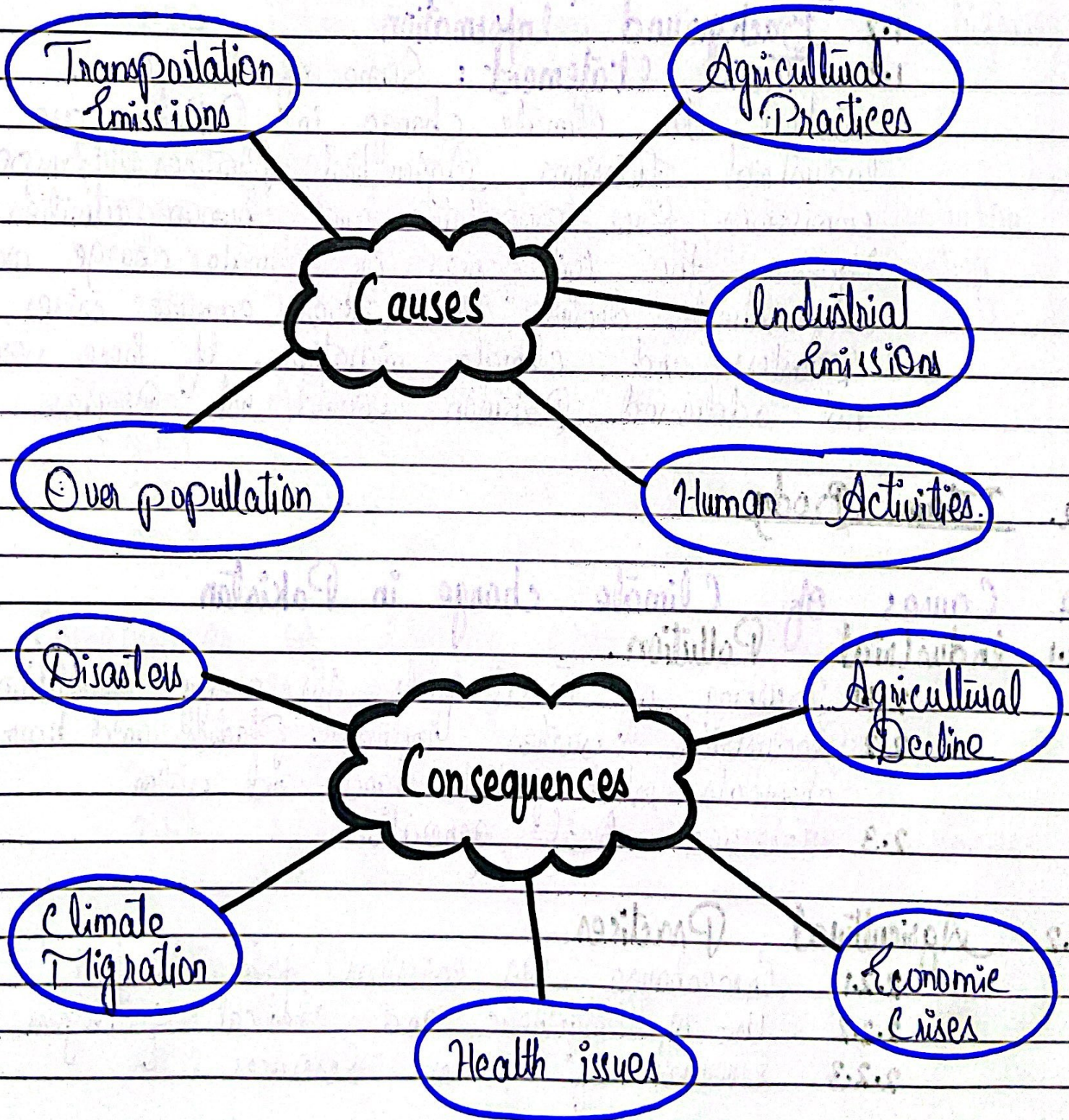


Climate change in Pakistan

Causes and Consequences

Brainstorm



Outline

1. Introduction

1.1 Attention Grabber

1.2 Background Information

1.3 Thesis Statement: Some of the causes related to climate change in Pakistan are Industrial Emissions, Agricultural Practices, Transportation emissions, Over population and human activities. However the consequences of climate change are agricultural decline, Health issues, economic crises, Disasters and climate migration. If these were not addressed, Pakistan would not progress.

