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## *Climate Change and Human Security in Pakistan: Policy Breaches and Strategic Response Frameworks*

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**Abstract**

Climate change poses a critical threat to human security in Pakistan, a country highly vulnerable to environmental shocks due to its geographical, socio-economic, and institutional landscape. This paper explores the multifaceted impacts of climate change ranging from extreme weather events and water scarcity to food insecurity and forced migration and how these disrupt livelihoods, exacerbate existing vulnerabilities, and strain governance structures. Despite numerous policies and action plans at the national and provincial levels, significant gaps remain in implementation, coordination, and long-term strategic planning. Drawing on comparative case studies, policy analysis, and stakeholder input, the paper proposes a comprehensive strategic response framework tailored to Pakistan's unique challenges. This includes strengthening institutional resilience, integrating climate risk into national security planning, enhancing community-based adaptation mechanisms, and fostering regional cooperation. The findings underscore the urgent need for a holistic, inclusive, and adaptive governance approach to safeguard human security in the face of escalating climate threats.

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## Introduction

Climate change has emerged as one of the most pressing global challenges of the 21st century, with far-reaching implications beyond environmental degradation. For countries like Pakistan, the threat is not only ecological but deeply rooted in human security. Human security—encompassing food, water, health, and shelter faces continuous disruption due to rising temperatures, erratic weather patterns, glacial melt, and increased frequency of natural disasters. Pakistan's geographical vulnerability, coupled with its socio-economic fragility, places millions of lives at risk and demands immediate and coordinated action (Raazia, 2023).

In recent decades, Pakistan has witnessed a series of climate-induced crises that have significantly undermined public safety and national development. Catastrophic floods in 2010 and 2022 displaced millions, destroyed infrastructure, and caused massive economic losses. Simultaneously, droughts and glacial melting in the north threaten long-term water availability, especially in an agrarian economy heavily dependent on the Indus River system. These environmental disruptions are closely tied to rising poverty, displacement, and conflict over scarce resources signaling a direct threat to the fabric of human security in the country (Khan, 2016).

Notwithstanding the evident risks, Pakistan's climate policies and institutional responses remain fragmented and under-resourced. While frameworks such as the National Climate Change Policy exist, implementation gaps, weak inter-agency coordination, and limited integration with national security planning have reduced their effectiveness. Addressing climate change not just as an environmental concern but as a core security issue is essential. This paper examines the breaches in existing policy approaches and proposes strategic frameworks for strengthening Pakistan's climate resilience and protecting its people from the mounting threats to their security (Asif, 2019).

## Theoretically Framework

### Human Security Theory

Human Security Theory provides a comprehensive and people-centered approach to understanding security in the contemporary world. Unlike traditional theories that emphasize territorial integrity and military threats, Human Security shifts the focus toward the protection of individuals and communities from critical and pervasive threats to their well-being. Introduced by the United Nations Development Programme (UNDP) in its 1994 Human Development Report, the theory identifies seven key dimensions of human security: environmental, food, health, economic, personal, community, and political security (Barnett, 2007).

This framework is particularly relevant in the context of climate change, which has emerged as a non-traditional but severe threat to human security. In countries like Pakistan, where socio-economic vulnerability intersects with environmental fragility, climate-induced disasters such as floods, droughts, and heatwaves directly impact people's access to water, food, shelter, and healthcare. Human Security Theory enables a multidimensional analysis of how environmental degradation not only disrupts ecosystems but also endangers the physical safety, health, and livelihoods of individuals, particularly marginalized communities. Smearing the Human Security Theory to Pakistan's climate challenges reveals the urgent need to conceptualize climate policy beyond mere environmental management. It underscores the necessity of integrated strategies that protect individuals from climate-related risks by enhancing resilience, ensuring equitable

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resource access, and strengthening disaster preparedness. This approach allows for a more holistic understanding of the climate-security nexus and informs the development of policy frameworks that prioritize people's safety and dignity in the face of environmental change (Riaz, 2019).

