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Topic:

Climate Change is not a Distant Threat
but a Present Reality: Challenges and
Policy Options for Pakistan

Outline

1) Introduction

(a) Thesis Statement

Climate Change is no longer a seasonal anomaly for Pakistan but a multidimensional crisis that persistently reshapes its economy, geography, and human security.

2) Climate Change is a Stark Reality in Pakistan

(a) Rising Temperature and Heatwaves

- Average Temperature has increased by 0.6°C since 1960 (World Bank Report).

(b) Melting Glaciers and Glacial Lake outburst Floods (GLOFs)

- Global Climate Risk Index ranked Pakistan together with Belize and Italy - most affected by climate change.

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(c) Erratic Rainfall and Flooding

- 2022 super floods submerged $\frac{1}{3}^{\text{rd}}$ of the country, according to UNDP.

(d) Agricultural Loss and Water Stress

- 1.3 million acres of farmland have been submerged due to floods in Pakistan

(e) Global Recognition of Pakistan's Vulnerability

- Pakistan Ranked 8th most vulnerable country by Germanwatch's Global Climate Index 2023.

(3) Challenges For Pakistan to tackle the Menace of Climate Change

Governance Challenge (a) Lack of Climate Finance, Institutional Coordination, and Adaptation Capacity

Economic Challenge (b) Agricultural Disruptions Threatening Food Security and Rural Livelihoods

Environmental Challenge (c) Intensifying Droughts and Chronic Water Scarcity in Arid Regions.

Infrastructural and Technological Challenge (d) Poor Climate-Resilient Infrastructure and Disaster Preparedness

(4) Policy Options for Pakistan to Tackle Climate Change

- a) Governance and Institutional Policy Reforms
- b) Green Financing and Transition to Renewable Energy
- c) Reforestation and Sustainable Agricultural Reforms
- d) Climate Resilient Construction and Early Warning Systems

(5) Conclusion

The Essay

"We do not ~~not~~ inherit the Earth from our ancestors; we borrow it from our Children."

~ Native American Proverb

Climate Change is no longer a looming reality, it is a lived reality for Pakistan. Rising temperatures, erratic rainfall patterns, and the accelerating retreat of Himalayan glaciers have turned natural cycles into unprecedented calamities. Despite contributing only 1%.

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to global greenhouse gas emissions, Pakistan stands among the most climate-vulnerable nations. The geographical precariousness of Pakistan is evident through the reports of British Geographer and Administrator Sir Thomas Holdich that what is now Pakistan is environmentally volatile and fragile terrain, drought-prone, climate sensitive and monsoon dependent arable land. Therefore, the country's geography makes it uniquely vulnerable - from snow-clad north to the deltaic south, each region faces distinct climate-related threats. Pakistan's agrarian economy depends heavily on predictable weather and river-flows, yet both have become unreliable. Rural communities face shrinking crop yields and water scarcity. Urban areas such as Karachi struggle with heatwaves, smog, and resource stress. Beyond physical toll, the consecutive climatic shocks in recent years have eroded social structures, displaced communities, and deepened existing inequalities. As the crises are not limited to environmental degradation, the issue is not longer seasonal anymore and

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Thus, climate change is no longer a seasonal anomaly for Pakistan but a multidimensional crisis that persistently reshapes its economy, geography, and human security.

Over the last two decades, Pakistan's average temperature has risen by nearly 1°C , a shift that has drastically altered seasonal patterns and intensified extreme weather events. According to the Pakistan Meteorological Department, the country now faces heatwaves lasting up to eight days longer than in 1960s. For hundreds of millions of people living in Pakistan, the early summer arrival of summer heatwaves has become a terrifying reality that is testing survivability limits of residents. The plains of Sindh and southern Punjab, ~~are~~ the case in point, have particularly borne the brunt - the city of Jacobabad recorded a staggering 51°C in 2022, ranking among the hottest places on Earth. This unrelenting rise in temperature has severe repercussions for agriculture, public health, and energy systems. Pakistan's fragile energy sector has

further strained due to prolonged heatwaves that causes depletion in ground water reserves at an alarming rate of $1-1.5^*$ meters per year in Punjab and Sindh, and ⁱⁿ escalation of electricity demand by nearly 25% during peak summer months due to air conditioning loads. Thus, intensifying heatwaves are not isolated climatic disturbances but rather a direct manifestation of global warming. They represent the first and most tangible proof that climate change in Pakistan is not a distant warning.