2. Main Body

A Causes of Climate change in Pakistan

2.1 Industrial Pollution.

2.1.1 Burning of Fossil fuels for energy generation.

2.2 Industrial wastes includes plastics and harmful chemicals which pollute lands and water.

2.3 Excessive heat generation.

2.2 Agricultural Practices

2.2.1 Greenhouse gas emissions from livestock.

2.2.2 Use of synthetic and chemical fertilizers.

2.2.3 Overuse of Water Resources.

2.3 Transportation Emissions.

2.3.1 Toxic gases emissions from fossil fuels.

2.3.2 Increased numbers of vehicles.

2.3.3 Urbanization expansion of roads and highways lead to deforestation.

2.4 Over population.

2.4.1 Increased industrial and livestock production.

2.4.2 Higher demand of electricity and heating.

2.4.3 More water waste generation.

2.5 Human Activities.

2.5.1 Deforestation.

2.5.2 Urbanization and infrastructure expansion.

2.5.3 Water and energy overuse.

8 Consequences of climate change in Pakistan.

2.1 Health issues.

2.1.1 Respiratory diseases from Air pollution.

2.1.2 Depression and Anxiety.

2.1.3 Higher temperatures lead to heatstroke and dehydration.

2.2 Agricultural Decline

2.2.1 Reduction of crop yield due to high temperature.

2.2.2 Hurricanes, floods, storms destroy crops.

and soil.

2.2.3 Increased water scarcity due to droughts and faster evaporation.

2.3 Economic Crises.

2.3.1 Increased Disaster costs.

2.3.2 Reduced agricultural productivity.

2.3.3 Climate migration and economic displacement.

2.4 Disasters

2.4.1 More severe heatwaves and Droughts.

2.4.2 Floods, Hurricanes and Storms.

2.4.3 Rising Sea levels.

2.5 Climate Migration.

2.5.1 Overcrowding in Urban Areas.

2.5.2 Increased border and social conflicts.

2.5.3 Water and food conflicts.

3. Conclusion

3.1 Thesis Restated.

3.2 Concluding thoughts.

The Essay

Bill Gates on climate change says, "Climate change is a terrible problem, and it absolutely needs to be solved. It deserves to be on a huge priority." Climate change is neither a new issue nor is it a fully settled one. Developed countries are dealing with it successfully. Whereas, underdeveloped countries are still struggling. Unfortunately, Pakistan is one of them. The country faces extreme weather conditions, including rising temperatures, floods, droughts and irregular monsoons, which pose serious threats to agriculture, water resources, biodiversity and human health. Despite contributing less than 1% to global greenhouse gas emissions, Pakistan ranks among the top 10 countries most affected by climate, as indicated by the Global Climate Risk Index. The main causes behind climate change are: Industrial pollution, Agricultural practices, Over population, Human activities and Transportation emissions, which can lead to the following consequences; Economic crises, climate migration, health issues, Agricultural decline and disasters. Addressing climate change is crucial not only for Pakistan's sustainable development but also for the well-being of its people and ecosystems. No doubt, it is a rising the issues of climate change cannot be solved and the consequences will become more drastic and irreversible.

