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Climate Change, Rural Societies, and Social Fragmentation in Pakistan: A Sociological and Policy Analysis of Vulnerability and Resilience in the Global South (2023-2026).

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ABSTRACT

Climate change in Pakistan is not merely an environmental crisis but a catalyst for profound social transformation in rural societies. This study critically analyzes how intensifying climate shocks (2023-2026) are accelerating social fragmentation through livelihood disruption, inequality, and weakening community cohesion. Integrating sociological theory with policy analysis, it explores the intersection of vulnerability, power structures, and adaptive capacity in the Global South. The research argues that existing policy frameworks inadequately address the social dimensions of climate change, thereby reinforcing marginalization. By foregrounding climate justice and resilience, the study offers a nuanced, policy-oriented framework for fostering inclusive and socially sustainable adaptation strategies.

Keywords: Climate Resilience, Social Fragmentation, Vulnerability Index, Policy Implementation Gap, Global South, Human Security.

Introduction

Climate change has evolved into a multidimensional crisis that extends beyond environmental degradation, reshaping socio-economic structures and governance systems across the Global South. In Pakistan, one of the most climate-vulnerable countries, increasing floods, droughts, and temperature extremes have exposed deep-rooted structural inequalities and institutional weaknesses. Importantly, climate change operates as a "threat multiplier," intensifying existing socio-economic disparities and exacerbating rural vulnerability (Intergovernmental Panel on Climate Change [IPCC], 2022; World Bank, 2023). Rural societies, heavily dependent on climate-sensitive livelihoods such as agriculture, are disproportionately affected.

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Environmental stress disrupts not only economic stability but also social cohesion, weakening kinship systems, communal trust, and traditional governance structures. These transformations contribute to growing social fragmentation, marked by resource competition, marginalization, and declining collective resilience (Adger, 2006; Eriksen et al., 2021). Despite extensive research on environmental and economic impacts, the social dimensions of climate change remain underexplored, particularly in Pakistan. Existing policy frameworks largely adopt technocratic approaches, neglecting how inequality, power relations, and institutional gaps shape vulnerability and adaptive capacity. This study addresses this gap by analyzing the intersection of climate change, rural societies, and social fragmentation, offering a sociologically grounded and policy-relevant framework for inclusive resilience (Füssel, 2007; Ribot, 2014).

Literature Review

The existing body of literature on climate change in Pakistan and the Global South has predominantly focused on environmental degradation, agricultural losses, and economic vulnerability. Studies highlight that recurrent floods, droughts, and erratic weather patterns significantly undermine rural livelihoods, particularly in agrarian economies dependent on natural resources (Intergovernmental Panel on Climate Change [IPCC], 2022; World Bank, 2023). However, this dominant perspective often underestimates the deeper **social implications** of climate change. Scholars increasingly conceptualize climate change as a **"threat multiplier"** that intensifies pre-existing inequalities related to class, gender, and access to resources. Vulnerability is not uniform; rather, it is socially constructed through unequal power relations and institutional disparities. Research in political ecology emphasizes how marginalized groups small farmers, landless laborers, and women face disproportionate exposure to climate risks due to limited adaptive capacity (Ribot, 2014; Eriksen et al., 2021).

Emerging literature also links climate stress to **social fragmentation**, including the erosion of social capital, weakening of communal bonds, and increased competition over scarce resources. Climate-induced migration further disrupts traditional social structures, contributing to identity crises, social exclusion, and conflict in both origin and destination areas (Black et al., 2011; McLeman & Gemenne, 2018). Policy-oriented studies, however, critique the limited integration of these social dimensions into climate governance. In Pakistan, adaptation policies remain largely technocratic and reactive, focusing on infrastructure while neglecting social cohesion and community resilience (Government of Pakistan, 2021; Füssel, 2007). This highlights a critical gap that necessitates a **sociologically informed and policy-integrated approach** to climate change analysis.

Problem Statement

Despite increased policy focus, climate change in Pakistan is still addressed through technocratic frameworks that neglect its sociological dimensions. In rural areas, environmental shocks disrupt livelihoods while reshaping power relations, intensifying inequality, and weakening social cohesion. These dynamics accelerate social fragmentation, including resource conflicts and exclusion. As vulnerability is

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structurally embedded in class, land ownership, and gender, its neglect in policy design limits effective adaptation and risks reinforcing marginalization, highlighting the need for socially informed climate governance.

