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Climate Change – An Emerging Threat and Way Forward for Pakistan

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ABSTRACT

Climate change is the shift in frequency of weather patterns resulting from fossil fuel consumption since the 1800's. These activities trap more CO2 levels up higher in the atmosphere and lead to spikes in global temperatures. Because of this, we have more extreme temperatures in a shorter timespan than in the history of civilization. This has become a problem in Pakistan, and is one of the most at risk countries according to the Global Climate Risk Index. They account for less than 1% of global greenhouse gas emissions and are environmentally, socially, and economically affected the most. This article attempts to recognize the complexity of climate change in Pakistan looking at the elements, the vulnerabilities in the region, and the socioeconomic dimensions. Some of the most pertinent and problematic climate change consequences that will be looked at are flooding, drought, food insecurity, rapid urbanization, and climate change policy. The agricultural crisis will be looked at as part of the economic and social crises caused by the loss of freshwater and the loss of a healthy population. This research will try to provide an analysis of existing National Climate Change Policy and studies to show some of the most problematic and complex issues that slow or block attempts to achieve resilience against climate change. This research will also try to show some of the complex issues like financial limits and implementation gaps and the need for more interdisciplinary research to slow the environmental crisis that ends the country's economy.

Keywords: *Climate Change, Pakistan, Agriculture, Water Security, Policy Adaptation, Glacial Meltdown.*

INTRODUCTION

Climate change is a global issue, but has different impacts in the various countries. In countries like Pakistan, climate change impacts and contributes to very little greenhouse gas emission. Climate change has become a significant threat in Pakistan, an existential challenge to them (Arif, & Mahsud, 2024)." While contributing less than 1% to the world's greenhouse gases, Pakistan is the 5th most vulnerable country to climate change related calamities. With the largest concentration of non-polar glacial regions, desertification, changing precipitation patterns, and GLOFs cause disasters which threaten its food security. With almost 50% of the population relied on agriculture, the economic stability is threatened (Abrol, & Gupta, 2019). Variation in climatic patterns and disasters continue to threaten Pakistan. This study will analyze the effects of climate change on Pakistan and its mitigation strategies. This article examines the breadth of climate change as a national concern for Pakistan, the challenges posed, and available options for addressing this challenge (Pachauri, 2012)

Research Questions

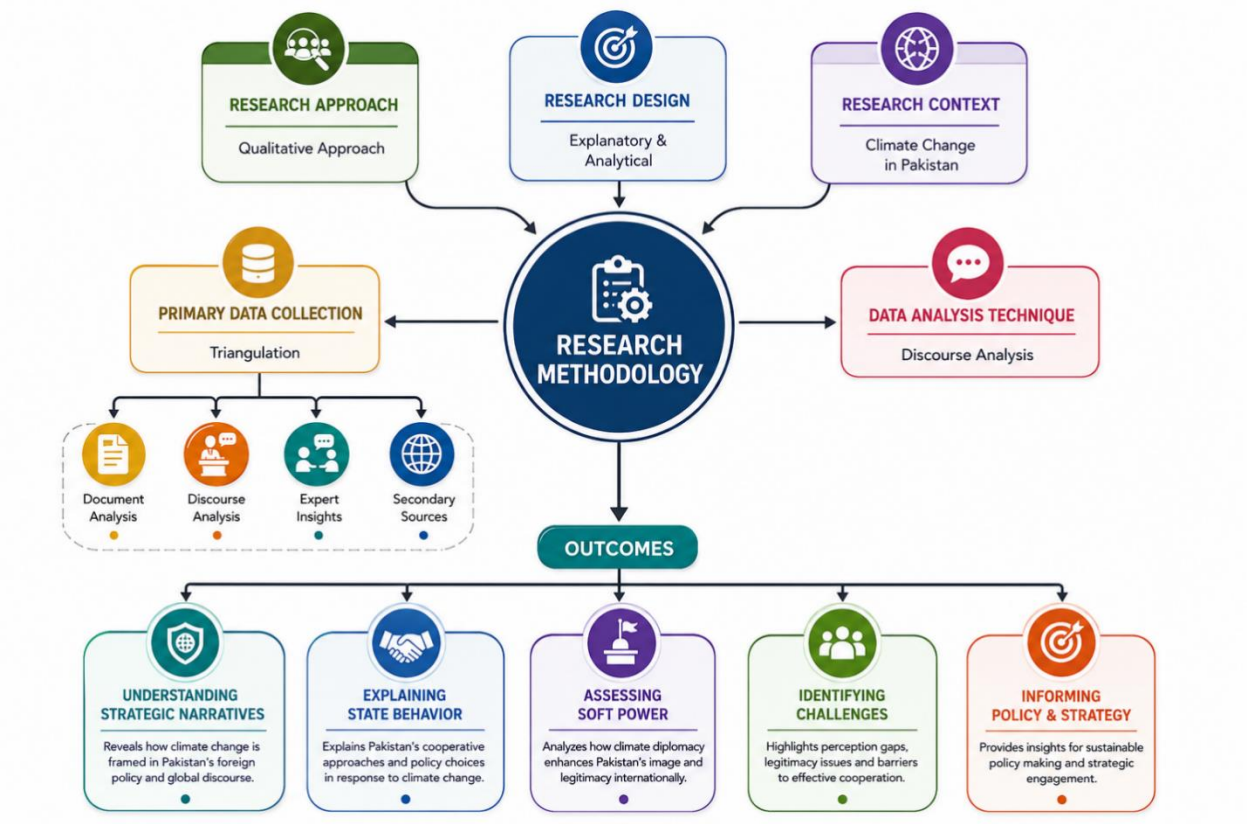
- How Pakistan is vulnerable to climate change?

- How to mitigate the challenges in policy making to control climate change in Pakistan?
- What are the proposed solutions to control climate change as a security threat?

Research Objectives

- To identify the major impacts of Climate change on Pakistan
- To identify that how a strong policy making can play its part in controlling the Climate change in Pakistan?
- To identify the major challenges in addressing the climate change in Pakistan?
- To suggest a suitable way fwd for controlling Climate in Pakistan.

