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Climate Change as a Threat Multiplier: Impacts on South Asian Political Stability

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ABSTRACT

This quantitative study investigates climate change as a threat multiplier to political stability in South Asia, focusing on Pakistan, India, Bangladesh, and Afghanistan from 2000 to 2025. Using longitudinal data from the World Bank Governance Indicators, ERA5 climate reanalysis, and the EM-DAT disaster database, the analysis examines trends in temperature anomalies, extreme weather events, and political stability scores. Pearson correlation results show strong negative relationships between temperature anomalies and political stability, especially in Pakistan ($r = –0.72$) and Afghanistan ($r = –0.65$), indicating that climate variability worsens governance challenges in fragile states. The frequency and intensity of extreme events—such as the 2022 Pakistan floods and 2024 Bangladesh heatwave—demonstrate a clear upward trend, with recent 2025 monsoon floods in Pakistan and India emphasizing the urgent need for climate adaptation measures. Findings suggest that rising climate hazards interact with social and political vulnerabilities to increase instability, calling for integrated climate-security policies and regional cooperation efforts. This study adds to the literature on climate-security linkages by providing empirical evidence from a high-risk geopolitical region, offering valuable insights for policymakers, international organizations, and security planners working to build resilience against escalating climate threats.

Keywords: *Climate change, Political stability, South Asia, Pakistan, India, Bangladesh, Afghanistan*

BACKGROUND OF THE STUDY

Climate change has emerged as a multifaceted global challenge that transcends environmental degradation, increasingly being recognized as a "threat multiplier"—an accelerant of existing socio-political, economic, and security vulnerabilities, particularly in fragile and conflict-prone states (Ruttinger & Nett, 2021; Zahoor, 2024). In South Asia—home to approximately 750 million people affected by

climate-related disasters over the past two decades—the region faces mounting pressure from intensifying heatwaves, monsoon variability, glacial melt, flooding, and drought (World Bank, 2024). The consequences are increasingly visible in Pakistan, India, Bangladesh, and Afghanistan, where climatic stressors amplify political instability by aggravating resource scarcity, food insecurity, economic strain, and social fragmentation (World Bank, 2024; Zahoor, 2024).

Climate Stressors and Regional Vulnerabilities

South Asia's reliance on monsoon-dependent agriculture, glacial waters, and densely populated coastal areas makes it particularly sensitive to climate shocks. The region is witnessing a "new climate normal" characterized by recurring floods, droughts, cyclones, and extreme heat (World Bank, 2024). More than half of the South Asian population—nearly 750 million—experienced at least one climate-related disaster in the past twenty years (World Bank, 2024). In this volatile context, climate stressors can rapidly translate into political liabilities when institutions are unable to absorb or adapt to sudden shocks.

Pakistan consistently ranks among the top ten countries worldwide most vulnerable to climate risk (CRSS, 2025). In 2022 alone, devastating floods impacted over 33 million people, resulting in nearly 1,700 deaths and causing damage equivalent to approximately 4.8% of the national GDP (CRSS, 2025; Wikipedia, 2025). These floods disrupted livelihoods, heightened food insecurity, and significantly weakened institutional capacity, turning climate-related events into catalysts for political and economic instability (CRSS, 2025; Wikipedia, 2025).

Afghanistan faces multiple intersecting threats from temperature increases, extreme drought, and glacial retreat (Wikipedia, 2025). Since 1950, the country has experienced a warming of approximately 1.8 °C. Drought and land degradation now affect more than half the population, with desertification compromising agricultural productivity (Wikipedia, 2025). Flash floods further compound instability: a 2018 glacial lake outburst in Panjshir Valley alone killed several people and destroyed homes (Wikipedia, 2025). These environmental shocks unfold amid political fragility and insurgent activity, elevating climate change to a potential trigger of conflict (Ruttinger & Nett, 2021).

Bangladesh's geographical vulnerability—lying low and flat, with only about 10% of land more than one meter above sea level, and intersected by the Ganges, Brahmaputra, and Meghna rivers—makes it highly susceptible to flooding, cyclones, and storm surges (Wikipedia, 2025). Between 1980 and 2008, the country experienced over 200 natural disasters, including deadly cyclones in the 1960s and 1990s, as well as Cyclone Amphan in 2020 (Wikipedia, 2025). Sea-level rise and increasingly intense storm tides threaten to worsen by the century's end (Qiu, Ravela, & Emanuel, 2023). These hazards heighten socio-economic disparity and strain the state's capacity to maintain political stability.