Research Objectives

To critically examine how climate change restructures rural social relations in Pakistan by accelerating social fragmentation through inequality, resource competition, and weakened community cohesion (2023-2026).

To assess how structural inequalities (class, gender, and land ownership) shape differentiated vulnerability and resilience, and how these factors are inadequately addressed within existing climate policy frameworks in Pakistan.

Research Questions

How does climate change interact with existing socio-economic inequalities to restructure rural social relations and accelerate social fragmentation in Pakistan?

To what extent do current climate governance and policy frameworks in Pakistan fail to address the social dimensions of vulnerability, and how does this gap shape uneven resilience outcomes in rural communities?

Theoretical Framework

The study uses the Political Ecology of Climate Change framework to analyze how environmental change is shaped by power relations, inequality, and governance structures rather than natural factors alone. It explains how class, land ownership, and gender determine differential vulnerability in rural Pakistan. This framework also highlights how state policies often reinforce existing inequalities, resulting in uneven resilience and accelerating processes of social fragmentation in climate-affected rural communities.

Methodology

This study adopts a **mixed-methods research design**, integrating quantitative and qualitative approaches to ensure comprehensive analysis. The study is conducted in selected climate-vulnerable rural districts of **Khyber Pakhtunkhwa**. Data will be collected through **20-30 household surveys, 7-12 informant interviews**, focus group discussions, and policy document analysis of national and provincial climate frameworks. Stratified random sampling will be used for households, while purposive sampling will guide selection of key informants. Quantitative data will be analyzed using SPSS, and qualitative data through thematic analysis. The study focuses on developments from **2023-2026** to capture recent climate and policy dynamics.

Significance of the Study

This study is significant as it highlights the neglected social dimensions of climate change in rural Pakistan, particularly social fragmentation and inequality. It contributes to climate justice and sociological literature while offering policy-relevant insights for inclusive adaptation strategies, strengthening resilience, and improving governance in vulnerable Global South communities.

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Climate Change Dynamics in Pakistan (2023-2026)

Pakistan is experiencing a clear intensification of hydrometeorological extremes, particularly in the form of increasingly frequent and severe floods. This shift is closely linked to broader climatic warming, which enhances atmospheric moisture retention and disrupts monsoon variability. As a result, rainfall events are becoming more concentrated, producing high-intensity downpours over short periods rather than steady seasonal precipitation. In the Indus basin, this creates a compounded risk where glacial meltwater and extreme monsoon rainfall converge, significantly increasing river discharge beyond the absorptive capacity of natural and engineered systems. Recent analyses highlight that Pakistan's flood regime is no longer episodic but increasingly structural, driven by climate-induced variability combined with weak drainage infrastructure and limited disaster preparedness (Muzammil et al., 2023). Moreover, the recurrence of catastrophic flooding events underscores the country's transition into a high-risk climate hotspot, where environmental shocks are increasingly normalized rather than exceptional (Ali et al., 2025). This evolving pattern reflects not only climatic stress but also governance limitations in managing climate adaptation at scale.

Rising temperatures are exerting profound pressure on Pakistan's agricultural sector, which remains the backbone of rural livelihoods and national food security. Heat stress is increasingly affecting crop phenology, particularly during critical growth stages such as flowering and grain filling in wheat and rice. Elevated temperatures accelerate evapotranspiration, thereby increasing irrigation demand at a time when water availability is already under strain. This creates a structural imbalance between water supply and agricultural demand, reducing overall productivity. Empirical studies show that anthropogenic climate change has already contributed to measurable declines in global agricultural productivity, with South Asian systems being among the most vulnerable due to high baseline temperatures and dependency on irrigation (Ortiz-Bobea et al., 2020). In Pakistan, this translates into declining yields, rising input costs, and growing instability in rural incomes. Livestock systems are similarly affected, as heat stress reduces animal health, fertility, and productivity. Consequently, climate change is not merely an environmental stressor but a direct threat to agricultural sustainability and rural economic resilience.

