Journal of Climate and Community Development
A Double-Blind, Peer-Reviewed, HEC recognized Y-category Research Journal
E-ISSN: 3006-7855 P-ISSN: 3006-7847

Impact of Climate Change on the SAARC Region: National Security Implications for Pakistan

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Vol. *4,* ***Issue*** *1, 2025*

Article Information

Received:

2025-03-15

Revised:

2025-05-18

Accepted:

2025-06-17

ABSTRACT

One of the most urgent global challenges today is climate change, and because of its geographic, economic, and sociopolitical factors, South Asia is among the most affected regions. The study explores climate change as a non-traditional security threat to the SAARC (South Asian Association for Regional Cooperation) region, focusing especially on Pakistan. Rising temperatures, irregular monsoon patterns, melting glaciers, and extreme weather events have significant impacts on national security, food security, economic stability, and human displacement. This research is qualitative, employing environmental security theory to examine how resource disputes and geopolitical tensions shape the future of the SAARC region. Additionally, to promote Pakistan's ecological sustainability, the study concludes with policy recommendations for adaptation and potential mitigation measures. It argues that although climate change is a global, non-traditional security threat, a regional, non-traditional approach is crucial in South Asia. Furthermore, it suggests that Pakistan and India, as key players, need to move past their differences. Therefore, the effects of climate change on Pakistan are extensive, and how the country addresses this challenge will significantly impact regional stability and prosperity, both broadly and specifically for Pakistan.

Keywords: *Climate Change, SAARC, Non-traditional Security, Environmental Security Theory, Indo-Pak Rivalry, Water Wars.*

Citation: APA

Nawaz, N., Akhtar, H & Zafar, S, A. (2025). Impact of climate change on the SAARC region: National security implications for Pakistan, Journal of Climate and Community Development, 4(1), 244-253.

Introduction

SAARC is the least integrated region, a zone of potential nuclear risk, and therefore the most affected by the devastation caused by climate change. It is home to twenty-five percent of the world's population, with India having the largest population. Globally, climate change has shifted from a potential threat to a significant reality, and although its impact is universal, developing countries are affected the most (Abd El-Azeem, 2025). The inadequate governance systems and lack of a bilateral approach in Pakistan and India are also deepening the impacts of climate change on the smaller countries of South Asia. The diverse geography of South Asia makes it a hotspot for climate-related risks. The region has three landlocked countries: Bhutan, Nepal, and Afghanistan. Afghanistan provides a gateway to Central Asia and the Middle East (Khan et al., 2025). The melting glaciers of the Himalayas, which supply major river systems like the Indus, Ganges, and Brahmaputra, are melting rapidly due to global warming. For millions of people who rely on these rivers for hydropower and agriculture, this situation threatens their water security. Even though coastal regions face an existential threat from rising sea levels, especially in Bangladesh and Pakistan, where a large portion of the population lives in low-lying areas (Yadav et al., 2025).