RESEARCH METHODOLOGY



The qualitative research approach is selected for this study since it focuses on the interpretation of social phenomena through meanings, narratives, and the context of social phenomena rather than describing them through numbers. Qualitative research is highly applicable for analyzing the intricate political and strategic phenomena where perceptions, intentions, and discourses are of utmost importance (Reyes, 2011). Furthermore, qualitative techniques have been the scope of research in international relations and the study

of security in analyzing the behaviors of states, strategic narratives, and diplomacies (Miskimmon, O'Loughlin, & Roselle, 2012). This approach is applicable to this study given that Climate Change in Pakistan is more of a soft phenomenon, in more of perceptions, legitimacy, cooperation, and soft power, which cannot only be described using numbers. This study employs explanatory and analytical research designs. Explanatory research is primarily concerned with establishing relationships of cause and effect and is often concerned with 'why' and 'how' (Skinner, & Dancis, 2026). It goes beyond just 'how' and 'why' things occur to explain the rationale behind the occurrence of a certain phenomenon in a certain manner. Analytical research is an organized approach to studying the available data, theories, and literature in order to test proposed relationships and formulate conclusions (Gelso, 2006). It focuses on evaluating the available literature rather than generating new primary data. The main technique of primary data collection is based on triangulation.

The triangulation method incorporates multiple data sources, improves qualitative findings, and enhances reliability and validity of results (Franklin, & Ballan, 2001).

In the context of security and strategic studies, relying on a single source is likely to cause bias or be insufficient. Discourse analysis is employed to investigate how language constructs social inequality and the political social order and relations of power (Mogashoa, 2014). Within international relations, analysis of state behavior is often explained through the use of strategic narratives, official statements, and policy speech. Discourse analysis is typically used for statements on foreign policy, defense white papers, and diplomatic correspondence (Kosovych, Kotovska, & Kulyk, 2022).

SIGNIFICANCE

Pakistan is one of the most impacted countries by climate change and related disasters, and despite contributing less than 1% to climate change, studying how Pakistan is affected by climate change is globally significant. As an agrarian society, Pakistan is increasingly threatened by the alteration of monsoon patterns, more severe water shortages, and the Hindu Kush-Himalayan Glaciers accelerated Glacial melting (Rasul, 2014). This will further impact the long-term availability of freshwater to Pakistan. Pakistan is in dire need of localized context-specific evidence-based approaches for climate-resilient agriculture; as well as water management, and early warning systems in order to avert cascading and severe impacts on millions due to increasing flood and heatwave events (Yadav, CLIMATE EXTREMES: HEATWAVES, DROUGHTS, HEAVY RAINFALL AND HURRICANES. CLIMATOLOGY, 102) .

Research is the first step for Pakistan to understand these moving parts to make the transformation to a low carbon economy, get support for climate change from other countries, and strengthen the resilience of the country against the changing climate.In Pakistan, writing a research paper on climate change is very important because of how vulnerable Pakistan is to climate change, despite the fact that it contributes to less than 1% of climate change globally (Althor, Watson, & Fuller, 2016).

Understanding Climate Change and Its Global Context

Climate change is a change in the climate and temperatures of the earth due to the human treatment of it. Burning fossil fuels, removing forests and the industries they support causes climate change. With these, greenhouse gasses are released, mainly carbon dioxide, methane and nitrous oxide. These gases, when in the atmosphere, create a greenhouse effect which results in warming of the world. Present and past climate changes have been most strongly caused by industrialized countries. However, the least contributors to the climate change are the developing countries such as Pakistan, who are the maximum sufferers (Khan, 2023). The impacts of climate change are limitless. As the weather becomes more volatile and extreme events like

flooding become more frequent and other calamities like droughts increase, changes in agriculture are becoming commonplace and food insecurity has become yet another concern. (Sivakumar, 2005)

Major Global Impacts of Climate Change

The impacts of climate change on ecosystem, economy, health, agriculture, water security, and human security across the globe is one of the biggest challenges of the 21st century. While vulnerabilities differ from location to location, from income to income, from governance to governance, and from infrastructure to infrastructure, as well as from capacity to respond to capacity to respond, all countries are vulnerable. (Brooks, Adger, & Kelly, 2005)

Global warming is causing increase in more frequent heat waves, droughts, Wildfires and Reduced labor productivity leading to rise in average temperatures globally. Climate change has led to increased intensity and frequency of floods, hurricanes and cyclones and heavy rainfall i.e 2022 Pakistan floods, European heat waves and Australian bushfire season 2019–20. Melting glaciers and warmer oceans are causing sea levels to rise (Dey, & Lewis, 2021). Many species are threatened by changing temperatures and habitat degradation.

Pakistan's Vulnerability to Climate Change

Part of the reasons why Pakistan is deemed vulnerable to the effects of climate change are somewhat related to its geography, economic structure and socio-political situations. Pakistan has varied geophysical features ranging from the vast Himalayans to coastal in Sindh and Balochistan. Pakistan is facing its fair share of climate difficulties.One of the examples of the effects of climate change in Pakistan is the 2022 floods, which shows the immense challenges posed to the people, the economy, and the environment (Rehmat, Ahmad, Danish, Umar, Khaver, & Khan, 2023).