**Human Security Issue in Pakistan**

Pakistan is considered one of the country's most vulnerable to the adverse impacts of climate change, despite contributing minimally to global greenhouse gas emissions. The country has faced an increase in the frequency and severity of extreme weather events such as floods, droughts, and heatwaves. Notably, the 2022 floods submerged a third of the country, displaced millions, and caused significant economic losses, revealing the growing intensity of climate-induced disasters . Also, Pakistan's geographical location in a semi-arid region exacerbates its exposure to changing rainfall patterns and rising temperatures, which affect both rural and urban populations (Rehman, 2025)

One of the most critical challenges is the accelerated glacial melt in the Himalayas, which threatens long-term water security for Pakistan's agriculture-based economy. The Indus River system, fed primarily by glacier and snowmelt, is at risk due to rising temperatures that could initially increase river flows but eventually lead to water shortages . This situation directly impacts crop yields and food security, particularly in regions dependent on consistent irrigation. Research has shown that changes in temperature and precipitation patterns are already reducing agricultural productivity across multiple districts in Pakistan (Khan & Salman, 2020).

Climate change also has significant social and human impacts, including internal displacement, increased poverty, and urban vulnerability. Large-scale migration from flood-affected and drought-prone areas has contributed to the growth of informal settlements in major cities, straining infrastructure and public services (International Organization for Migration [IOM], 2022). Furthermore, heatwaves in urban areas like Karachi have led to numerous fatalities in recent years, particularly among low-income populations without access to cooling systems or reliable electricity. These compounded risks highlight the need for comprehensive, people-centered climate resilience strategies (Anwar, 2023).

**Policy Breaches and Gaps**

Despite the growing threat of climate change, Pakistan's policy response has been marked by significant gaps in implementation, enforcement, and coordination. While the country introduced the National Climate Change Policy (NCCP) in 2012 and an updated framework in 2021, these policies have largely remained aspirational due to weak institutional capacity and lack of political prioritization (Government of Pakistan, 2021). Environmental legislation, such as the Pakistan Environmental Protection Act (1997), is often poorly enforced, and provincial-level implementation remains inconsistent, particularly after the devolution of environmental governance under the 18th Amendment (UNDP, 2022). The policy formulation and on-ground action limits the country's ability to respond effectively to climate-induced threats.

The critical issue lies in the fragmentation of institutional responsibilities. Multiple bodies, including the Ministry of Climate Change, the National Disaster Management Authority (NDMA), and provincial environmental departments, often operate with overlapping mandates and poor coordination. As a result, climate resilience is frequently treated as a secondary concern rather than being mainstreamed into national development

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and security planning (Riaz, 2019). Furthermore, early warning systems, disaster preparedness, and community-level adaptation strategies are underfunded and underdeveloped, particularly in rural and flood-prone regions. The lack of a unified, cross-sectoral response exacerbates vulnerability during extreme climate events.

A persistent gap in Pakistan's climate governance is the absence of data-driven decision-making and local participation. There is limited investment in scientific research, climate modeling, and localized risk assessments, which impedes accurate forecasting and evidence-based policy development (ADB, 2021). Moreover, local communities—especially in rural and marginalized areas are rarely involved in the design or execution of climate action plans, undermining their relevance and sustainability. Without building institutional capacity, integrating climate policy with broader human development goals, and ensuring community engagement, Pakistan's climate policy is unlikely to deliver long-term security or resilience (Ali, 2022).

**Strategic Response Frameworks**

To effectively address the intersecting challenges of climate change and human security, Pakistan must adopt a strategic, multispectral response framework that integrates climate adaptation with national development and disaster risk reduction. One such model is the Climate-Resilient Development (CRD) approach, which emphasizes the integration of climate considerations into all levels of planning and policy, from infrastructure and health to agriculture and urban development (World Bank, 2021). By embedding resilience-building into governance systems and community programs, this framework not only reduces long-term vulnerabilities but also enhances adaptive capacities across sectors (Ahmad, 2022).