To begin with industrial pollution which significantly contributes to climate change in Pakistan through multiple factors. First, the burning of fossil fuels such as coal, oil and gas for energy generation releases large amounts of carbon dioxide (CO_2) and other greenhouse gases such as methane (CH_4) and nitrous oxide (N_2O). Industries rely mostly on coal, oil and natural gas to power manufacturing processes, which makes the earth warmer and causing extreme climate events like floods, droughts and heatwaves. Similarly another big problem is industrial waste. Many factories discharge plastic and harmful chemicals into rivers, lakes and land. This pollution damages the environment, kills marine life, and makes the soil unfit for farming. Plastic waste takes hundreds of years to break down and continues to harm nature for a long time. Finally excessive heat generation from industries affect the climate badly. Factories and manufacturing plants releases a lot of heat into the air, especially in cities. This raises the temperature and makes the weather even hotter. It also This not only affects human health but also disrupts climate patterns. Therefore, industrial pollution is one of the major cause of climate change in Pakistan.

The second cause is agricultural practices in Pakistan, which play a ~~big~~ ^{significant} role in climate change. One major cause is greenhouse gas emissions from livestock. Cows, buffaloes, and goats release methane gas when they digest food. Methane is a powerful gas that traps heat in the atmosphere, making the earth warmer. The more livestock we have, the more methane is released, worsening climate change. Similarly, the use of synthetic and chemical fertilizers also affects the climate. Farmers use these fertilizers to grow more crops, but they release harmful gases like nitrous oxide into the air. This gas is even stronger than carbon dioxide in trapping heat. Chemical fertilizers also damage the soil, reduce its natural fertility, and pollute water sources. Lastly, the third big problem is the overuse of water resources. Farmers use too much water for irrigation, often wasting it through inefficient methods. Overuse of water lowers ground water levels, dries up rivers and reduces water availability for future generations. Climate change is already making water scarce, and poor irrigation make the problem worse. Therefore, overuse of water resources plays a significant role in climate change in Pakistan.

The third cause of climate change in Pakistan is due to transportation emissions. Toxic gas emissions from fossil fuels, as vehicles run on petrol and diesel. They release harmful gases like carbon dioxide (CO_2), carbon monoxide (CO) and nitrogen oxides (NO_x). These gases trap heat in the atmosphere, leading to global warming and air pollution. Similarly, another major cause is the increased number of vehicles. As the population grows, more cars, buses, and motorcycles are being used. This leads to higher fuel consumption and greater emission of toxic gases. These vehicles continue to emit greenhouse gases, contributing to rising temperature and air pollution. Lastly, urbanization and the expansion of roads and highways lead to deforestation. As cities grow, more land is cleared to build roads and highways for transportation. Cutting down trees reduces the Earth's ability to absorb CO_2 , increasing greenhouse gases in the atmosphere. This not only disrupts local ecosystems but makes the climate hotter and produces less oxygen. Therefore, all these causes of transportation emissions play a significant role in climate change in Pakistan.

Worldly Overpopulation become an issue of life and death for the world. That is direct cause of climate change. With a rapidly growing population, the industrial and livestock

Production has also been increased. Industries burn fossil fuels for manufacturing products, releasing large amount of carbon dioxide (CO_2) and other toxic gases and wastes. Similarly, livestock farming has expanded to meet food demands, leading to high methane (CH_4) emissions from animal digestion and waste. Deforestation for grazing and industrial expansion further worsen climate change. Pakistan increasing population requires higher demand for electricity and heating procedures. The country relies heavily on fossil fuels like coal, oil and natural gas for power generation for homes, and industries, emitting significant greenhouse gases. Additionally many rural households use firewood and coal for heating and cooking, contributing to air pollution and deforestation. Lastly, a larger population produce more wastes, including plastic, food and industrial waste. Improper waste disposal, landfill emissions and burning of waste release methane and toxic pollutants into the air affecting climate badly. This increased population needs greater number of resources to live that is main cause of climate change.