The Indo-Pak rivalry, an obstacle to sustainable peace in the region; therefore, the two countries' heavy reliance on agriculture and water conflicts coexist, creating a non-traditional security dilemma. The two countries have already fought multiple times over the disputed territory of Kashmir. Since non-traditional security threats have surpassed traditional security threats, climate change has brought about socio-economic and political hazards globally and regionally (Khan, 2025). Water and cross-border terrorism are the two long-standing issues that have led to conflict escalation. This suggests that non-traditional security issues will cause future conflicts. Despite its historical resilience, the Indus Water Treaty between India and Pakistan is under pressure as melting glaciers and changing rainfall patterns alter river flows. With both countries accusing each other of neglecting international resources, water scarcity could worsen interstate conflicts (Rathod, 2023). While the recent escalation of the Indo-Pak conflict in 2025 is also a result of a non-traditional security threat, which led to full-scale war. Pakistan and India are the two major contributors of greenhouse gases in South Asia, and Pakistan, in particular, is at the forefront of climate concerns because of its geography, socioeconomic vulnerability, and poor infrastructure, which suffers severely despite contributing less than 1% of the world's greenhouse gas emissions whereas nearly 40% of the workforce employed and 20% of GDP generated by agriculture, the sector plays a vital role in the country's economy. Water shortages, prolonged heat waves, and unpredictable rainfall patterns are reducing harvests, increasing food insecurity, and pushing rural populations into poverty (Mahmood, 2025). Pakistan and the larger South Asia region face considerable political and security implications related to climate change. Pre-existing tensions are exacerbated by environmental struggles, especially as they relate to shared water resources. The increased risks from rising temperatures, unpredictable monsoon patterns, melting glaciers, flooding, prolonged droughts, and the lack of an effective strategy for combating climate change are paramount environmental challenges that have significant social, political, and security consequences. The SAARC is highly affected by the occurrence of severe weather events in the region (Wang et al., 2025). For example, widespread flooding displaced more than thirty-three million people in Pakistan, submerged a third of the country's land area, and caused economic losses of nearly thirty billion dollars. However, this research examines the impacts of climate change in the SAARC states, particularly in the context of these significant challenges for Pakistan. Also investigates Pakistan's adaptive capacity, enforcement laws, and regional cooperation to mitigate negative environmental threats through the theory of environmental security. Further, theory highlights how state resource depletion and environmental degradation play a significant role in increasing regional conflicts and instability. Therefore, theory places Pakistan's environmental challenges within a geopolitical framework and emphasizes the complexity between social, economic, environmental, and security challenges in the region even the research includes the urgent need for comprehensive mitigation for climate

adaptation to these key challenges in line with the theory that when nations fail to control challenges such as food security or water scarcity, they become more deprived. In the case of Pakistan, climate change, as a "threat multiplier," has led to pre-existing risks related to economic inequality, ethnic divisions, and governance.

Theoretical Framework

In the 1980s, the Brundtland Commission, Jessica Tuchman Matthews, and Richard Ulman were researchers who discussed the meaning of conservation, environmental threats to humans and the environment, sustainable development, and environmental degradation. The theory of environmental conservation focuses on the ecological imperative for sustainable development, discussing environmental change and conflict (Dyer, 2001).

In recent decades, awareness of the significant threat posed by climate change has gained national and international attention. The environmental security theory of international relations provides an important framework for understanding the social, political, and security impacts of climate change in South Asia. Applying the theory allows for an understanding that climate change requires precautionary measures because security issues such as internal displacement, food insecurity, and water scarcity are threatening the region, and more sustainable measures are needed to reduce risks (Fisher, 2025).

The idea of environmental protection is particularly relevant to Pakistan, where political, social, and economic conflicts predating climate change are escalating and threatening national security, economic stability, and human security. Pakistan is highly vulnerable to the impacts of climate change, particularly rising temperatures, changing rainfall patterns, and increasing frequency of extreme weather events, due to its geographical location, economic conditions, and social structure which emphasizes the relevance of pursuing a broad and collaborative approach to addressing the environmental crisis, which has led to an emphasis on the need for global cooperation, deep climate adaptation strategies, and sustainable governance.

By applying this theory, we analyze conflict potential, identify Pakistan's climate risks, and determine mitigation and adaptation measures because growing recognition of the critical linkages between non-traditional security has increased the objectives of the analysis, regardless of the need for international cooperation, comprehensive climate adaptation strategies, and sustainable governance. The optimistic method, which uses measurable facts and empirical evidence to explore the relationship between environmental change and conflict, is a key perspective that informs environmental conservation theory. Furthermore, while acknowledging the essential part that individual agency plays in determining security outcomes, the agency-based perspective highlights how important it is to understand individual experiences and capabilities to manage their security.

However, international cooperation is needed to mitigate the root causes of the climate crisis, transfer effective methods and practices, and support vulnerable countries like Pakistan, because Cities such as Karachi and Lahore, already grappling with insufficient infrastructure and joblessness, encounter increased dangers of social disintegration as rural migrants escape climate-impacted regions. This corresponds with EST's caution that large-scale displacement may undermine governance and exacerbate sectarian or ethnic conflict, especially in vulnerable states with limited institutional strength. Additionally, Pakistan's energy instability, caused by its dependence on climate-sensitive hydropower, highlights another aspect of environmental security. Extended droughts, like those occurring in Balochistan, hinder electricity production, resulting in power outages that paralyze industries and fuel public unrest, a situation EST describes as an element of the "energy-security-climate nexus."