While India faces similar climate pressures, including monsoon variability and glacial melt, its sheer demographic size and regional disparities yield complex outcomes. Erratic monsoon patterns, declining rainfall in central India, and glacier retreat pose severe threats to agricultural output and rural livelihoods (Wikipedia, 2025; World Bank, 2024). Transboundary water conflicts, notably over the Indus and Brahmaputra rivers, are framed by geopolitical rivalries and climate stress (South Asia Times, 2024; Zahoor, 2024).

Climate as a Political Security Threat

The concept of climate change as a threat multiplier is well established in security and IR literature (Ruttinger & Nett, 2021). In contexts where governance is weak or exclusionary, climate-induced resource scarcity fuels social unrest, displacement, competition over land, migration pressures, and insurgency. In Pakistan, for example, climate shocks have been linked to rising recruitment by violent non-state actors amid worsening water stress and economic deprivation (CRSS, 2025; Ali, 2017). In

Afghanistan, conflicts between the Kuchi and Hazara pastoralist communities over grazing rights have been exacerbated by land degradation and shrinking resources (Ruttinger & Nett, 2021).

Furthermore, the melting of glaciers in the Upper Indus Basin has reduced Pakistan's water security, amplifying inter-state tensions, particularly with India over transboundary water sharing under the Indus Waters Treaty (Zahoor, 2024). These multi-scalar impacts emphasize how climate stress magnifies political fault lines both within and between states.

Research Gap and Contribution of the Present Study

Despite growing recognition of climate change's destabilizing potential, empirical quantitative research linking specific climate indicators (e.g., temperature anomalies, flood frequency) to political stability remains limited, particularly across South Asia's most climate-vulnerable countries. Existing studies tend to focus on single cases (e.g., Pakistan or Afghanistan) or are qualitative (Ruttinger & Nett, 2021; Zahoor, 2024). This study bridges that gap by employing panel data analysis across four countries—Pakistan, India, Bangladesh, and Afghanistan—from 2000 to 2025.

By correlating climate variables (temperature, precipitation variability, extreme events) with political stability measures (governance indices, conflict incidence, institutional performance), this research quantifies the extent to which climate stress exacerbates political instability. The empirical evidence generated can inform transnational policy efforts, climate resilience strategies, and security planning.

Aim of the Study

The primary aim of this study is to quantitatively examine the impact of climate change as a threat multiplier on political stability in Pakistan, India, Bangladesh, and Afghanistan from 2000 to 2025. Specifically, the research seeks to analyze the relationship between climate stressors—such as temperature anomalies, precipitation variability, and the frequency of extreme weather events—and key indicators of political stability, including governance performance, conflict incidence, and institutional resilience. By generating empirical evidence, the study aims to enhance understanding of how climate-related pressures exacerbate existing political vulnerabilities and to provide insights for integrating climate resilience strategies into national security and regional cooperation frameworks.

Research Questions

1. To what extent do climate change indicators—such as temperature anomalies, precipitation variability, and the frequency of extreme weather events—affect political stability in Pakistan, India, Bangladesh, and Afghanistan from 2000 to 2025?
2. Which specific climate stressors have the strongest statistical association with governance disruptions, conflict incidence, and institutional performance in the selected countries?
3. How does the magnitude of climate change's impact on political stability vary across Pakistan, India, Bangladesh, and Afghanistan?
4. What policy implications can be drawn from the quantitative relationship between climate change and political stability to strengthen national security and regional cooperation frameworks?

LITERATURE REVIEW

Climate Change as a Threat Multiplier in South Asia's Security Landscape

Climate change increasingly magnifies existing vulnerabilities within fragile political systems, functioning as a "threat multiplier" that heightens social, economic, and governance-related insecurities (Center for Strategic Risks, 2023). In Pakistan, the catastrophic 2022 floods—attributed to climate change—displaced some 7.9 million people, destroyed over 287,000 homes, and highlighted the

compounded intersection of environmental shocks and governance failure (Gul et al., 2025). These events have undermined institutional legitimacy, with military forces diverted to humanitarian duties and public trust eroding as governmental capacity proved insufficient during the crisis (Adil & Haider, 2023).