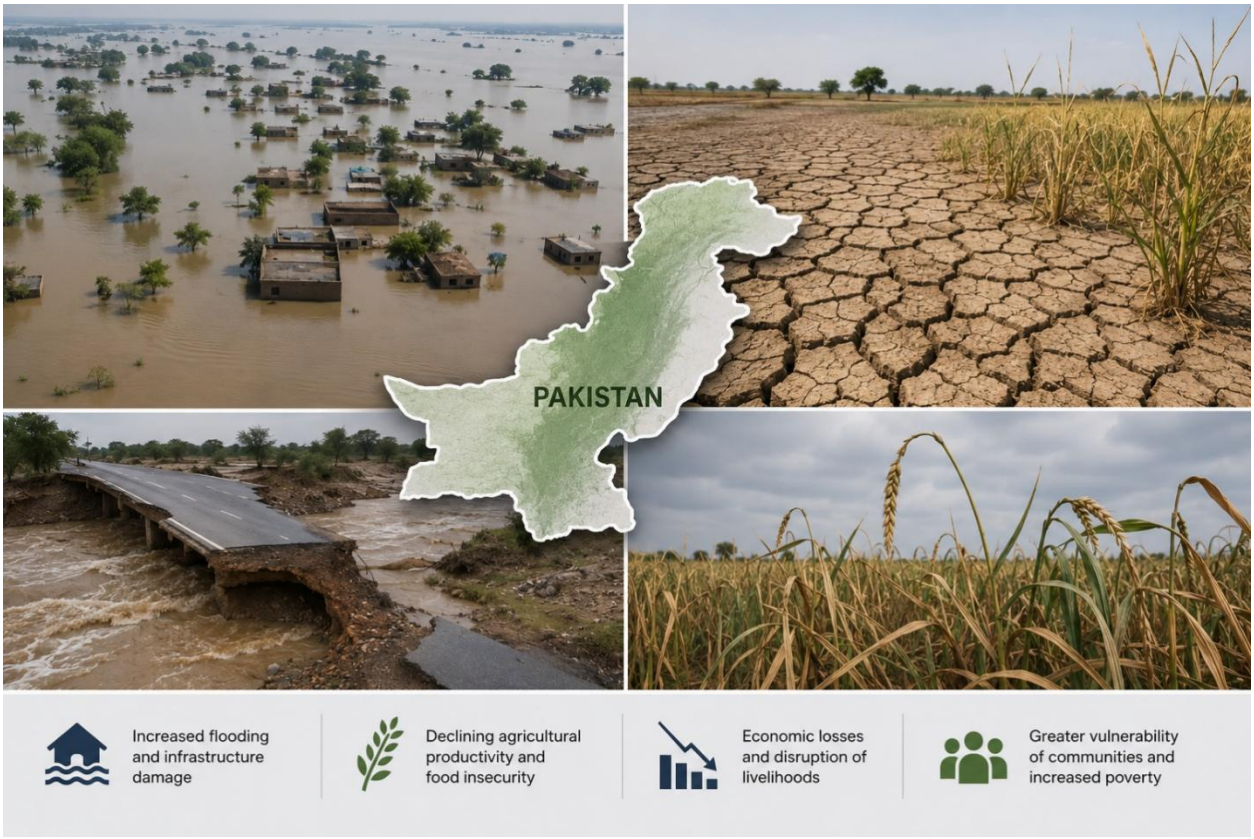
The major vulnerabilities consist of the following:

- **Climatic Zones and Geographical Diversity:** Pakistan's geography and climate are extremely varied. Pakistan's geography leaves it vulnerable to a wide variety of climate extremities. The northern regions are susceptible to melting glacial floods, while the southern coastal regions are leaving the country endangered to rising sea levels. The country has extreme desert climate flooding and drought desertification. Pakistan's global diverse geography makes each challenge wide, deep and varied. This variety of climate impacts makes national level policy formulation complex and challenging (Azhar, Asif, & Ahmad).

- **Monsoon Dependency:** A lot of employment and most of Pakistan's economy hinge on agriculture. The monsoon impacts this. But with climate change, the monsoon has changed drastically. Droughts can also be followed by heavy downpours. These drought-rainfall cycles affect the rural labor force, escalate food supply shortages, and worsen flooding and other socio-economic issues (Vasin, 2023).

- **Glacial Melt and Water Scarcity:** Is Pakistan's north containing The Himalayas and the Karakoram Range. They are home to some of the largest glaciers that exist outside of the polar regions. These glaciers are beginning to melt. Global warming is raising the temperature and is causing the rivers downstream to flood and also affecting the water supply. The country's water supply relies on the Indus which is comprised mainly of glacial melt and also destroys the economy and agriculture of the country (Biemans et al., 2019).

Climate Change and Impacts on Pakistan



Damage to Infrastructure & Flooding One of the most evident and harmful impacts of climate change in Pakistan has been the increased frequency and intensity of flooding. 2010 floods were the benchmark for calamity. It affected 20 million people, cost the government billions in damage and had roughly half the country under water. This was due to record monsoon rains. Similarly, in 2022 Pakistan experienced the same level of devastation that resulted in the deaths of 1,700 and the impact on 33 million people, causing structural damage to the already fragile economy of Pakistan. The situation of these floods is a crisis within a crisis as poverty and climatic disasters are increasing on the displaced and uprooted people (Shahbaz, Liaqat, & Ali, 2024).Decline of Agriculture and Food Insecurity. Agriculture provides 20% to Pakistan's GDP and employs almost 40% of its people. The largest sector of the economy - agriculture - is influenced by climate change. Droughts, variations in rainfall and intensity, livestock and variable weather are affecting agricultural productivity. Land which previously was productive could become unproductive. Important crops such as wheat, rice and cotton could be at greater risk. The erratic nature of crop production causes food insecurity, economic uncertainty and increasing food costs (Naylor, & Falcon, 2010). Rural populations, particularly smallholder farmers, the most vulnerable, are bearing the brunt of the effects of climate changes. Food insecurity is a cause of increasing poverty and a trigger for social instability

Water Scarcity

The Indus is Pakistan's greatest river, its main source of water, fed by seasonal rains and glacial runoff. Water flow in the rivers is decreasing due to changes in rainfall patterns and increased glacial melt due to climate change. Currently, due to a greater than 1,000 cubic meters of water availability per person each year, the nation is classified as water stressed (Damkjaer, & Taylor, 2017). The situation is aggravated by

the increased water needs from urbanization, industrialization, and agriculture. Water short is a growing problem in Pakistan and as water plays a significant role in generating electricity, water scarcity will cause several challenges including energy challenges.