Opponents of EST argue that it could lead to militarization rather than sustainability, which is why it could lead to security. For example, presenting water scarcity as a national security threat that could pose a threat to the region, demanding a cooperative response. But applying EST to climate change mitigation measures is beneficial for Pakistan because environmental threats are developmental and strategic issues. This theory also highlights the climate risks for the South Asian region and the need for regional

cooperation on conflicts and diplomacy. Furthermore, the environmental theory suggests that climate is a global problem and the world needs global cooperation and coordinated action.

From this perspective, research within EST, Pakistan's vulnerabilities to disaster preparedness, also promotes a holistic approach to renewable energy transitions, and regional cooperation on humanitarian and security crises in the world's most climate-vulnerable regions. Stakeholders and policymakers can rapidly develop effective strategies and programs to address environmental issues, enhance national security, economic stability, and human security, and ensure the sustainable development of Pakistan.

Results & Discussion

Climate Change and South Asia: Regional Overview

South Asia is home to one-third of the world's most populous region and faces multiple environmental challenges due to its geographical location and the region's vulnerability to climate change, such as droughts, floods, and earthquakes, damaging infrastructure and residents. Notably, 33 million people were affected by Pakistan's floods in 2022, while cyclones like Amphan (2020) and Aila (2009) frequently strike Bangladesh and India. The 2022 heat wave in India reduced wheat production, and the floods in Pakistan diminished rice production. These extreme weather events further reduce agricultural output (Masood et al., 2025). Another major problem is water scarcity, as monsoons and droughts increase water stress, and the receding Himalayan glaciers block streams. Over the past two decades, the water crisis caused by climate change has affected nearly 750 million South Asians. By 2050, there are predicted that be 13 million climate migrants, posing significant risks to coastal areas, especially those downstream of Bangladesh and the Maldives. Furthermore, the significant impacts of climate change are evident in matters of safety, particularly droughts that induce cardiovascular stress and the spread of diseases caused by vectors generated by rising temperatures. Heat-related deaths in India increased by 55% from 2000 to 2021 (Nepal et al., 2025). To highlight the passage on how rapid climate mitigation and adaptation strategies must be developed sustainably to reduce regional risks. Climate change is exacerbating transboundary river conflicts, such as the Ganges River between India and Bangladesh and the Indus River between India and Pakistan. Urgent regional cooperation is needed to mitigate the impacts of climate change that affected transboundary waters. This leads to disputes over the distribution of irrigation water, particularly during droughts. Deforestation and salt intrusion are harming the mangrove forest of the Sundarbans, which spans Bangladesh and India, jeopardizing both countries' resilience to tropical cyclones (Rathnasiri et al., 2025). Another concern is climate change, which could intensify internal displacement tensions and cross-border movements in areas like Dhaka and Mumbai, potentially escalating hostilities, as seen in cross-border disturbances in Assam. Shifts in monsoon patterns and melting glaciers indicate regional weather changes that affect hydropower and agriculture in Nepal, India, and Pakistan. India's agricultural income is severely impacted by erratic rainfall and regional commodity trade (Shewly, 2025). Despite initiatives like the South Asia Hydro Meteorological Forum for the exchange of weather data, political differences and insufficient funding continue to hinder cooperation. Bangladesh has made strides in cyclone preparedness, but the regional early warning system remains underfunded, highlighting the need to reinforce regional collaboration to address South Asia's collective climate challenges. Effective cooperation and collaboration are vital for mitigating the impacts of climate change and promoting sustainable development in the region.