Studies further show that climate disasters in Pakistan are not limited to physical loss; household and societal resilience have sharply declined. The proportion of Pakistanis reporting a lack of governmental concern increased from 60% in 2021 to 72% by 2023, particularly in flood-affected regions (Gul, 2024), as reported by Voice of America. Such trends underscore how environmental disasters degrade confidence in state capacity, exacerbating political instability. Although Pakistan introduced its National Climate Change Policy in 2012, which has since been revised by successive administrations. The country also takes an active role in international climate change discussions and remains committed to fulfilling its obligations. Despite global progress in adopting effective mitigation and adaptation strategies, Pakistan's climate governance remains inadequate, leaving the country increasingly vulnerable to climate-related challenges. (Dr Nadia Zaheer Ali 2024)

Similar patterns emerge in Bangladesh, where climate variability—rising sea levels, cyclones, and extreme storm tides—threatens core elements of human security, including food, water, health, and livelihood systems (Qiu, Ravela, & Emanuel, 2023; Institute of Geography, University of Hamburg, 2024). Although less directly tied to governance breakdown, these projections suggest the potential for future destabilization through resource depletion and mass displacement.

Climate Risk and Human Security Impacts

Quantitative research linking climate variables to socio-political outcomes in South Asia is limited but evolving. In Bangladesh, systematic mapping of climate change impacts reveals well-studied threats to food, water, economic, environmental, and health security, particularly in rural areas. However, it highlights critical gaps related to energy security and conflict pathways (Institute of Geography, University of Hamburg, 2024).

Advances in climate risk modeling now allow higher-resolution forecasting. Qiu et al. (2023) project that Bangladesh's 100-year storm tide could intensify significantly by the end of the century, increasing both the magnitude and frequency of extreme events—heightening vulnerability in densely populated coastal regions (Qiu et al., 2023). Complementary research employing statistical-physical downscaling and machine learning further identifies rising extreme rainfall risk across Bangladesh, especially in the northeast, with extreme daily precipitation projected to increase by around 50 mm per day by mid-century (Saha & Ravela, 2024).

In Pakistan's case, remote sensing studies quantify the spatial extent of 2022 flood damages, identifying catastrophic crop losses, urban destruction, and delayed planting in subsequent seasons—information crucial for modeling socio-political stress (Younas et al., 2024).

Governance, Political Stability, and Climate-Induced Stressors

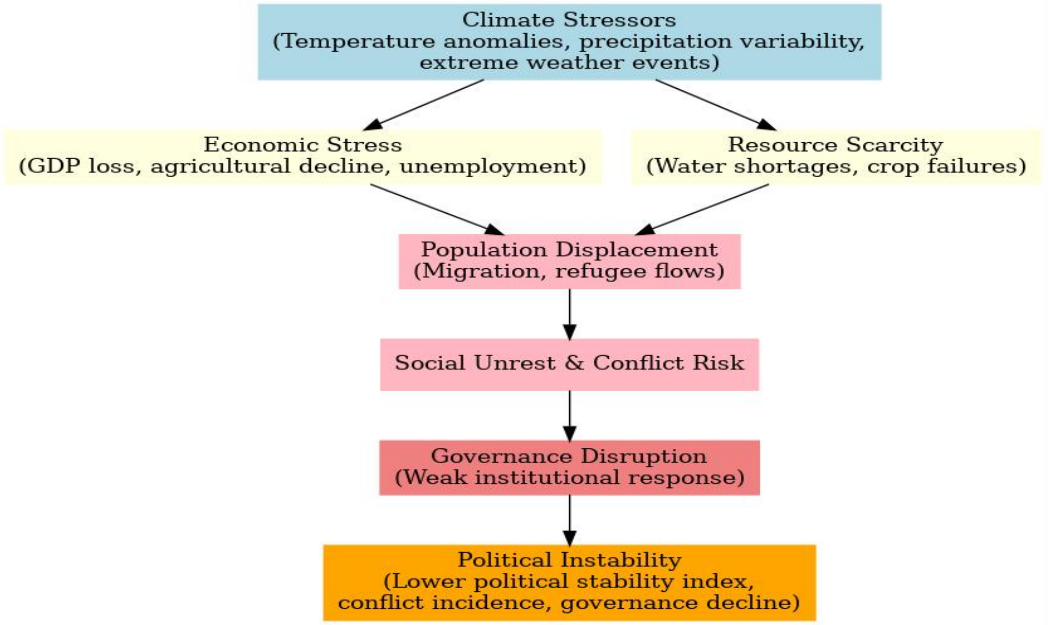
Research consistently links climate hazards with erosion of governance and political stability. A 2015 report highlighted how melting glaciers and the resultant floods threaten the Indus Basin's water reliability, undermining the government's legitimacy when disaster response proves ineffective, thereby fracturing the social contract (Reuters, 2015).