Health Impacts of Increasing Heatwaves

They say heatwaves. The impacts of climate change and urbanization are increasing the severity of heatwaves in Karachi and Lahore cities. Recently, temperatures in some areas of Pakistan have reached the maximum of 50°C. The most vulnerable are being disproportionately affected by extreme heat, such as the elderly, very young people and impoverished communities (Leap, Soled, Sampath, & Nadeau, 2024).The prolonged nature of heatwaves can exaccrabate already existing public health concerns. For instance, with the absence of clean water, one may end up drinking water that is not fit for human consumption which can cause water borne diseases. Other health issues related to heatwaves are occurrences of heat-related illnesses (such as dehydration and heat stroke) and exacerbation of already chronic conditions such as cardiovascular diseases. With the already huge number of cases, the burden on the health care system of Pakistan will skyrocket (Khalid, & Ali, 2020).

Political, Economic, and Social Impacts of Climate Change

Village-to-town migration. Rural communities have been impacted by climate change and have driven the migration towards urban areas in search of better economic opportunities contributing to increased rural poverty. This has caused tremendous stress on a variety of urban centers of Pakistan that are already experiencing over-crowding, homelessness, joblessness and stressed public transport and other infrastructure. Migration towards urban slums releases more pollutants which directly impact migrants to the increased exposure to climate-related challenges like heat waves and floods (Naser, 2011).

Economic Challenges

Climate change has serious consequences on the economy of Pakistan. Natural catastrophes like as storms, droughts and floods have decimated economically productive areas such as residences, businesses and road infrastructure, creating liabilities of billions of Pakistani rupees. The floods in Pakistan in 2022 have caused a lot of destruction to the country's economy valued at USD 30 billion. Some sectors such as agriculture, energy and water resources are critical for the development and consolidation of the country, which are at risk due to climate change. Access to scarce resources will trigger political and social unrest as the impact of climate change on the economy coupled with high inflation and the increasing cost of essential goods will make people feel deprived of their resources. It is also difficult for the government to allocate adequate resources towards climate change interventions because of the combination of very high national debt, very limited financial resources, and a very fragile political situation (Nightingale, 2017).

Government Response and Climate Policy

National Climate Change Policy (NCCP). Pakistan formulated the National Climate Change Policy (NCCP) in 2021, mainly due to the increasing challenges of climate change. The plan describes the country’s main goals for climate adaptation and mitigation. It encompasses the scope of the sectors of agriculture, water, energy, and disaster-related risk management (Iacobuta, Dubash, Upadhyaya, Deribe, & Höhne, 2018). The NCCP highlights the need to strengthen community and group resilience to disasters, water and energy efficiency and preparedness for disasters, particularly for the most vulnerable. But development on the ground has been difficult for numerous reasons: financial restrictions as well as a shortage of political will and institutional competence despite the grandiose goal reflected in the NCCP. Moreover, there is a lack of

coordination and collaboration between the federal and relevant provincial governments on climate change issues. This has made the implementation of the policy challenging.

National Climate Change Authority

The Pakistan Climate Change Authority (PCCA) is the top national body of Pakistan for Climate Change, created under the Pakistan Climate Change Act (2017). It incorporates climate policies and adaptation measures together with environmental conservation. It aims to build the country's resilience against rising climate and environmental challenges like floods and water shortage, droughts and heat waves, glacial melt and glacier shrinkage. It interacts with the province and federal governments, other academic institutions, foreign organizations and the civil society on climate change programs and guarantees climate and environment concerns are mainstreamed into the developmental strategies of the country. The Authority also contributes to the implementation of the country's commitments in the field of climate change; is a source of advice for the Government on the issues of mitigation or adaptation; and supports the protection of the environment and sustainable development. The Authority is playing a pivotal role in building the capacity of Pakistan to face the challenges of climate change and create sustainable environment with integrated policies, voluntary actions and awareness programmes.

Billion Trees Tsunami Project

The Khyber Pakhtunkhwa government started the Billion Trees Tsunami Project in 2014. It is Pakistan's flagship climate project focusing on increasing the tree cover, rehabilitating degraded forests and mitigating the negative impacts of climate change.By 2020, it is said the project has successfully planted over a billion trees, making it a pioneer global reforestation project. The national level extension of the project was started in 2019 by introducing the Ten Billion Tree Tsunami Programme (Niaz, & Rose, 2025). Reforestation projects continue to play an important role in addressing challenges such as climate change, but these projects are not sufficient to address the more pressing challenge of climate change, namely climate resilience and climate adaptation.

International Climate Commitments

The Paris Agreement is the accord to which Pakistan is a signatory country along with reducing GHG emissions and making itself resilient to climate change. But Pakistan being a developing country does not have the needed financial and technological resources to meet its obligations. Climate financing and support form the basis for the country to realize its climate goals (De Coninck, Fischer, Newell, & Ueno, 2008). Pakistan has lobbied for climate justice in multilateral fora over the past few years to demonstrate the importance of financing by developed countries to support developing countries. Pakistan’s stance has also been that the countries that have contributed the least to global emissions should not have to incur the most severe consequences of climate change, and therefore, the countries should provide support for climate adaptation, loss, and damage.

Challenges for Addressing Climate Change in Pakistan

Weak Institutional Capacity

Among the issues Pakistan confronts in dealing with climate change is weak institutional capability. The climate policies and activities are hindered by Bureaucratic inefficiency, gaps in inter-governmental agency collaboration and lack of proper finance.In addition, Pakistan's regular political instability and government changes lead to a lack of policy, thus undermining long-term planning for climate change (Sewerin, Fesenfeld, & Schmidt, 2023).

Limited Public Awareness

In comparison to urban populations, the public and climate change awareness of Pakistani rural populations, whom suffer the most from the effects of climate change, is poor. Urban populations are exposed to climate related discussions, however, the natural disasters that are becoming more and more frequent are perceived by rural populations as acts of will rather than a result of climate change. The implementation of climate strategies, encouraging sustainable activities and developing resilience will remain insufficient without widespread public awareness.

Financial Constraints

The greatest barrier to changing climate is Pakistan's financial problems. The country is in serious economic difficulty, with huge debt, economic deficits and restricted access to international climate support funds. So the government is not in a position to give the required cash for climate change support and mitigation. In addition, climate change issues are exacerbated by corruption and lack of financial management (Clark, Reed & Sunderland, 2018).