1.3. Case Examples from South Asia

South Asia's vulnerability to extreme weather events is regularly emphasized by several dangerous weather disasters that have recently affected the region. Cyclone Bhola in 1970, which killed 500,000 people in East Pakistan, now Bangladesh, is a historical event that highlights the link between climate disasters and regional instability (Santra & Pradhan, 2025). Unexpected rainfall caused the 2022 floods in Pakistan, which flooded nearly a third of the country, displaced eight million people, caused food shortages, and caused $15 billion in damage (Masood et al., 2025). This instance highlights the region's catastrophic variations in precipitation. For instance, the issue of the Farakka Barrage in the

India-Bangladesh water-sharing dispute over the Ganges River highlights how climate-induced droughts affect the ecosystems and agriculture of both countries, intensifying the political conflict. Furthermore, with temperatures exceeding 50 degrees Celsius in 2022, drought has had devastating effects on India and Pakistan, resulting in reduced wheat production, increased energy consumption, and multiple cases of heatstroke (Sajjad, 2025).

a. Increasing intensity of Bengal cyclones

Bangladesh is a South Asian country with a population of over 166 million, a region of low-lying deltas, rivers, and fertile plains, and an economy focused on textiles, agriculture, and remittances. Coal, fertile soil, and natural gas are among the country's natural resources. Bangladesh's agriculture, infrastructure, and human settlements are all affected by the increasing frequency and intensity of cyclones, floods, and droughts, making it highly vulnerable to climate change whereas, coastal and deltaic regions experience significant impacts from climate change on livelihoods and economic progress, as rising sea levels and saltwater intrusion jeopardize the nation's food security (Qiu et al., 2025).

b. Shifting Rainfall Trends in Sri Lanka

Sri Lanka, an island nation in the SAARC region, is recognized for its extensive landscape and rich cultural legacy. The nation's terrain consists of mountains, woodlands, and a shoreline, while its natural assets feature tea, rubber, and precious stones. Boasting a population of around 22 million individuals, the economy heavily relies on tourism, textiles, and agriculture, while Sri Lanka's infrastructure, water supply, and agriculture have all been severely affected by climate change, which has led to floods, droughts, and cyclones. Human health, tea plantations, and wildlife are all being severely affected by rising temperatures and changing rainfall patterns (Samjhana et al., 2025).

c. Mitigation of the Maldives tourism

The Maldives, an island paradise made up of 1,192 coral atolls, is an example where tourism plays an integral part in the economy. The Maldivian population is being displaced, livelihoods are being lost, and islands are collapsing as a result of rising sea levels, intense storms, and coral bleaching caused by climate change. Given its limited land area and potential for sea level rise, the country is particularly vulnerable to climate change (Prabheesh & Rasheed, 2025).

d. Excessive glacier melting in Bhutan causes floods

Bhutan is a small landlocked nation in the heart of the Himalayas, with a population of just 771,608, and is renowned for its wild landscapes. The country's rugged mountains are home to a variety of natural resources, including timber, minerals, and hydroelectric potential. Bhutan's economy relies mainly on its valleys, forests, hydroelectric power, tourism, and farming, this susceptible to climate change, potentially altering temperature and rainfall patterns, affecting agriculture and water resources, and causing flooding from glacial lakes because Bhutan's unique cultural heritage and sustainable development rely on climate adaptation and resilience, as its glaciers, biodiversity, and hydroelectric capabilities face threats from increasing temperatures (Samjhana et al., 2025).

e. Threatening effects on Nepal

Nepal is a landlocked nation situated in the Himalayas with approximately 30 million residents. it is appreciated for its diverse cultural legacy and stunning natural beauty. The nation has natural assets such as minerals, forests, and hydropower potential, and its landscape features rugged mountains, hills, and scenic valleys. Nepal’s economy relies on agriculture, tourism, and hydropower. Nepal is extremely susceptible to the effects of climate change. The droughts, landslides, and floods are all jeopardizing its water supply, agriculture, and infrastructure (Maharjan et al., 2025). Nepal’s glaciers, wildlife, and human habitats require urgent action to address the growing threats. Rising temperatures are putting settlements at risk.

f. Afghanistan’s livestock and food scarcity

Afghanistan, a country without coastal access, has historically been a focal point of international strife. Afghanistan, home to more than 38 million people and an economy predominantly centered on agriculture, livestock, and natural resources like copper, iron ore, and gemstones, is

particularly susceptible to climate-induced disasters such as floods and droughts. These events can worsen ongoing issues like poverty, hunger, and displacement, adding additional pressure on the nation's resources and resilience (Samiappan et al., 2025). Which highlights the essential requirement for resilience and climate adaptation strategies. Additionally, tribal disputes are more frequent in the unstable Afghanistan, and the uneven allocation and scarcity of resources may provoke civil war