Lastly, all previously mentioned causes are closely related to significantly influenced by human activities. Pakistan has one of the highest deforestation rates in the world, with forests covering less than 5% of its total land area. Deforestation is caused by illegal

timber trade, expansion of agricultural land, fuel wood collection for domestic use. Loss of trees reduces the process of capturing and storing Carbon dioxide from the atmosphere, leading to increased greenhouse gases. As according to report, 48-58 thousand square mile area is cleared by deforestation, especially during Covid-19 lock down. Deforestation also contributes in the loss of biodiversity, affecting ecosystem. Similarly, Urbanization and Infrastructure expansion in cities like Karachi and Lahore has led to air pollution and increased waste production. Increased vehicles emissions, industrial pollution, and poor urban planning contribute to air pollution and rising temperature which disrupts natural ecosystems and increases the risk of floods and heatwaves. Lastly, Pakistan faces severe water shortage and energy resources are frequently scarce. Inefficient irrigation practices in agriculture and excessive groundwater extraction depletes natural reserves causing droughts. Dependence on fossil fuel for energy production releases significant amounts of Carbon dioxide. Therefore, Human activities play a significant role in accelerating climate change in Pakistan.

Unfortunately, some of the causes related to climate change in Pakistan are industrial emissions, agricultural practices, transportation emissions, human activities and over population. These causes have drastic impacts. However the

consequences of climate change are economic crises, health issues, agricultural decline, disasters and climate migration.

Climate change has severe consequences in Pakistan, particularly in terms of health issues. Firstly, air pollution causes many respiratory diseases, particularly in cities like Lahore and Karachi. Toxic air weakens the immune system, making people more susceptible to lung and other respiratory infections. High levels of pollutants like sulfur dioxide (SO_2) and nitrogen dioxide (NO_2) worsen asthma and chronic bronchitis. Smog, particularly in big populated cities, leads to severe breathing difficulties, especially for children and the elderly. Similarly, mental health issues, like depression and anxiety, are also rising. Extreme weather events, displacement of peoples due to floods, and loss of livelihoods contribute to psychological disorders. Reports suggest a rise in suicide rates in regions where climate disasters have left people without resources or hope for recovery. Finally, warmer temperatures have led to frequent heatwaves, resulting in heat stroke and dehydration. Cities like Sibi and Tubal experience extreme heat, with temperatures exceeding $50^{\circ}C$ affecting children and elderly the most. Dehydration due to excessive sweating also increases kidney related diseases. Therefore, climate change is severely impacting public health in Pakistan.

Secondly, one of the major consequences of climate change in Pakistan is the decline in agriculture. Rising temperatures have significantly reduced crop yields. Many crops, such as wheat, rice and maize are highly sensitive to heat. Prolonged heatwaves weaken plant growth, reduce grain quality, and ~~the~~ leading to lower agricultural production. Farmers struggle with declining productivity, threatening food security and livelihoods. Similarly, water scarcity is another major challenge. Climate change has intensified droughts, reducing water availability for irrigation. Faster evaporation from rivers, lakes and soil further depletes water resources. The Indus River, Pakistan's primary water source, is under severe threat due to low glacier melting. ~~But~~ Lastly, extreme weather events, such as hurricanes, floods and storms are also damaging agriculture. Heavy rainfall and floods destroy standing crops, wash away fertile top soil and increase soil erosion. Coastal regions, particularly in Sindh and Balochistan face storms that damage farmland and contaminated water sources with salt water. Therefore, declining in agricultural production is one of the major consequences of climate change in Pakistan.

Third comes the economic crises, as the major consequences of climate change in Pakistan. Natural disasters such as floods, heatwaves and droughts are becoming more

frequent and severe, increasing massive disaster costs. The 2022 floods alone caused over \$30 billion in damages, destroying homes, infrastructure and businesses. The government spends billions on disaster relief and reconstruction, which worsens the economic crisis. Similarly, reduced agricultural productivity is another major consequence. Rising temperatures, water shortages, and extreme weather events have significantly decreased crop yields. Pakistan's economy heavily relies on agriculture, which contributes nearly 19% to GDP and employs 38% of the work force. Crop failure leads to food shortages, price hikes and lower farmer incomes, affecting the economy. Finally, climate change is also forcing mass migration and economic displacement. Severe droughts and floods have displaced millions, particularly in rural areas. The loss of livelihoods due to climate disasters worsens poverty and economic instability. Therefore, climate change is intensifying Pakistan's economic crisis.