THE WAY TOWARDS MANAGING CLIMATE CHANGE IMPACTS IN PAKISTAN

The dilemma of Pakistan's climate is dire, because while it accounts for a little slice of global emissions, it faces outsized risks from floods, heat waves, drought, glacier melt and water stress. One possible way ahead is to tackle both impacts and threats through adaptation (protecting people and infrastructure) and mitigation (reducing emissions and pollution).

The following are Pakistan's priorities:

Clean energy transition

Pakistan's reliance on imported fossil fuels not only increased emissions, but also fuel price volatility resulted in significant economic stress. Pakistan must use a combination of policy changes, financing, prioritizing clean technologies and active public participation, to affect a transition towards clean energy. The transition does not mean the country will have to eliminate the way the country has done things in the past; rather, it will gradually replace the sources of expensive and lethal energy with cheaper and sustainable energy (Omer, 2008). Pakistan's imports of products will be undertaken by the Alternative Energy

Development Board and the National Electric Power Regulatory Authority as follows:

- Increase solar and wind power, especially in the southern areas of Punjab, Sindh, and Baluchistan. Build transmission lines to connect the urban centers with the wind-rich rural areas. Provide private sector tax incentives and long-term contracts.
- Promote rooftop solar energy in homes, schools, farms, and industries, and lower tariffs on solar and storage batteries.
- Upgrade the electricity grid to minimize transmission losses.
- Take steps to eliminate inefficient coal and furnace oil generation plants.
- Facilitate the development of battery storage systems and microgrids in the rural geographies.

Water Management

Pakistan can address the danger of climate change and water scarcity through a combination of infrastructure enhancements, intelligent agriculture and improved governance, with a focus on climate-related adaptation. The situation is serious as it is dependent on Indus River System and facing the repercussions of Climate Change which include glacier melt and erratic monsoons, droughts, floods, depletion of ground water and rapid population development.

The interventions to be undertaken include:

- Create and sustain small and medium-sized water reservoirs.
- Advance irrigation infrastructure with the adoption of drip and sprinkler systems.
- Canal lining to control leakage of carried water.
- Better the systems of urban drainage.
- Create systems for flood prediction and early warning.
- Agroecology is of special importance in Punjab and Sindh.

Climate-Smart Agriculture

Agriculture is a major employer and very climate sensitive in Pakistan. In Pakistan, enhanced water management and resilient crops can be integrated to help build climate-smart agriculture, together with farmer education, the digital tools available, and the passage of supportive legislation. Given the large share of agriculture within the economy of Pakistan and the share of the population that is employed by agriculture, the climate risks of flooding, drought, heat and a scarcity of water have a direct impact on food security and the means of sustenance of the population (Syed, Raza, Bhatti, & Eash, 2022). The following fo measures are suggested to mitigate the effects of climate change with smart agriculture:

- Adopt crops that are heat resistant and drought resistant.
- Minimize the practice of crop burning.
- Increase the efficiency of fertilizers so as to reduce the emissions of methane and nitrous oxide.
- Advance the practice of regenerative agriculture and agroforestry.
- Utilize the mobile extension services to educate farmers.

Large Scale Reforestation and Restoration of Ecosystems

Climate change has an impact of flooding, land degradation and loss of biodiversity. Pakistan has the ability to create large scale afforestation and restoration of ecosystems through the integration of national planning along with the participation of the community, the application of scientific forestry, the management of water along with policy support of a long duration, such as the Ten Billion Tree Tsunami Program. It is pertinent for climate resilience, the security of water and the means of sustenance in the rural areas of Pakistan that we have sustainable forests along with restored ecosystems. Pakistan can do the following:

- Expand the restoration of mangroves along the entire coastline.
- Protect the forests in the North from timber mafia.
- Increase the tree cover in the urban areas of Lahore and Karachi.
- Restore the wetlands and the river ecosystems.

Climate resilient cities: Rapid urbanization is increasing pollution and heat stress

By enhancing urban planning, flood protection and management, water systems, green infrastructure, housing quality, and disaster preparedness, Pakistan can develop cities that can stand up to the challenges posed by climate change (Pauleit, Erlwein, Feder, Linke, & Zölch, 2025). Rapid urbanization and heat waves, air pollution, flooding, and inadequate infrastructure are complicating the situation for cities such as Karachi, Lahore, Islamabad, and Peshawar, and a lack of appropriate planning further exacerbates the vulnerability of cities to climate change.

They need the following:

- Stop the construction of buildings on floodplains and wetlands, and enact building laws that are sensitive to climate change.
- Build a proper mass public transport system.
- Use electric buses and cleaner fuels.
- Draw up heat action plans for when extreme heat hits.
- Build energy-efficient buildings.
- Improve infrastructure for disaster preparedness, and create waste recycling and methane capture from landfills infrastructure.

Combining the elements of planning, early warning, building, disaster resilient emergency response and policy for climate change can enable Pakistan to build climate resilient infrastructure that is disaster ready. Floods, droughts, heats and other urban disasters like glacial lake outburst floods and cyclones have become a pattern in Pakistan and preparedness for these disasters is of utmost importance. The 2022 floods served as a reminder to the country of the increased need for infrastructure and disaster preparedness.They need:

- Avoid development in flood hazard areas.
- Improve and strengthen dams and embankments, bridges, drainage and other infrastructure.
- Build up resilience to climate change through insurance for farmers and other vulnerable groups.
- Develop improved infrastructure for disaster readiness; Enhance systems and infrastructure to respond to disasters.

POLICY, GOVERNANCE AND FINANCE

Addressing climate change is a long term policy issue that if not addressed will have devastating consequences on vulnerable countries and nations. Pakistan can effectively deal with climate change only if they have a cohesive policy, governance, and finance system in three areas that are interconnected. Good policy and governance are the backbone of a nation. Climate finance is a necessity in this regard.Pakistan is vulnerable to climate change and more so against recent natural disasters, this has been shown and explained by Filonchyk, Peterson, Zhang, Hurynovich, and He in 2024 by the 2022 Incident of Pakistan Floods. As a result, this show cases the needed climate focused reforms.