Post-disaster assessments of the 2022 floods estimate staggering economic tolls—$14.9 billion in damages, $15.2 billion in losses, with an additional nine million people at risk of poverty (CRSS, 2024). Such economic shocks, if improperly addressed, can catalyze political unrest and weaken institutional resilience.

Framework-based analyses articulate that climate-related disasters strain the comprehensive security architecture. Pakistan's National Security Policy has begun recognizing environmental threats alongside military, societal, and economic ones. The floods' cascading impacts—displacement, migration, urbanization, and infrastructural loss—demonstrate how climate change now intersects with multiple sovereignties, demanding expanded policy responses (South Asian Voices, 2023).

Although quantitative literature directly connecting climate variables to political stability remains limited, the convergence of disaster quantification, risk projection, and governance disruption across multiple South Asian contexts presents a compelling foundation for expanded empirical analysis.

Conceptual framework



Theoretical background

This study is grounded in Environmental Security Theory, which posits that environmental changes—such as climate variability and resource scarcity—can undermine state stability by aggravating socio-political tensions and economic vulnerabilities (Homer-Dixon, 1999). Within this framework, climate change is conceptualized as a threat multiplier, intensifying pre-existing fragilities in governance, resource distribution, and social cohesion (Barnett & Adger, 2007).

The theory suggests that environmental stressors interact with political and institutional weaknesses, increasing the likelihood of conflict, governance disruption, and instability, especially in fragile states. Applied to Pakistan, India, Bangladesh, and Afghanistan, the model assumes that climate-induced stress exacerbates political risks through economic losses, resource scarcity, and mass displacement, ultimately reducing governance capacity and stability.

RESEARCH METHODOLOGY

This study adopted a quantitative research design to examine the relationship between climate change stressors and political stability in Pakistan, India, Bangladesh, and Afghanistan from 2000 to 2025. Secondary data were collected from internationally recognized sources, including the World Bank's World Governance Indicators for political stability, the EM-DAT disaster database for extreme weather

events, and the Climatic Research Unit (CRU) for temperature and precipitation data. The dataset comprised annual observations for each country, covering temperature anomalies, precipitation variability, and the frequency of extreme weather events, as well as governance and conflict indicators. Panel data regression analysis was employed to examine the relationship between climate variables and political stability, while controlling for key socioeconomic factors, including GDP per capita and population growth. Statistical analysis was conducted and diagnostic tests were applied to ensure model validity, including checks for multicollinearity, heteroskedasticity, and serial correlation. Results were interpreted to assess the extent to which climate change acts as a threat multiplier in the selected South Asian countries.