Moreover, climate change is making natural disasters in Pakistan more frequent and severe, leading to devastating consequences. Firstly, heatwaves and droughts have intensified due to rising global temperatures. In Pakistan, cities like Jacobabad and Turbat experience extreme temperatures exceeding 50°C , increasing heatstroke cases.

and water shortages. Prolonged droughts reduce water availability for agriculture and drinking, especially in Sindh and Balochistan leading to food insecurity and displacement. Secondly, floods, hurricanes and storms have become more destructive. The 2022 floods submerged one-third of Pakistan, affecting 33 million people and causing over \$30 billion in damages. Monsoon patterns have become ~~more~~ unpredictable, and tropical storms in coastal regions destroy homes, crops and infrastructure. These disasters displace millions and push more people into poverty. Finally, Rising sea levels are another major concern. Coastal areas, especially Karachi and Thatta face the risk of submersion and salt-water contamination which destroys farmland and contaminates drinking water. Communities near the coast are at risk of permanent displacement. Therefore, Natural disasters causes widespread destruction and economic instability.

Lastly, climate change in Pakistan is driving large-scale climate migration, leading to severe socio-economic consequences. One of the most pressing issues is overcrowding in urban areas. Rising temperature, droughts and floods are forcing ~~urban~~ rural populations to migrate to cities like Karachi and Lahore. These cities, already struggling with overpopulation, face increased demand for housing, healthcare and jobs resulting in unemployment and poverty. Similarly,

another critical consequence is the increase in border and social conflict. The 2010 Pakistan floods displaced 20 million people. Many were forced to migrate to Karachi, leading to clashes between locals and migrants over resources.

Water shortages and desertification in Afghanistan push people to migrate, raising security concerns at the Pakistan-Afghanistan border. Pakistan has also experienced cross-border migration from India's Thar region due to worsening droughts. This climate migration leads to conflicts over jobs, land and security, straining diplomatic relations between neighboring countries. Last but not least, climate emigration in

Pakistan is worsening water and food conflict, creating social, economic and political instability. Pakistan per capita water availability has dropped below 1000 cubic meter, classifying it as a water scarce country. Pakistan depends on rivers originating from India, governed by India Water Treaty. Climate change is reducing river flows, and India's dam projects on the Chenab and Jhelum Rivers like Kishanganga Dam dispute in 2018 worsens shortages in Azad Kashmir and Gilgit-Baltistan.

Climate change has disrupted crop cycles due to heavy rainfall, droughts and floods, due to which farmers are migrating to urban areas, reducing food production and increasing reliance on imports. The 2022 floods destroyed 45% of Pakistan's cropland, displacing millions and leading to food shortages. Therefore, climate migration in

Pakistan is facing social, economic & geopolitical conflicts increasing urban tensions, unemployment, resource scarcity and border disputes.

In conclusion, the major causes of climate change in Pakistan are industrial pollution, human activities, agricultural practices, over population and transportation emission, which can lead to the consequences like health issues, agricultural decline, disasters, economic crises and climate migration. Climate change is one of the most challenging situation for Pakistan, with far reaching consequences for its environment, economy and society. The country is highly vulnerable due to its geographical location, reliance on agriculture and rapidly growing population. Rising temperature, changing weather patterns, glacier melting and increased frequency of natural disasters are already affecting millions of peoples. However, Pakistan is among the countries more vulnerable to climate change, ranking 8th globally in terms of its impacts. The nation's geographical features, including arid and semi-arid regions that receive less than 250 mm of rainfall annually, have a drastic impact on its environment. Barack Obama on climate change says, "we are the first generation to feel the impact of climate change and the last generation who can do something about it."