Pakistan's mountains, often known as the "Third Pole", are home to over 7200 glaciers, the largest reservoir of ice outside the polar region. Due to rise in temperature, this frozen reservoir is melting at an alarming rate and putting lives of 220 million people in danger. According to the International Centre for Integrated Mountain Development (ICIMOD), Pakistan's glaciers are receding faster than the global average, with some in the Hindu Kush-Himalayan-

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Karakoram range losing up to 1.6 feet of ice per year. This rapid-melting has created over 3,000 glacial lakes, nearly 30 of which sit on a powder keg of disaster. Moreover, the consequences are far more disastrous beyond the northern terrain.

Pakistan's deadly monsoon floods since June 26, 2025 ^{were} heavier than ^{ever before.} ~~usual monsoon rains.~~ ^{flood}

It killed nearly 806 people and injured at least 1,110 across Pakistan. More than 7465 homes have been damaged or destroyed and dozens of people remained missing. As per the reports of National Disaster Management Authority the glacial outburst caused floods that ^{resulted in} ~~caused~~ death of 479 people in the province of Khyber Pakhtunkhwa, 69 died in Pakistan administered Kashmir, 169 died in Punjab, 57 died in Sindh, 24 died in Balochistan, and 8 died in Islamabad. In early 2025, the authority ^{also} identified 5 most vulnerable glaciers which are at a risk of glacial lake outburst floods (GLOFs). Thus, the melting glaciers, once a symbol of purity and permanence, now stand as silent alarm of the north.

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Despite contributing a small amount of green house gases as compared to other countries, Pakistan is facing the most calamities than any other ^{nation} countries. It poses an existential threat to Pakistan if it continues to rise unchecked.

Among the most alarming manifestations of climate change is the growing unpredictability of rainfall and the devastating pattern of floods. Once governed by regular monsoon cycle, the country is now facing the erratic precipitation both in intensity and timing. The Intergovernmental Panel on Climate Change (IPCC) confirms that for every 1°C rise in temperature, the atmosphere can hold about 7% more moisture due to intensification of Hydrological Cycle. In Pakistan, this means that rain which once fell gradually over weeks now descends in days or even hours, overwhelming rivers and drainage system. UNDP Climate Risk Report (2023) said that the interactions between warming, glacier melting, and unpredictable rainfall are making traditional forecasting unreliable and leave no room for early preparation against disaster. In this

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regard, 2022 floods is the case in point, UNDP (2023) reported that 2022 floods submerged nearly $\frac{1}{3}^{\text{rd}}$ of Pakistan, affecting 33 million people and destroying over two million homes. These floods inflicted economic losses exceeding US\$30 Billion. Sindh and Balochistan, traditionally arid regions, witnessed rainfall 400-500% above normal, while northern areas faced glacial outbursts that compounded the crisis. Thus, climate change transforms when, where, and how much quantity of rain falls in a certain region, turning the unpredictability of rainfall into reshaping the water governance, preparedness, and early warning systems.

Agriculture - the lifeline of Pakistan's economy - is increasingly at the mercy of climate change. It is suffering from a vicious cycle of floods, droughts, and water scarcity. Floods submerge millions of acres of farmland, destroying staple crops such as cotton, rice, and wheat. Yet, while some regions drown, others wither. Prolonged droughts in Sindh, Balochistan, and southern Punjab have parched vast tracts

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of land. Pakistan Meteorological Department identifies that rainfall variability have increased by over 25% in the past two decades. This variability is disturbing traditional crop patterns ultimately leads to agricultural loss. Meanwhile, the country's per capita water availability has plummeted below 1,000 cubic meters, pushing Pakistan into the category of water-stressed nations (WB report). As a result, Pakistan's agrarian economy faces a paradox of both water excess and water deficit, where floods annihilate harvests and droughts choke the next.