Water security in Pakistan is increasingly shaped by accelerated glacial melt in the Hindu Kush–Himalayan region, which serves as the primary hydrological reservoir for the Indus River system. In the short term, increased melting contributes to higher river flows and flood risks; however, in the long term, the depletion of glacial mass threatens the stability of downstream water availability. This duality creates a "flood–scarcity paradox," where immediate water abundance masks a structurally declining resource base. Climate variability further exacerbates seasonal unpredictability, undermining irrigation planning and agricultural scheduling. Studies emphasize that climate change is fundamentally altering flood dynamics and hydrological cycles in Pakistan, making water flows more erratic and difficult to manage through traditional infrastructure (Ali et al., 2025). As surface water becomes less reliable, groundwater extraction has intensified, accelerating aquifer depletion and increasing long-term water insecurity. This dynamic indicates that Pakistan's water crisis is no longer solely a management issue but a manifestation of systemic climatic transformation

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across the Indus basin.

The cumulative impact of floods, heat stress, and water scarcity is driving significant socio-spatial transformation in Pakistan, particularly through rural displacement and migration. Agricultural failure and repeated climate shocks are undermining the viability of rural livelihoods, forcing households to adopt coping strategies that often include seasonal or permanent migration to urban centers. This rural-to-urban movement is reshaping demographic patterns and intensifying pressures on already strained urban infrastructure, particularly in cities such as Karachi, Lahore, and Peshawar. Large-scale flood events have further accelerated displacement, creating climate-induced internal migration flows that are increasingly protracted rather than temporary. Research highlights that Pakistan's climate crisis is not only environmental but also deeply socioeconomic, contributing to inequality, food insecurity, and governance challenges (The Agricultural Economist, 2025). Additionally, repeated climate disasters expose structural weaknesses in disaster response and recovery mechanisms, often resulting in long-term vulnerability rather than resilience building (The Grand Review, 2026). This demonstrates that climate change is functioning as a threat multiplier, reshaping rural society and intensifying patterns of forced mobility.

Rural Societies and Structural Vulnerability in Pakistan

Rural societies in Pakistan remain heavily dependent on agriculture, which makes them extremely sensitive to climate variability. Most rural households rely on rain-fed farming, seasonal crops, and livestock, meaning that even small changes in temperature or rainfall can directly affect their income and food security. When floods destroy crops or heatwaves reduce yields, these families often have no alternative source of livelihood. Over time, this deep dependence on climate-sensitive agriculture has turned rural communities into the first and most vulnerable victims of climate change. Studies show that climate shocks are no longer occasional disruptions but repeated stress factors that weaken rural economic stability and deepen food insecurity (Ortiz-Bobea et al., 2020). In simple terms, when the climate changes, rural life in Pakistan becomes unstable almost immediately.

One of the biggest reasons rural vulnerability persists is the lack of strong infrastructure and weak institutional support. Many villages still lack proper irrigation systems, flood protection structures, health facilities, and emergency response mechanisms. When disasters like floods or droughts occur, these areas are often the last to receive help and the first to suffer damage. Roads are frequently washed away, making rescue and recovery even more difficult. Institutional neglect over time has created a situation where rural communities are not only exposed to climate risks but are also poorly equipped to recover from them. Research highlights that weak governance and inadequate disaster preparedness significantly increase the human and economic costs of climate events in Pakistan (Ali et al., 2025). As a result, rural populations often feel abandoned during crises, which deepens their long-term vulnerability.

Poverty plays a central role in increasing climate vulnerability in rural Pakistan. Poor households have fewer savings, limited access to credit, and almost no safety nets to absorb climate shocks. When a flood destroys crops or livestock, wealthier farmers

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may recover through loans or assets, but poorer families often fall deeper into poverty. At the same time, resources such as water, land, and agricultural support are not distributed equally, which creates structural disadvantages for small farmers. This inequality means that climate impacts are not experienced equally those with fewer resources suffer more and recover more slowly. Studies on climate and agriculture consistently show that poverty amplifies the negative effects of climate change, especially in developing countries where rural economies are already fragile (FAO & WMO, 2026). In Pakistan, this creates a cycle where poverty increases vulnerability, and vulnerability deepens poverty.

Beyond poverty, deeper structural inequalities shape how rural communities experience climate change. Access to education, healthcare, land ownership, and political influence is uneven across rural society, which means that some groups are far more exposed to climate shocks than others. Large landowners often have better protection and resources, while small farmers, tenants, and landless laborers face the highest risks. Women and marginalized groups are particularly vulnerable because they often have limited access to decision-making and financial resources. Over time, climate change acts as a "threat multiplier," intensifying existing inequalities rather than affecting everyone equally. Research suggests that climate-related disasters in Pakistan are deeply linked to social and institutional inequalities, which determine who suffers most and who recovers first (The Agricultural Economist, 2025). This shows that climate vulnerability in rural Pakistan is not only environmental it is deeply social and structural.

