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Pakistan's Climatic Division and Environmental Issues

Pakistan's dynamic landscape, which includes high mountains, plateaus, plains, and coastal areas, contributes to the country's diverse climate. Due to its dynamic landscape of mountain ranges, deserts, coastal areas, and plains, Pakistan, a country in South Asia, has a variety of climates. The country experiences a variety of climates, including hot summers, cold winters, monsoon rains, and severe weather like flooding and drought. Pakistan's unique geography has created four distinct climate regions: the coast, the Indus plain, the mountains and plateau in the west, and the northern mountains. However, the nation is also confronted with a number of environmental issues, including climate change, deforestation, soil degradation, and air and water pollution. As a result, addressing these issues is essential for Pakistan's long-term growth and well-being.

Current Climatic Division of Pakistan :

Pakistan can be divided into four main climatic zones based on its topography, altitude, and proximity to the sea. These zones are as follows:

- **Coastal Zone** : This region includes the coastal regions of the provinces of Sindh and Balochistan, which experience hot, humid weather throughout the year. From July to September, the monsoon winds bring a lot of rain to this area, which can flood some places.
- **Highlands of the North** : This zone encompasses the mountainous regions of northern Pakistan, including the Himalayas, Karakoram, and Hindu Kush ranges. In these areas, winters are bitterly cold, snowy, and well below freezing. Due to the mild summers, this region is a popular tourist destination.
- **Western Plateau** : The western plateau can be found in Pakistan's southwestern part, primarily in the province of Balochistan. Nearly half of the territory's total area is covered by a vast, bone-dry region. The region is made up of rugged mountains, vast deserts, and dry river valleys. The climate of the western plateau is extremely hot and dry. In the late spring, temperatures can reach 50 degrees Celsius, and winters are mild and dry. On average, the region receives only 100-200 millimeters of precipitation annually. However, flash floods may occur in the region as a result of occasionally heavy rain.

- **Indus Plains** : Pakistan's vast and fertile Indus Plains stretch along the Indus River basin and encompass a significant portion of the country's eastern and central regions. Due to its extensive agricultural activities, the region is frequently referred to as Pakistan's breadbasket. The region's annual precipitation ranges from less than 100 millimeters in the western part to more than 500 millimeters in the eastern part. Additionally, the region is susceptible to floods and droughts, two types of natural disasters. The Indus Plains' development has been influenced by a number of factors, including a lack of water, deforestation, and soil erosion. As a result of widespread irrigation, ground subsidence has occurred in some areas, depleting groundwater resources.

Environmental Issues of Pakistan:

Both human activities and natural factors contribute to a wide range of environmental issues in Pakistan. The following are some of Pakistan's most pressing environmental problems:

- **Air Contamination** : Pakistan's air pollution is a major problem for the environment, especially in urban areas. Dust, solid waste burning, and emissions from vehicles and industries are Pakistan's primary sources of air pollution. Diseases of the lungs, problems with the heart, and other health problems are all caused by air pollution. Through the release of greenhouse gases, it also contributes to climate change. According to the World Health Organization (WHO), Pakistan had the worst air quality in 2018, with an average PM2.5 concentration of 62 g/m³. PM2.5 is a kind of fine particulate matter with a diameter of less than 2.5 micrometers that can get deep into the lungs and cause a variety of health problems. Industrialization, the burning of fossil fuels, and an increase in the number of vehicles all contribute to the country's deteriorating air quality. Air pollution has led to respiratory tract infections, eye irritation, and other health problems.
- **Water Contamination** : Water contamination is a basic issue in Pakistan, particularly in country locales where permission to clean drinking water is confined. Industrial and agricultural waste, untreated sewage, and other pollutants pollute the country's waterways. This causes cholera, typhoid, and other water-borne illnesses as well as other health problems. It also has an

impact on aquatic life and makes it harder to get clean water for drinking and for irrigation.

- **Deforestation** In Pakistan, deforestation is a serious problem for the environment because large areas of forests are being cut down for agriculture, grazing, and fuelwood. Soil erosion, decreased biodiversity, and other environmental issues result from this. By reducing the amount of carbon dioxide absorbed by forests, deforestation also contributes to climate change. The country's forest cover has decreased from approximately 5.2 million hectares in 1990 to approximately 3.2 million hectares in 2020. The country's current situation and biodiversity are all affected by this lack of woodland cover. It has also led to the breakdown of the soil, made it harder to get water, and made the area more vulnerable to catastrophic events like floods and avalanches.
- **Biodiversity Misfortune** : Another problem with Pakistan's environment is the decline of biodiversity. Numerous endemic species inhabit the nation, but numerous of them are in jeopardy as a result of habitat loss, poaching, and other human activities. Ecosystem services like pollination, water purification, and soil formation are impacted by biodiversity loss.
- **Abuse of the Soil** : In Pakistan, soil degradation is another problem with the environment. Reduced agricultural productivity and other issues with the environment are caused by soil erosion, salinization, and the depletion of nutrients. Through sedimentation and a decrease in soil's capacity to hold water, soil degradation also affects water quality.

Possible Solutions to Environmental Issues:

- **Sustainable agriculture:** Promoting environmentally friendly farming methods has the potential to lessen agricultural activities' negative effects on the environment. This can be accomplished by promoting water-efficient irrigation systems, reducing chemical fertilizer and pesticide use, and organic farming.

- **Maintaining the Forest** : Preserving and safeguarding forests is essential if we are to address the problem of deforestation. This can be accomplished through community forestry programs, protected areas, and efforts to reforest.

- **Sunlight's energy** : Advancing the utilization of environmentally friendly power sources like hydropower, wind power, and sun based power can help with bringing down discharges of ozone depleting substances and cultivating supportable turn of events. This can be achieved by advancing the utilization of environmentally friendly power sources in homes and organizations and giving motivators to the establishment of sustainable power frameworks.

- **The board of waste** : By improving waste management practices, we can reduce the amount of waste that ends up in landfills and contributes to pollution. This can be accomplished in two ways: by promoting recycling, composting, and other waste-reduction strategies, and by improving the infrastructure for waste collection and disposal.

- **Water Conservation** : Water conservation is essential in order to address Pakistan's water shortage problem. This can be accomplished by promoting water-saving technologies, improving irrigation practices, and putting water-saving policies into action.

- **Changes in Environment** : Preparation and adaptation to changing climate conditions are essential if Pakistan is to mitigate the effects of climate change. This can be accomplished by putting into place policies and programs that encourage sustainable development, cut down on emissions of greenhouse gases, and make people more resistant to climate change.

- **Environmental Education and Awareness**: Environmental education and awareness are essential for changing people's behavior and encouraging sustainable practices. Environmental education can be incorporated into school curricula, public awareness campaigns can be launched, and communities can work together to promote environmentally friendly practices.