Implications for Pakistan

Climate change is altering Pakistan's natural and socio-economic conditions, presenting serious environmental obstacles. With the increasing frequency of severe weather events like catastrophic floods and extended heat waves, the evacuation and healthcare systems are facing pressure

2.1. Environmental threats

The 2022 floods highlighted the country's climate extremes, displacing 8 million people and affecting 33 million, with temperatures during that period reaching 50°C. Another major issue is water scarcity, as melting Himalayan glaciers and erratic monsoons threaten water security. (Ammar et al., 2025). However, by 2025, Pakistan is projected to face "complete water scarcity" with poor water quality in several areas, including Sindh and Gilgit. Therefore, Climate change has also had a huge impact on health (Mansoor, 2025). Droughts and floods are causing the spread of diseases like dengue and respiratory illnesses. Heat-related deaths go unreported due to a lack of data collection, and air pollution can shorten life expectancy by up to four years Ecosystem degradation, including the loss of mangroves in the Sundarbans and coastal erosion in Gwadar, increases the likelihood of storms and hurricanes, displacing countless people every year (Ammar et al., 2025). To mitigate the negative impacts of climate change and advance sustainable development in Pakistan, these environmental threats emphasize the importance of urgent and sustained action.

2.2. Socioeconomic consequences

Even with their extensive effects, Pakistan's failures in climate and governance are exacerbating socio-economic inequalities. Climate-related disasters have caused substantial financial damages, with around billions of dollars in losses and an 18-20% decline in GDP due to climate deterioration over the last two decades. 45% of the population relies on agriculture and is influenced by climate change. Erratic rainfall and droughts significantly impact crop yields (Yousaf et al., 2025). Even during the 2022 heatwave, wheat yields fell drastically, leading to economic instability and impacting food security. Moreover, climate change has placed pressure on urban regions such as Karachi and Lahore, resulting in poverty and displacement (Asif & Sheikh, 2025). Moreover, engagement in essential technologies in Pakistan is restricted because of the digital divide, which also hinders prospects for economic and educational growth. As the nation progresses with 5G rollout, issues are intensified by varying policies and insufficient funding (Khan et al., 2025). By investing in digital infrastructure, social protection, and climate resilience, Pakistan can promote more sustainable and equitable growth while reducing the effects of climate change. These socio-economic effects of climate change highlight the pressing necessity for targeted efforts to enhance sustainable development and tackle Pakistan's fundamental vulnerabilities.

2.3. Political and Security Dynamics

Pakistan's political and security landscape is complex, marked by domestic turmoil and geopolitical tensions that lead to unusual threats. Diplomatic ties with India are declining, driven by border disputes arising from attempts to restrict Pakistani content for national security concerns. In terms of internal issues, terrorism presents major difficulties, as entities such as the Tehreek-e-Taliban Pakistan (TTP) and the Islamic State Khorasan (IS-K) rank highly among Pakistan's key security threats. It has diminished public confidence in officials and fostered radicalism in regions like Peshawar. Furthermore, new developments like artificial intelligence and autonomous weapons increase the nation's susceptibility to cyberattacks on banking, communication, and critical infrastructure (Schroden, 2025).

In geopolitics, Pakistan faces challenges from India's military might as well as the needs of China and the United States, which compromise its strategic independence. Pakistan's National

Security Policy 2022-2026, which places utmost importance on citizen-centric security, economic diplomacy, and an innovative foreign policy approach, further enhances this delicate relationship. However, critics claim that the policy's focus on increasing the amount of national resources for the military could compromise its goal of ensuring equitable and sustainable economic growth (Cheema, 2025). Overall, Pakistan's security concerns require an effective plan that stimulates economic growth and effective governance while addressing traditional and non-traditional threats.

2.4. Institutional and Governance Challenges

The major challenges facing Pakistan's institutional capacity and governance have put the nation at greater risk from external threats. Political interference, signaled by hastily approved constitutional amendments and military oversight of economic institutions such as the Special Investment Facilitation Council (SIFC), is undermining fragile structures, including parliament and the judiciary. Since the State Bank operates without the necessary governance, the Federal Board of Revenue (FBR) is vulnerable to political manipulation, which slows down the economy and limits economic stability. The inconsistent implementation of emission restrictions and adaptation efforts, regardless of the outcome of the Ten Billion Tree Tsunami-related measures, underscores the shortcomings of environmental policy (Yousaf et al., 2025). Underestimating climate-related deaths and poor agency coordination hinder disaster mitigation, worsening climate change impacts.