Social Fragmentation under Climate Stress

Climate change in rural Pakistan is not only reshaping livelihoods but also quietly weakening the social fabric that holds communities together. Traditionally, rural life has been built on cooperation, shared labor, and strong interpersonal trust. However, increasing climate shocks especially floods, droughts, and crop failures are putting severe pressure on these relationships. In the past, rural communities in Pakistan relied heavily on collective support systems during difficult times, such as helping each other during harvests or rebuilding homes after disasters. Today, repeated climate disasters are stretching these systems beyond capacity. When everyone is struggling at the same time, the ability to help one another weakens. People become more focused on their own survival, and long-standing traditions of mutual assistance slowly erode. This gradual breakdown of solidarity is not sudden but a slow social shift caused by repeated stress and resource scarcity.

One of the most visible impacts of climate stress is migration. As farming becomes less reliable, many rural residents' especially young men move to cities in search of work. While this migration helps families survive economically, it also leads to emotional and social separation. Families are often split across rural and urban spaces, weakening traditional family structures. Children grow up without one or both parents present, and elderly people are left behind in climate-vulnerable villages. Over time, this separation reduces the strength of family-based support systems that once formed the backbone of rural resilience. Climate stress is also intensifying competition over essential resources like water and agricultural land. As water becomes scarce due to irregular rainfall and reduced river flows, disputes between farmers, villages, and

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even provinces are becoming more common. Similarly, fertile land is becoming more valuable, leading to conflicts over ownership and access. These tensions are not just economic they often turn social, creating divisions within and between communities. Research shows that environmental scarcity can directly increase social tensions and local conflicts in vulnerable regions (The Agricultural Economist, 2025).

Climate change does not affect everyone equally. Wealthier households often have better access to irrigation, technology, and financial resources, allowing them to recover more quickly from disasters. In contrast, poorer families struggle to rebuild their livelihoods. This unequal recovery process increases resentment and deepens social divides within communities. Over time, these inequalities can lead to mistrust and conflict, as people begin to perceive that survival depends more on wealth than on collective effort. Such dynamics weaken traditional rural harmony and create long-term social fragmentation. Perhaps the most serious long-term effect of climate stress is the gradual erosion of trust. When disasters repeatedly destroy homes, crops, and livelihoods, people begin to lose confidence in institutions, neighbors, and even collective systems. Cooperation becomes harder because uncertainty dominates daily life. This breakdown of trust weakens social cohesion and makes coordinated community responses to disasters less effective. In this sense, climate change is not only an environmental challenge but also a social one, reshaping how people relate to each other under stress.

Resilience, Adaptation, and Coping Mechanisms

Despite these challenges, rural communities in Pakistan are not passive victims of climate change. They actively develop coping strategies and resilience mechanisms to survive in increasingly difficult conditions (Adger, 2003; Scoones, 1998). At the household level, families are adopting a range of survival strategies. These include diversifying income sources, reducing agricultural dependency, and increasing reliance on remittances from migrant family members (Morton, 2007; World Bank, 2022). Many households also adjust crop choices, shifting toward more drought-resistant or short-season crops. While these strategies do not eliminate vulnerability, they help families manage short-term shocks and reduce immediate risks. In many cases, adaptation is not planned but reactive families adjust only after experiencing repeated losses (Barnett & O'Neill, 2010).

Communities also rely on collective resilience mechanisms to cope with climate stress. In many rural areas, informal sharing systems still exist, where families support each other through labor exchange, food sharing, or temporary shelter during disasters (Agrawal, 2008). These community-based systems play a crucial role in reducing the immediate impact of floods or crop failures. However, their effectiveness is weakening under increasing climate pressure, as repeated disasters reduce the resources available for mutual support. Informal institutions such as jirgas and kinship-based networks continue to play an important role in rural resilience. Jirgas help resolve local disputes over land and water, while kinship ties provide emotional and financial support during crises. These systems often act faster than formal state institutions in responding to local needs; however, their effectiveness varies depending on social structure and can sometimes reinforce existing inequalities if decision-making power is concentrated in certain groups (Leichenko & O'Brien, 2008). Climate adaptation is also deeply gendered. Women in rural Pakistan often

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carry the heaviest burden of climate stress, as they are responsible for managing households, water collection, and food preparation under increasingly difficult conditions (Kabeer, 2016). Despite these challenges, women play a central role in maintaining household resilience through informal labor, savings management, and social support networks. However, their contributions are often undervalued in formal policy discussions. Strengthening women's access to resources, education, and decision-making is therefore essential for building long-term climate resilience (IPCC, 2022).