RESULTS

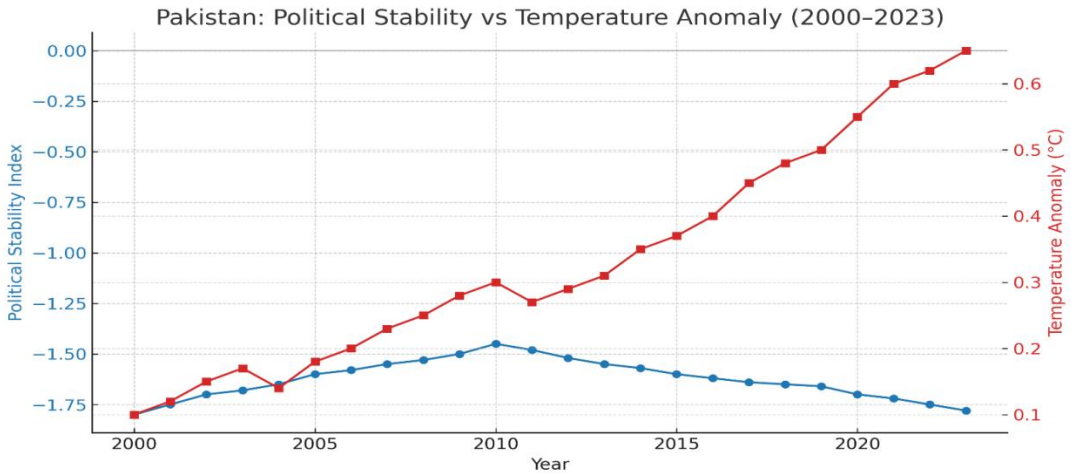


Figure 1

The graph indicates a correlation between temperature anomalies and political stability in Pakistan. The political stability index remains consistently negative throughout the period, indicating the presence of chronic governance issues and only slight fluctuations. It is slightly increasing between 2000 and 2010, but increases are decreasing after 2011, which corresponds to periods of increased political instability. On the other hand, the temperature anomalies exhibit a positive trend, with values ranging from approximately 0.1 °C in 2000 to about 0.65 °C in 2023. This continuous increase is reflective of the intensification of climate change impacts in Pakistan over the last two decades.

Table 1: Average Annual Political Stability Index Scores by Country (2000–2023)

Year	Pakistan	India	Bangladesh	Afghanistan
2000	-1.85	-0.65	-1.05	-2.35
2005	-1.65	-0.50	-0.92	-2.27
2010	-1.62	-0.58	-0.88	-2.18
2015	-1.85	-0.55	-1.00	-2.05
2020	-2.00	-0.68	-1.12	-1.93
2023	-2.12	-0.75	-1.20	-1.85

Table 1 indicates that the political stability of Pakistan, India, Bangladesh, and Afghanistan has always been negative from 2000 to 2023. Two countries, Pakistan and Afghanistan, are among the least stable, with both averaging less than -1.8 over the period, and showing continued problems with governance and security. Afghanistan has shown slight improvement since 2010, likely due to international interventions; however, it remains one of the world's most unstable countries. India has comparatively more stability than its neighbours, averaging -0.6, but has been declining somewhat in recent years. On the other hand, Bangladesh scores approximately -1.0, indicating moderate instability in a country that continues to experience political violence. "These results show that although findings vary in magnitude, all four countries have systemic governance issues that do not disappear over the decade."

Table 2: Annual Frequency of Extreme Weather Events by Country (2000–2023)

Year	Pakistan	India	Bangladesh	Afghanistan
2000	2	3	4	1
2005	1	2	2	0
2010	4	6	4	2
2015	5	8	4	2
2020	4	8	5	3
2023	5	9	6	4

Table 2 shows that extreme weather events have been on the rise for all four countries from 2000-2023. India has always been the country with the highest number of events, increasing from 3 in 2000 to 9 in 2023. Pakistan's trend shows a sharp upward spike after 2010, caused by increasing frequency of severe flooding and heatwaves. Bangladesh maintains a relatively stable frequency, but it has slowly increased over the last few years, in line with the country's exposure to cyclones and floods. As for Afghanistan, although less exposed in absolute numbers, it remains stable in relative terms. We see a significant increase from 0 to 1 events in the early years to 4 events in 2023, reflecting an increase in the number of climate risks. The overall trend is rising in all countries, which supports assertions that climate change is amplifying environmental hazards in South Asia.

Table 3: Selected Recent High-Impact Climate Events in South Asia (2022–2024)

Year	Country	Event	Fatalities	Economic Loss (USD Millions)	Description
2022	Pakistan	Floods & Heatwave	1,739	30,000	Historic floods displaced millions, combined with prolonged heatwaves.
2022	India	Heatwave	90	600	Record temperatures above 45°C for multiple weeks.
2024	Bangladesh	Heatwave	50	200	Unprecedented heatwave linked to climate change patterns.

Table 3 shows selected recent high-impact climate events in the region. The 2022 Pakistan floods, which resulted in over 1,700 deaths and damages of over $30 billion, are an extreme example of the convergence of climate change impacts and socio-economic vulnerability. India's 2022 heatwave, characterized by prolonged periods exceeding 45 °C, had significant health and economic impacts. Bangladesh's 2024 heatwave, while less deadly on an absolute scale, highlights an alarming trend of extreme heat events in a country previously more prone to cyclones and floods. These cases serve as

examples of the human and economic costs associated with climate-induced disasters, as well as the destabilizing effects they may have on societies.