A Way Forward to Mitigate Climate Risks in Pakistan

a. Creation of an Environmental Security Council

Climate monitoring system should be Pakistan's primary goal if it is going to effectively address the critical issue of climate change, and this can be done through adopting key measures like strengthening climate governance, enhancement in adaptation measures, promoting regional cooperation, and green energy transitions. The National Climate Change Policy (2021) must be fully implemented. If this strategy is implemented effectively, Pakistan's development path will become more environmentally resilient, as it offers a broad framework for addressing climate-related concerns. By recognizing climate change as a fundamental aspect of national security, this Council will improve policymaking and decision-making by strengthening environmental governance. (Rehman et al., 2025). Pakistan could reduce the risks and further prepare for the adverse impacts of climate change.

b. Investing & Innovation in climate-resilient agriculture

Pakistan must prioritize increasing adaptation measures to mitigate the impacts of climate change, while strengthening environmental governance at the national level. Increasing climate resilience, growing drought-tolerant crops, and using efficient watering methods such as drip irrigation can all help achieve the goal through the adoption of these strategies, Pakistan's agricultural industry will be more capable of tackling the adverse effects of climate change, securing food supply, minimizing risks for farmers, and promoting the establishment of systems for early warning against disasters and severe weather (Khan et al., 2025). By utilizing this system, officials can promptly alert impacted regions, enable evacuations, and implement additional required actions.

c. Need for revival of SAARC

Given that climate change is a worldwide concern, Pakistan ought to promote regional collaboration to tackle its challenges effectively in local settings by leveraging climate specialists and diplomatic strategies. A crucial matter is the termination of the Indus Waters Treaty with India. Settling could prevent resource conflicts between Pakistan and India. It serves as a vital framework for coordinating water resources within the region. Furthermore, Pakistan and the South Asian Association for Regional Cooperation must work together to promote climate adaptation efforts (Hossain et al., 2025). Through this approach, Pakistan can secure financial and technical support to alleviate the adverse effects of climate change. Pakistan can enhance its ability to cope with the effects of climate change by fostering regional collaboration and leveraging the expertise and resources of its neighboring nations**.**

d. Renewable Energy for Sustainable Progress

Pakistan must emphasize green energy in its

national plans to decrease reliance on fossil fuels and adjust to the impacts of climate change. The China-Pakistan Economic Corridor (CPEC) has enabled the integration of renewable energy in Pakistan, and the government must focus on promoting solar and hydropower initiatives. Pakistan can improve energy security, decrease greenhouse gas emissions, and foster sustainable economic growth by shifting to green energy (Bensadi, 2024). In addition to this, Pakistan can achieve its objectives of social and economic growth while safeguarding the environment and maintaining a rate of development that is sustainable and resilient to climate change.

Conclusion

In summary, the effects of climate change in the SAARC region, especially in Pakistan, are a major concern that requires urgent attention and action. The environmental security theory suggests that climate change presents a significant risk to Pakistan due to its deep impact on water security, agriculture, and national stability. Climate change could increase conflicts, weaken political institutions, and threaten the country's stability. Pakistan needs comprehensive measures for both mitigation and adaptation to protect its stability, given the fragile circumstances. Its vulnerability to climate change is a critical security issue that needs immediate focus and response. Now is the time for Pakistan to take decisive steps to address its climate-related challenges and secure its future. An inclusive approach emphasizing climate-resilient growth, boosting regional cooperation, and promoting sustainable resource management can make this possible. Ultimately, Pakistan's ability to address the impacts of climate change is vital for its prospects. By prioritizing climate action and developing effective policies, Pakistan can reduce the threats of climate change and ensure a safer, more prosperous future for its people. Immediate action is essential for Pakistan to confront climate change and protect its resources.

Conflict of Interest

The authors showed no conflict of interest.

Funding

Funding

The authors did not mention any funding for this research.

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