Governance Gaps in Climate Response in Pakistan

Pakistan's climate governance framework reflects a persistent disconnect between policy formulation and on-ground implementation. Although the country has developed key policy instruments such as the National Climate Change Policy (2012, updated in 2021) and the Climate Change Act (2017), their execution remains weak due to fragmented institutional coordination, limited financial allocation, and overlapping federal-provincial responsibilities (Government of Pakistan, 2021; ADB, 2021). In practice, climate policy often remains aspirational rather than operational, particularly in rural and disaster-prone regions where adaptive capacity is lowest. This implementation gap is further intensified by bureaucratic inefficiencies and political discontinuity, which weaken long-term climate planning and reduce policy effectiveness (World Bank, 2022). Disaster management institutions in Pakistan, particularly the National Disaster Management Authority (NDMA) and Provincial Disaster Management Authorities (PDMAs), have made progress in emergency response but remain largely reactive rather than preventive in orientation (NDMA, 2023). The catastrophic floods of 2022 exposed critical weaknesses in early warning systems, risk mapping, and community preparedness (IPCC, 2022). Instead of integrated disaster risk reduction, the system still relies heavily on post-disaster relief, which perpetuates vulnerability cycles.

Non-governmental organizations (NGOs) and international aid agencies play a crucial compensatory role in Pakistan's climate landscape. Organizations such as the UNDP, World Bank, and various international humanitarian agencies provide funding, technical expertise, and capacity-building support for adaptation projects (UNDP, 2023; World Bank, 2022). However, their interventions are often project-based and time-bound, limiting long-term institutional strengthening. While NGOs help fill governance gaps, their parallel systems sometimes create fragmentation rather than integration within national frameworks, raising concerns about sustainability and dependency. A further governance challenge lies in the weak representation of rural populations in climate policymaking. Despite being the most affected by climate shocks especially in agriculture-dependent regions such as Sindh, South Punjab, and Khyber Pakhtunkhwa, rural communities remain underrepresented in decision-making processes (Mearns & Norton, 2010). Policy design is often urban-centric and technocratic, failing to incorporate indigenous knowledge and local adaptive practices. This exclusion deepens inequality and reduces the responsiveness of climate governance to grassroots realities.

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Comparative Perspective from the Global South

Pakistan's climate vulnerabilities closely mirror those experienced across the Global South, particularly in countries such as Bangladesh, India, and several Sub-Saharan African states (IPCC, 2022). These countries face similar challenges, including high exposure to extreme weather events, weak adaptive infrastructure, and constrained fiscal capacity. For instance, Bangladesh has developed relatively stronger community-based adaptation systems, yet still suffers from cyclone and flooding risks due to its geographic exposure (Jäger & Mitter, 2019). India, while more economically diversified, continues to struggle with uneven climate resilience across states, especially in rural agrarian belts. Sub-Saharan African countries face even deeper structural vulnerabilities due to poverty, governance instability, and limited technological capacity. A central theme connecting these regions is climate injustice, where nations least responsible for global greenhouse gas emissions bear the highest burden of climate impacts (Roberts & Parks, 2007). This structural inequality highlights the ethical and political dimensions of climate change, where adaptation costs are disproportionately shifted to developing countries. Pakistan, like its Global South counterparts, contributes minimally to global emissions yet experiences severe climate shocks such as glacial melt, floods, and heat waves (IPCC, 2022). This imbalance reinforces calls for climate justice frameworks that emphasize equity in global climate financing and mitigation responsibility.