- Consistent enforcement of environmental laws
- Improvement of climate and disaster risk financing plans and investments
- Increase green financial and cross border climate project partnerships
- Stimulate the private sector to invest in the clean technology
- Climate data and research funding needs to be reinforced.

PUBLIC AWARENESS AND EDUCATION

Behavioral change matters alongside policy

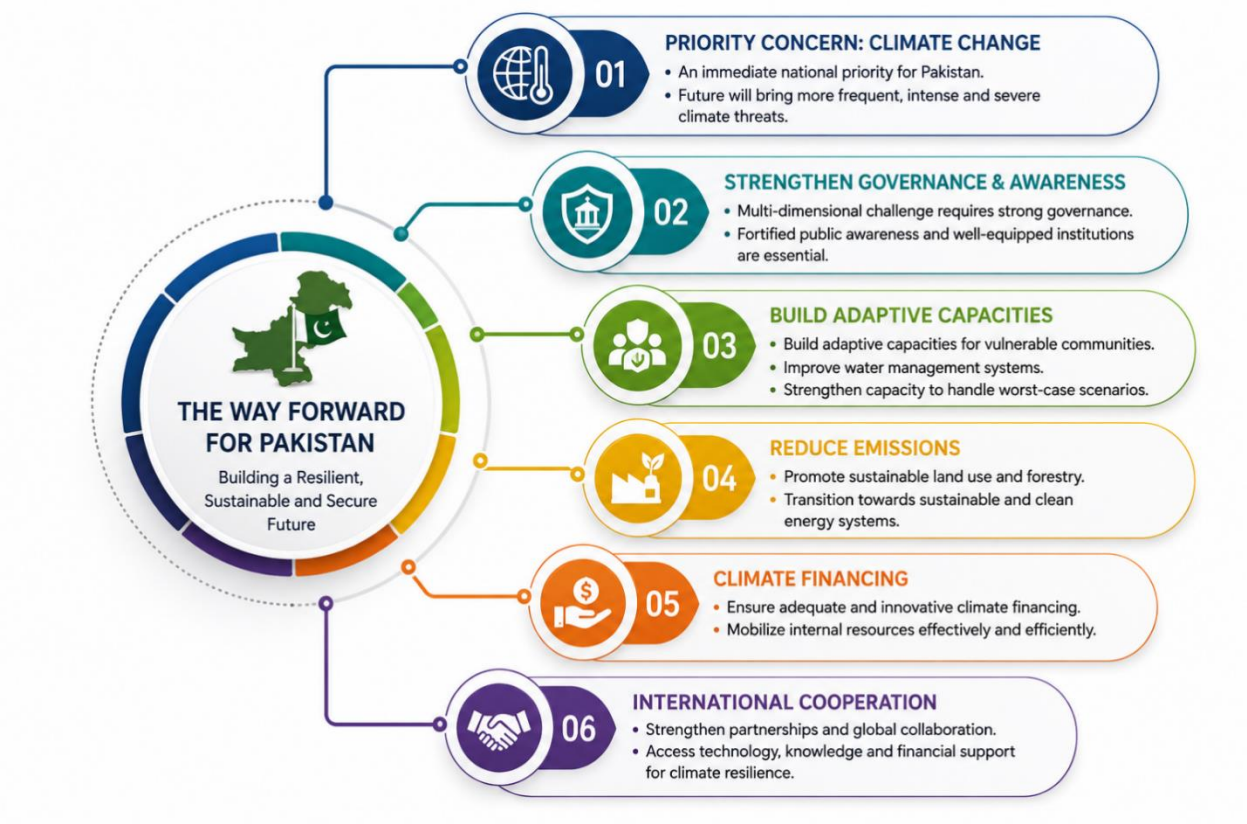
This is evident by the need to focus on climate change reforms and the 2022 Incident of Pakistan Floods. Hence, a creative approach to integrate climate change education with climate change knowledge should be thought of by Pakistan in schools. This also needs to occur in the media, community programs, outreach by the faith community, and the local governments to offer climate change education. This is crucial because climate change adaptation and environmental protection cannot only be accomplished by government action.

Pakistan is facing many problems primarily flooding, droughts and increased air and water pollution. These have been promoted and fueled by climate change. Worsening agricultural effects should also be included in these. These events, especially the floods in 2022 have shown the need for all areas to be educated on the climate.

- Save energy
- Reduce waste
- Save water
- Climate awareness in media
- Use public transport
- Update the School Curriculum to integrate climate education in all schools and universities to include the basics of climate science, water conservation, renewable energy, and forestry, Biodiversity, agriculture, and farming for sustainability in the national curriculum; Climate

education can begin at an early age and Pakistan can enact all of these and consider these in the frame of National Curriculum.

CONCLUSION



The Way Forward for Pakistan. The most important and relevant of the priority concerns, more immediate, in the short, affirmative national priorities of Pakistan, climate change. An emergent immediate concern for Pakistan is the current trends of climate and the current realities of Natural Disasters, the Pakistan of the future is poised to experience these threats in a higher frequency, intensification and with greater voracity. Climate change is a multi-dimensional, multi systemic challenge, Pakistan will need a combination of fortified, concentrated and targeted public awareness coupled with strong and best equipped Governance and the most organized and delivered Internal and External Resource Mobilization. The most immediate concern of Pakistan and the first need of climate change will be to build Adaptive Capacities for the most vulnerable communities and improve the water management systems and strengthen the capacity for dealing with the worst case scenarios. The most immediate concern of the government of Pakistan is to reduce emissions by promoting Sustainable land use and forestry and Sustainable energy systems. The first and most essential requirement will be the adequate and innovative climate financing combined with active international cooperation (Singh, Mishra, & Singh, 2026).