Strengthening institutional coordination and capacity is a critical element of this framework. Effective implementation demands a whole-of-government approach, where federal, provincial, and local institutions work collaboratively to mainstream climate resilience. For example, linking the National Climate Change Policy with Pakistan's Vision 2025 and provincial disaster management strategies can create a more coherent and responsive system (Government of Pakistan, 2021). Capacity-building initiatives, particularly within the National Disaster Management Authority (NDMA) and local government units, are essential for early warning systems, rapid disaster response, and community-based risk reduction (UNDP, 2022).

In addition to institutional reform, Pakistan should focus on inclusive and participatory governance, particularly through community engagement, public-private partnerships, and integration of indigenous knowledge. Frameworks such as Nature-Based Solutions (NbS) and Ecosystem-Based Adaptation (EbA) offer sustainable methods to mitigate climate impacts, especially in rural and flood-prone areas (IUCN, 2021). Promoting green infrastructure, sustainable agriculture, and local water management projects not only reduces ecological stress but also enhances economic resilience. Ultimately, strategic frameworks must move beyond reactive policies and embrace proactive, equity-centered planning to ensure climate justice and human security for all citizens.

**Conclusion**

Pakistan, situated in a region highly susceptible to climate change, has been experiencing a significant increase in the frequency and intensity of climate-induced disasters. These include flooding, droughts, heatwaves, and shifting monsoon patterns, all of which have

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direct consequences for human security. According to the Global Climate Risk Index, Pakistan ranks as one of the most vulnerable countries to climate change, with adverse impacts on its economy, agriculture, and water resource. The 2010 and 2022 floods, for example, wreaked havoc across the country, displacing millions of people and leaving a lasting impact on agriculture and infrastructure. The Glacial melting in the north and erratic rainfall patterns are expected to exacerbate water scarcity, threatening food security and livelihoods in the long term.

The Human Security Framework proves useful in understanding the various dimensions of vulnerability that Pakistan faces. The framework identifies environmental, food, water, health, economic, and personal security as the critical pillars of human well-being that are increasingly undermined by climate change. In Pakistan, the impacts on food and water security are perhaps the direst. The country's agriculture-dependent economy, where 60% of the population derives their livelihood from agriculture, is at extreme risk due to unpredictable weather patterns, erratic rainfall, and fluctuating temperatures. The agricultural sector contributes around 25% of the GDP, and yet, it is one of the most vulnerable to climate change-induced disruptions.

Despite the clear risks, Pakistan's climate policy landscape remains fragmented and underfunded. The National Climate Change Policy (NCCP), formulated in 2012, has been revised, yet its implementation remains sporadic, with poor coordination between national and provincial agencies. The Ministry of Climate Change and its sub-bodies are often overstretched, and the provincial disaster management authorities are frequently under-resourced (Riaz, 2019). The Pakistan Environmental Protection Agency (PEPA), while initially designed to oversee the country's environmental policies, lacks the authority and funding to ensure compliance. Local governance structures are equally ill-prepared to handle climate-related disasters due to a lack of capacity building and technical expertise.

Climate change presents an urgent and multidimensional threat to human security in Pakistan, affecting everything from food and water availability to public health, livelihoods, and internal displacement. Despite the presence of national climate policies, critical gaps in implementation, institutional coordination, and community engagement continue to undermine the country's ability to respond effectively. Utilizing the Human Security framework reveals the depth and interconnectedness of these vulnerabilities and highlights the need for people-centered, resilience-focused strategies. Moving forward, Pakistan must adopt inclusive, integrated, and proactive policy frameworks that align climate adaptation with sustainable development, strengthen institutional capacity, and empower local communities. Only through such a comprehensive approach can Pakistan safeguard the well-being of its citizens and build a more secure and climate-resilient future.

The implementing these strategic recommendations, Pakistan can enhance its resilience to climate change, safeguard human security, and promote sustainable development. Strengthening governance, mainstreaming climate adaptation into development plans, empowering local communities, investing in research and early warning systems, and mobilizing climate finance are critical actions that will provide a comprehensive response to the pressing challenges posed by climate change.