The legacy of colonialism and historical underdevelopment also plays a significant role in shaping present-day climate vulnerability. Many Global South states inherited extractive economic structures, weak institutions, and externally dependent development models (Leichenko & O'Brien, 2008). These historical conditions have limited their ability to invest in resilient infrastructure, environmental governance, and sustainable urban planning. In Pakistan, colonial-era irrigation systems and uneven regional development continue to shape agrarian vulnerability and water insecurity, demonstrating how historical legacies intersect with modern climate risks. Despite geographical and cultural differences, Global South countries share a common vulnerability profile characterized by limited adaptive capacity, high exposure to climate hazards, and constrained governance systems. This shared condition underscores the need for collective South–South cooperation in climate diplomacy, technology transfer, and financial mobilization. It also highlights that climate change is not merely an environmental issue but a deeply structural development challenge rooted in global inequality (UNDP, 2023).

Conclusion

Climate change in Pakistan is no longer a distant environmental concern; it has become a structural condition shaping rural life, governance performance, and social resilience. The analysis demonstrates that while rural communities are highly exposed to climate risks, they are not passive recipients of vulnerability. Instead, they actively construct adaptive strategies at household and community levels, ranging from livelihood diversification and migration-based income support to informal systems of mutual aid and indigenous dispute resolution. However, these coping mechanisms are increasingly under strain due to the rising frequency and intensity of climate shocks, revealing the limits of localized resilience in the absence of strong institutional

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support.

At the governance level, Pakistan's climate response remains constrained by weak implementation capacity, fragmented institutional coordination, and a persistent urban bias in policymaking. Despite the presence of formal climate policies and disaster management frameworks, their limited translation into effective action highlights a critical governance deficit. This gap is further widened by the reliance on external actors such as NGOs and international organizations, which, while important, cannot substitute for sustainable domestic institutional strengthening. The exclusion of rural voices from decision-making processes further deepens structural inequality, reducing the effectiveness and legitimacy of climate governance. From a comparative Global South perspective, Pakistan's experience reflects broader patterns of climate injustice, historical underdevelopment, and institutional fragility. Countries with minimal contribution to global emissions continue to bear disproportionate climate burdens, underscoring the ethical urgency of climate justice and equitable adaptation financing. Ultimately, climate change in Pakistan must be understood not merely as an environmental crisis but as a multidimensional development challenge requiring integrated governance reform, social inclusion, and strengthened community-state synergy for long-term resilience.

Findings

The findings of this study indicate that climate change in Pakistan is not only an environmental phenomenon but a powerful driver of social restructuring. Increasing climate variability manifested through floods, droughts, heat stress, and water scarcity is reshaping rural livelihoods, migration patterns, and community organization. Traditional agrarian systems are being disrupted, forcing households to rethink income sources, mobility strategies, and survival mechanisms. As a result, climate change is gradually reconfiguring social relations and economic dependencies in rural areas. A key analytical insight is the deepening of vulnerability and social fragmentation. Recurrent climate shocks disproportionately affect already marginalized groups, intensifying inequality between and within communities. Social cohesion is weakening as resource scarcity increases competition over land, water, and livelihoods. Migration, while serving as an adaptive strategy, also contributes to family separation and the erosion of local support systems, further amplifying social disintegration. At the same time, resilience systems remain uneven and fragile. While informal networks, kinship structures, and community-based coping mechanisms provide immediate relief, their effectiveness is declining under sustained climate pressure. State institutions, though present, are largely reactive and insufficiently integrated with local adaptive capacities. This duality creates a fragmented resilience landscape where survival depends on uneven access to social, economic, and institutional resources, highlighting the urgent need for more inclusive and coordinated adaptation frameworks.

Recommendations

Consolidate fragmented federal and provincial agencies into a unified national resilience mechanism to eliminate policy paralysis and ensure rapid delivery.

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Decentralize climate governance to district-level institutions to integrate indigenous knowledge and local socio-economic realities into adaptation strategies.
Scale social protection programs with "climate-trigger" mechanisms to provide immediate financial relief to landless farmers and marginalized rural groups.
Prioritize nature-based solutions and green infrastructure, such as "Recharge Pakistan," to restore aquifers and manage floodplains sustainably.
Incentivize water-efficient irrigation and heat-resistant crop varieties to safeguard the livelihoods of the 42% of the workforce in the agrarian sector.
Deploy localized, hazard-specific early warning systems to minimize the loss of lives and livestock in high-risk zones like GLOF-prone northern regions.
Transition from traditional aid to green bonds and carbon credits to bridge the multibillion-dollar funding gap for national adaptation.
Leverage international forums to secure "Loss and Damage" funding, framing climate resilience as a non-negotiable matter of national survival and global equity.

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