REFERENCES

Arif, M. I. U., & Mahsud, M. I. (2024). Disentangling Pakistan's Climate Change Governance Challenges: Trajectories and Underpinnings. *Pakistan JL Analysis & Wisdom*, *3*, 36.

https://www.researchgate.net/publication/387603527_Disentangling_Pakistan's_Climate_Change_Governance_Challenges_Trajectories_and_Underpinnings

Abrol, I., & Gupta, R. (2019). Climate change-land degradation-food security nexus: addressing India's challenge. *Journal of Agronomy Research*, *2*(2), 17-35. https://www.researchgate.net/publication/336375183_Climate_Change-Land_Degradation-Food_Security_Nexus_Addressing_India's_Challenge

Pachauri, R. K. (2012). The way forward in climate change mitigation. *Wiley Interdisciplinary Reviews: Energy and Environment*, *1*(1), 3-8. https://www.researchgate.net/publication/259684370_The_way_forward_in_climate_change_mitigation

Reyes, A. (2011). Strategies of legitimization in political discourse: From words to actions. *Discourse & society*, *22*(6), 781-807. https://www.jstor.org/stable/42890119

Miskimmon, A., O'Loughlin, B., & Roselle, L. (2012). Forging the world: Strategic narratives and international relations. https://pureadmin.qub.ac.uk/ws/portalfiles/portal/147369822/Forging_the_World_Working_Paper_2012_Final.pdf

Skinner, E., & Dancis, J. (2026). Descriptive and explanatory designs. *Human Development-Revision*. https://www.researchgate.net/publication/396603610_Talent_Identification_and_Staff_Performance_of_Public_Hospitals_in_Busia_County

Gelso, C. J. (2006). APPLYING THEORIES TO RESEARCH: The Interplay of Theory. *The psychology research handbook: A guide for graduate students and research assistants*, 455. https://www.researchgate.net/publication/364857391_The_Psychology_Research_Handbook_A_Guide_for_Graduate_Students_and_Research_Assistants

Franklin, C., & Ballan, M. (2001). Reliability and validity in qualitative research. *The handbook of social work research methods*, *4*(273-292). https://www.metodos.work/wp-content/uploads/2022/04/HandbookSWorkMethods.pdf

Mogashoa, T. (2014). Understanding critical discourse analysis in qualitative research. *International Journal of Humanities Social Sciences and Education*, *1*(7), 104-113. https://www.researchgate.net/publication/264215347_Understanding_Critical_Discourse_Analysis_in_Qualitative_Research

Kosovych, O. V., Kotovska, T. I., & Kulyk, S. A. (2022). Diplomatic communication. Discourse analysis. *Вчені записки ТНУ імені ВІ Вернадського. Серія: Філологія. Журналістика*, *33*(72), 156-160. https://www.researchgate.net/publication/394144544_deki_Depremler_ile_Ilgili_Diplomatik_Taziyelerde_Degerlendirmeler

Rasul, G. (2014). Food, water, and energy security in South Asia: A nexus perspective from the Hindu Kush Himalayan region☆. *Environmental Science & Policy*, *39*, 35-48. https://www.sciencedirect.com/science/article/pii/S1462901114000239

Yadav, A. CLIMATE EXTREMES: HEATWAVES, DROUGHTS, HEAVY RAINFALL AND HURRICANES. *CLIMATOLOGY*, 102. https://www.researchgate.net/publication/261028982_Changes_in_weather_and_climate_extremes_State_of_knowledge_relevant_to_air_and_water_quality_in_the_United_States

Althor, G., Watson, J. E., & Fuller, R. A. (2016). Global mismatch between greenhouse gas emissions and the burden of climate change. *Scientific reports*, *6*(1), 20281. https://www.researchgate.net/publication/293191701_Global_mismatch_between_greenhouse_gas_emissions_and_the_burden_of_climate_change

Khan, S. (2023). International Environmental Law Violations (In Context of Carbon Emissions) by the Industrialised and Developed Countries and its Impacts On Developing Countries; A Case Study of Pakistan. *A Case Study of Pakistan (August 18, 2023)*. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4964060

Sivakumar, M. V. (2005). Impacts of natural disasters in agriculture, rangeland and forestry: an overview. *Natural disasters and extreme events in agriculture: Impacts and mitigation*, 1-22. https://www.researchgate.net/publication/279396116_Impacts_of_Natural_Disasters_in_Agriculture_Rangeland_and_Forestry_an_Overview

Brooks, N., Adger, W. N., & Kelly, P. M. (2005). The determinants of vulnerability and adaptive capacity at the national level and the implications for adaptation. *Global environmental change*, *15*(2), 151-163. https://www.researchgate.net/publication/220023785_The_Determinants_of_Vulnerability_and_Adaptive_Capacity_at_the_National_Level_and_the_Implications_for_Adaptation

Dey, R., & Lewis, S. C. (2021). Natural disasters linked to climate change. In *The impacts of climate change* (pp. 177-193). Elsevier. https://www.researchgate.net/publication/351605230_Natural_disasters_linked_to_climate_change

Rehmat, A., Ahmad, S. M., Danish, S., Umar, A., Khaver, A., & Khan, R. M. (2023). Claiming reparation for loss and damage due to floods 2022: the case of Pakistan. *Sustainable Development Institute. https://sdpi. org/assets/lib/uploads/Claiming% 20Reparation% 20for% 20Loss% 20and% 20Damage% 20Due% 20to% 20Floods, 202022*. https://sdpi.org/assets/lib/uploads/Claiming%20Reparation%20for%20Loss%20and%20Damage%20Due%20to%20Floods%202022.pdf

Azhar, R., Asif, M., & Ahmad, S. R. ASSESSING THE ENVIRONMENTAL IMPACTS OF DROUGHTS AND DESERTIFICATION IN PAKISTAN: CHALLENGES AND MITIGATION STRATEGIES. https://pecongress.org.pk/wp-content/uploads/2025/04/Paper-No.-147.pdf

Vasin, S. M. (2023). A theoretical review of socio-economic dynamics and structural transformation of society: Traits and constraints in validating response processes due to unpredictable factors. *Economies*, *11*(7), 187. https://www.researchgate.net/publication/372299549_A_Theoretical_Review_of_Socio-Economic_Dynamics_and_Structural_Transformation_of_Society_Traits_and_Constraints_in_Validating_Response_Processes_Due_to_Unpredictable_Factors

Biemans, H., Siderius, C., Lutz, A. F., Nepal, S., Ahmad, B., Hassan, T., ... & Immerzeel, W. W. (2019). Importance of snow and glacier meltwater for agriculture on the Indo-Gangetic Plain. *Nature*