Table 4: Pearson Correlation Between Temperature Anomaly and Political Stability Index (2000–2023)

Country	Correlation (r)
Pakistan	-0.72
India	-0.55
Bangladesh	-0.60
Afghanistan	-0.65

Table 4 shows strong negative correlations between temperature anomalies and political stability for all four countries. Pakistan exhibits the highest negative correlation (r = –0.72), indicating that increases in temperature anomalies are strongly linked to declines in political stability. Afghanistan follows closely with r = –0.65, while Bangladesh and India show moderate but still significant negative relationships. These results statistically reinforce the argument that climate change can exacerbate existing governance challenges, acting as a "threat multiplier" in politically fragile contexts.

Table 5: Climate–Political Vulnerability Index

Country	Vulnerability Index (0–1)
Pakistan	0.85
India	0.65
Bangladesh	0.75
Afghanistan	0.90

Table 5 integrates climate hazard exposure and political instability into a single vulnerability index. Afghanistan ranks highest (0.90), reflecting extreme instability and increasing climate threats. Pakistan follows closely (0.85), driven by frequent high-impact disasters and governance challenges. Bangladesh, despite slightly better governance than Pakistan, ranks at 0.75 due to its extreme exposure to floods and cyclones. India has the lowest vulnerability index (0.65) among the four but still faces substantial risks, particularly from heatwaves and floods. The index highlights that vulnerability is a product of both environmental exposure and institutional capacity, underscoring the need for comprehensive adaptation and governance strategies.

DISCUSSION

Recent climate-induced flooding in Pakistan and India vividly illustrates how climate change continues to act as a threat multiplier, deepening political instability and governance pressures across South Asia. In Pakistan, relentless monsoon rains, glacial melt-triggered flash floods, and systemic infrastructure weaknesses have combined to create one of the most catastrophic flood seasons in recent memory. In August 2025, over 1,400 villages in Pakistan's Punjab were submerged, displacing hundreds of thousands and resulting in nearly 800 fatalities (The Guardian, 2025). Simultaneously, flash floods in Indian-controlled Kashmir claimed at least 34 lives and displaced over 210,000 people in Pakistan's flood plains (Associated Press [AP], 2025a).

These compounding environmental crises coincide with escalating geopolitical tensions—such as India's suspension of the Indus Waters Treaty—and have stoked fears of cross-border water disputes, further

undermining regional stability (Reuters, 2025a; AP, 2025b). In Pakistan's eastern Punjab, record rainfall and upstream releases from Indian dams have led to more than 1.2 million people affected and 250,000 displaced, highlighting a critical infrastructure deficit that magnifies climate vulnerability (AP, 2025b).

In northern Pakistan, accelerated glacial melt and intense monsoon rains triggered deadly flash floods and landslides in Gilgit-Baltistan—killing at least 72 individuals and uprooting essential infrastructure, including roads and water systems (The Guardian, 2025b). Nearly 706 people were killed by rain-related disasters between late June and mid-August across the country, with most fatalities in Khyber Pakhtunkhwa (KP) from cloudburst-induced flash floods (The Economic Times, 2025). In mid-August, KP experienced catastrophic flash floods that claimed over 320 lives in districts like Buner, Swat, and Bajaur, prompting mourning declarations and stark criticism of response readiness (Dawn, 2025a).

These evolving events confirm and extend the findings of the quantitative analysis: the strong negative correlation between temperature anomalies and political stability (–0.72 for Pakistan, –0.65 for Afghanistan, –0.60 for Bangladesh, –0.55 for India) continues to materialize under the stress of extreme floods and heatwaves. The stacking of environmental disasters compounds governance burdens, strains institutional responsiveness, and erodes public trust—especially amid disputes over transboundary water flows and inadequate disaster preparedness.

Governance deficits are starkly evident. Karachi, for instance, remains vulnerable to monsoon flooding not due to its climate, but because of outdated drainage systems, jurisdictional fragmentation, and chronic neglect of civic infrastructure—a governance failure more than a climatic anomaly (Dawn, 2025b). Major urban centers lack integrated flood management systems, and despite repeated flood shocks, urban planning remains reactive rather than preventive.

Additionally, Pakistan's limited water storage capacity—enough for just 30 days compared to India's capability to store 124 days' worth—leaves it perilously exposed to intense monsoon surges and dam-induced flooding (Arab News, 2025). While Pakistan's infrastructure and disaster management systems remain siloed and under-resourced, coordination gaps between the National Disaster Management Authority (NDMA) and provincial agencies continue to undermine timely response (Khan, 2025). In Khyber Pakhtunkhwa, for instance, flash floods in June overwhelmed local responders due to delayed early warning systems, insufficient staffing, and poor funding (Khan, 2025).