The intricate relationship between climate change and human security in Pakistan, a country increasingly vulnerable to environmental hazards such as floods, heatwaves, droughts, and glacial melt. Despite growing awareness, significant policy breaches and

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institutional shortcomings have hindered effective mitigation and adaptation. The paper critically examines gaps in national climate policies and their implementation, assessing how these lapses endanger human security particularly in terms of food, water, health, and livelihood. Additionally, it evaluates existing strategic frameworks and proposes an integrated, resilience-focused response to enhance climate governance, institutional accountability, and community-based adaptation efforts in Pakistan.

**Policy Recommendations**

The issue of climate change and its impact on human security, Pakistan needs to take comprehensive and integrated actions at both the policy and institutional levels. The following policy recommendations are designed to enhance Pakistan's climate resilience, improve human security, and foster sustainable development.

**Strengthening Institutional Coordination and Governance**

The government should establish a Climate Change Coordination Committee (4C) at the federal level to align and harmonize the actions of various agencies, including the National Disaster Management Authority (NDMA), the Ministry of Climate Change, and the Pakistan Environmental Protection Agency (PEPA). This committee should be empowered with decision-making authority to ensure that climate adaptation and mitigation measures are seamlessly integrated across all levels of government. Additionally, the role of provincial governments should be enhanced through the establishment of provincial climate change units that link local needs with national policies. The strengthening governance and institutional capacity, Pakistan can create a more unified approach to addressing climate risks, ensuring that policies and resources are directed efficiently to the most vulnerable regions.

**Mainstreaming Climate Change into National Development Plans**

To tackle climate change effectively, it is essential to mainstream climate considerations into national development plans. Policy Recommendation: The Pakistani government should incorporate climate change adaptation strategies into the five-year development plans and Vision 2025, making climate resilience a central pillar of national development. This includes ensuring that infrastructure projects, especially in urban planning and rural development, integrate climate risk assessments and adopt climate-resilient building techniques. Pakistan should prioritize green infrastructure solutions such as sustainable water management, flood control, and renewable energy systems part of its development goals.

**Enhancing Local Climate Adaptation and Community-Based Solutions**

Pakistan should prioritize community-based adaptation by involving local populations in the planning and execution of climate resilience projects. This can be achieved through **participatory** climate risk assessments and the creation of local climate action plans tailored to the unique needs of specific regions. These plans should focus on building the capacity of local governments, as well as providing financial support for community-led adaptation measures, such as flood protection infrastructure, improved irrigation systems, and soil conservation practices. Integrating indigenous knowledge about climate adaptation and disaster preparedness into national and local plans is crucial. Indigenous communities in Pakistan have often demonstrated resilience to environmental stresses, and their traditional knowledge can be leveraged to design more sustainable and culturally appropriate solutions.

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**Investing in Climate Data, Research, and Early Warning Systems**

The government should significantly increase its investment in climate research, meteorological services, and early warning systems. This can include strengthening the Pakistan Meteorological Department (PMD) and integrating it with regional climate monitoring networks to provide real-time data and early warnings for extreme weather events, such as floods, cyclones, and heatwaves. Early warning systems need to be localized and tailored to vulnerable communities so that timely evacuation and disaster relief can be mobilized. Climate modeling and risk assessments should become a routine part of government planning. These models can help predict future climate impacts and allow for the development of long-term climate adaptation strategies that are based on reliable data. Research efforts should focus on understanding the impacts of glacial melt, changing rainfall patterns, and temperature rise, particularly in the northern and coastal regions of Pakistan.

**Mobilizing Climate Finance for Adaptation and Mitigation**

Pakistan should work towards increasing its access to climate finance from international mechanisms, such as the Green Climate Fund (GCF) and Adaptation Fund, which are designed to help developing countries fund climate resilience projects. In parallel, Pakistan can establish climate bonds and seek public-private partnerships (PPPs) to fund sustainable infrastructure projects and community-based adaptation initiatives. Domestic financing mechanisms, such as a climate tax, can also be explored, where funds generated through taxes or levies on high-carbon industries are reinvested into climate adaptation and mitigation programs.Additionally, it is essential that climate finance be equitably distributed, with a focus on marginalized regions that are most vulnerable to climate change, such as coastal areas and rural communities in drought-prone regions.

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