Sustainability, *2*(7), 594-601. https://www.researchgate.net/publication/334335824_Importance_of_snow_and_glacier_meltwater_for_agriculture_on_the_Indo-Gangetic_Plain

Shahbaz, M., Liaqat, B. B., & Ali, A. (2024). Effects of Climate Change on Natural Calamities in Pakistan: A Case Study of 2022 Flood. *Global Regional Review*, *9*(3), 54-63. https://www.researchgate.net/publication/384272209_Effects_of_Climate_Change_on_Natural_Calamities_in_Pakistan_A_Case_Study_of_2022_Flood

Naylor, R. L., & Falcon, W. P. (2010). Food security in an era of economic volatility. *Population and development review*, *36*(4), 693-723. https://dev.ecoguineafoundation.com/uploads/5/4/1/5/5415260/food_security_in_volatility.pdf

Damkjaer, S., & Taylor, R. (2017). The measurement of water scarcity: Defining a meaningful indicator. *Ambio*, *46*(5), 513-531. https://www.researchgate.net/publication/389055155_The_measurement_of_water_scarcity_Defining_a_meaningful_indicator

Leap, S. R., Soled, D. R., Sampath, V., & Nadeau, K. C. (2024). Effects of extreme weather on health in underserved communities. *Annals of Allergy, Asthma & Immunology*, *133*(1), 20-27. https://elischolar.library.yale.edu/cgi/viewcontent.cgi?article=2497&context=ysphtdl

Khalid, A., & Ali, S. (2020). COVID-19 and its challenges for the healthcare system in Pakistan. *Asian bioethics review*, *12*(4), 551-564. https://www.researchgate.net/publication/343744926_COVID-19_and_its_Challenges_for_the_Healthcare_System_in_Pakistan

Naser, M. M. (2011). Climate change, environmental degradation, and migration: A complex nexus. *Wm. & Mary Envtl. L. & Pol'y Rev.*, *36*, 713. https://www.researchgate.net/publication/225452578_Climate_change_environmental_degradation_migration

Nightingale, A. J. (2017). Power and politics in climate change adaptation efforts: Struggles over authority and recognition in the context of political instability. *Geoforum*, *84*, 11-20. https://www.sciencedirect.com/science/article/pii/S001671851730129X

Iacobuta, G., Dubash, N. K., Upadhyaya, P., Deribe, M., & Höhne, N. (2018). National climate change mitigation legislation, strategy and targets: a global update. *Climate policy*, *18*(9), 1114-1132. https://unfccc.int/sites/default/files/resource/476_National%20CC%20mitigation%20legislation_Talanoa%20Write%20up_Final.pdf

Sathaye, J., Najam, A., Cocklin, C., Heller, T., Lecocq, F., Llanes-Regueiro, J., ... & Winkler, H. (2007). Sustainable development and mitigation. In *Climate change 2007: Mitigation of climate change* (pp. 691-743). Cambridge University Press. https://www.researchgate.net/publication/341998848_Sustainable_development_and_mitigation

Niaz, L., & Rose, P. (2025). A Review of Scalable Education Interventions in Pakistan: Enablers, Challenges, and a Framework for Scaling. https://www.opml.co.uk/sites/default/files/2025-06/A-Review-of-Scalable-Education-Interventions-in-Pakistan-Enablers-Challenges-and-a-Framework-for-Scaling.pdf

De Coninck, H., Fischer, C., Newell, R. G., & Ueno, T. (2008). International technology-oriented agreements to address climate change. *Energy Policy*, *36*(1), 335-356. https://media.rff.org/documents/RFF-DP-06-50.pdf

Sewerin, S., Fesenfeld, L. P., & Schmidt, T. S. (2023). The role of policy design in policy continuation and ratcheting-up of policy ambition. *Policy and Society*, *42*(4), 478-492. https://academic.oup.com/policyandsociety/article/42/4/478/7276449

Clark, R., Reed, J., & Sunderland, T. (2018). Bridging funding gaps for climate and sustainable development: Pitfalls, progress and potential of private finance. *Land use policy*, *71*, 335-346. https://www.researchgate.net/publication/322255998_Bridging_funding_gaps_for_climate_and_sustainable_development_Pitfalls_progress_and_potential_of_private_finance

Omer, A. M. (2008). Energy, environment and sustainable development. *Renewable and sustainable energy reviews*, *12*(9), 2265-2300. https://www.researchgate.net/publication/227421156_Energy_Environment_and_Sustainable_Development

Syed, A., Raza, T., Bhatti, T. T., & Eash, N. S. (2022). Climate Impacts on the agricultural sector of Pakistan: Risks and solutions. *Environmental Challenges*, *6*, 100433. https://www.researchgate.net/publication/357521542_Climate_impacts_on_the_agriculture_sector_of_Pakistan_Risks_and_amicable_solutions

Pauleit, S., Erlwein, S., Feder, S., Linke, S., & Zölch, T. (2025). Climate Resilient Green Cities of the Future Building Evidence for Action. *Built Environment*, *51*(4), 588-613. https://www.researchgate.net/publication/398185075_Climate_Resilient_Green_Cities_of_the_Future_Building_Evidence_for_Action

Filonchyk, M., Peterson, M. P., Zhang, L., Hurynovich, V., & He, Y. (2024). Greenhouse gases emissions and global climate change: Examining the influence of CO2, CH4, and N2O. *Science of The Total Environment*, *935*, 173359. https://www.researchgate.net/publication/380700139_Greenhouse_gases_emissions_and_global_climate_change_Examining_the_influence_of_CO2_CH4_and_N2O

Singh, M., Mishra, G., & Singh, H. (2026). Policy Frameworks and Global Initiatives for Carbon Neutrality. In *Forestry for a Carbon-Neutral and Sustainable Future: A Scientific Perspective* (pp. 203-231). Cham: Springer Nature Switzerland. https://www.researchgate.net/publication/399354526_Policy_Frameworks_and_Global_Initiatives_for_Carbon_Neutrality