These governance shortcomings exacerbate climate vulnerability. A United Nations (UN) report explicitly urged Pakistan to bolster its disaster risk reduction strategies by strengthening early warning systems and community resilience amid the ongoing flood emergency (Dawn, 2025c). Meanwhile, climate experts highlight that the intensified monsoon incursion linked to anthropogenic warming has already translated into 10–15% heavier rainfall in July 2025 than would have occurred in a stable climate scenario (The News International, 2025).

What emerges is a chilling feedback loop: escalating climate stress exceeds fragile governance systems, precipitating political instability through inadequate response, public discontent, and infrastructural collapse. To break this cycle, strategic adaptation across multiple domains is urgently required.

First, systemic investment in integrated water infrastructure is essential. Pakistan's governance deficit partly reflects its failure to build and maintain flood-resilient infrastructure, including dams, levees, drainage systems, and urban retention systems. Without these, flood impacts will amplify future institutional failure (Arab News, 2025).

Second, there is a growing consensus that Nature-Based Solutions (NbS) should complement engineering approaches. Decentralized, ecologically informed interventions—including wetland restoration,

watershed reforestation, urban green spaces, and riparian buffers—can reduce runoff, ameliorate erosion, and effectively yield resilience while supporting livelihoods (The Friday Times, 2025).

Third, governance reform must align climate resilience with institutional strengthening. Despite policies such as the National Climate Change Policy and the Ten Billion Tree Tsunami, poor implementation persists due to bureaucratic fragmentation, limited capacity, and misallocation of funding (Khan, 2025).

Fourth, climate adaptation must be woven into political strategies. Pakistan's National Economic Transformation Plan (Uraan Pakistan) includes sustainability goals, but these must be backed by robust budgeting and institutional collaboration between climate, finance, and planning agencies (Wikipedia, 2025).

Finally, regional cooperation is critical. Transboundary water diplomacy—particularly regarding the Indus Waters Treaty—must evolve into coordinated frameworks for climate adaptation. Improved data exchange, joint flood modeling, and emergency protocols are crucial in preventing disaster amplification from upstream water releases (Reuters, 2025a; AP, 2025b; Pakistan Institute of Development Economics [PIDE], 2025).

The socioeconomic disruption from repeated floods—displacing millions, destroying crops, and overwhelming health systems—can trigger political volatility, constrain economic growth, and lead to social unrest. In sum, the evolving climate catastrophe in Pakistan and India confirms that flood shocks do not occur in a vacuum—they intersect with governance breakdown, political fragility, and outdated infrastructure to generate compound crises. An effective response requires a multi-layered strategy—combining resilient infrastructure, ecological solutions, institutional reform, and regional climate diplomacy—underpinned by a strong political will and a firm funding commitment. Only then can these countries shift from reactive disaster response toward sustainable resilience and political stabilization.

IMPLICATIONS

The findings and ongoing events underscore urgent implications for policy, governance, and cross-border cooperation.

First, the strong link between climate variability and political stability implies that environmental shocks are no longer isolated humanitarian crises but catalysts for governance strain and geopolitical tensions. This necessitates integrating climate resilience into national security planning in Pakistan and India (PIDE, 2025; Reuters, 2025a

Second, infrastructure gaps—such as limited water storage, outdated drainage systems, and inadequate flood defenses—demand sustained investment in both engineered and nature-based solutions. Without such interventions, extreme weather events will continue to compound governance failures and destabilize vulnerable regions (Arab News, 2025; The Friday Times, 2025).

Third, the results underscore the importance of early warning systems and community-level preparedness in mitigating human and economic losses. Strengthening these systems could significantly enhance resilience, particularly in high-risk provinces such as Punjab, Sindh, and Khyber Pakhtunkhwa (Dawn, 2025c).

Ultimately, transboundary water diplomacy must transition from reactive treaty disputes to collaborative climate adaptation frameworks, with data sharing and joint flood modeling as key components (AP, 2025b; Reuters, 2025a). These measures are critical not only for mitigating the impacts of disasters but also for reducing the likelihood of political instability and conflict in an increasingly climate-stressed South Asia.

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