Dialogue Social Science Review (DSSR)
www.thedssr.com

ISSN Online: 3007-3154
ISSN Print: 3007-3146

DIALOGUE SOCIAL SCIENCE REVIEW

Vol. 3 No. 8 (July) (2025)

Climate Change and Rural Crisis in Pakistan: Impacts, Vulnerabilities, and Adaptation Needs

Sada Hussain Soomro
M.Phil. Scholar, Department of Sociology, Lahore Leads University
sadahussain635@gmail.com

Alam Sher
M.Phil. Scholar, Department of Sociology, Lahore Leads University
alam.sher92@gmail.com

Abstract
This article examines the multifaceted impact of climate change on Pakistan's rural population. It focuses on agricultural vulnerability, water scarcity, public health risks, displacement and migration, gender inequality, infrastructure degradation, and economic insecurity. Drawing from current literature and data from national and international sources, the study highlights gaps in adaptation and policy implementation that hinder climate resilience. The findings underscore the urgent need for inclusive and evidence-based climate adaptation strategies tailored to the unique challenges faced by rural communities in Pakistan. The role of media in shaping the climate change discourse is also discussed, particularly in the context of global warming and Pakistan's vulnerability, despite its relatively low carbon emissions.

Keywords: Climate Change, Rural Pakistan, Adaptation, Agriculture, Gender, Migration, Water Scarcity, Public Health, Infrastructure, Resilience

Introduction

Pakistan ranks among the top 10 countries most vulnerable to climate change, despite contributing less than 1% to global greenhouse gas emissions (Global Climate Risk Index 2021). Over 63% of Pakistan's population resides in rural areas, with livelihoods heavily dependent on climate-sensitive sectors such as agriculture and livestock (Pakistan Bureau of Statistics, 2023). These communities bear the brunt of climate impacts due to socio-economic vulnerabilities, weak infrastructure, and limited institutional support.
This paper critically assesses current and projected climate impacts on rural populations and outlines strategic pathways for effective policy interventions and adaptation.

Agricultural Vulnerability:

Rural economies in Pakistan are highly dependent on agriculture, which employs about 38.5% of the labor force (Government of Pakistan). Rising temperatures, shifting rainfall patterns, and extreme weather events have caused significant reductions in crop yields, particularly wheat, rice, and cotton (FAO, 2022). Soil fertility is declining due to erratic irrigation practices and increasing salinization, especially in Sindh and South Punjab.

Dialogue Social Science Review (DSSR)
www.thedssr.com

ISSN Online: 3007-3154
ISSN Print: 3007-3146

DIALOGUE SOCIAL SCIENCE REVIEW

Vol. 3 No. 8 (July) (2025)

Water Scarcity:
Pakistan is approaching absolute water scarcity, with per capita water availability falling below 1,000 cubic meters (WRI, 2023). Climate-induced glacial melt in the Hindu Kush-Himalayan region threatens river systems in rural areas. Simultaneously, groundwater depletion is accelerating due to over-extraction and lack of recharge, particularly in rain-fed regions (Qureshi, 2022).

Public Health Risks:
Rural populations are increasingly exposed to vector-borne diseases such as malaria, dengue, and cholera, especially during and after floods (WHO, 2023). Heatwaves in southern Pakistan have led to rising morbidity and mortality, particularly among vulnerable groups such as children, the elderly, and pregnant women (Ali et al., 2022).

Displacement and Migration:
The 2022 floods displaced over 8 million people, with the worst impact in rural Sindh and Balochistan (UNOCHA, 2022). Climate-induced displacement disrupts livelihoods and pushes families toward urban peripheries, where they face new socio-economic challenges. This also results in the loss of indigenous knowledge and traditional farming practices, weakening future resilience.

Gendered Impacts:
Rural women in Pakistan disproportionately bear the burden of climate stress. They are primarily responsible for water collection, food preparation, and caregiving—roles that become more difficult under climate pressures (Naz, 2021). Gender inequality in access to education, decision-making, and resources further limits women's ability to adapt (IUCN Pakistan, 2020).

Infrastructure Damage:
Pakistan's rural infrastructure is not climate-resilient. Floods and landslides frequently destroy homes, irrigation systems, canals, roads, and schools (ADB, 2022). The 2022 disaster caused an estimated $14.9 billion in damages, much of it concentrated in rural areas (Ministry of Climate Change, 2023).

Economic Insecurity:
Recurring climate shocks have led to widespread livelihood losses, pushing many rural households into debt. Smallholder farmers often lack access to affordable credit, crop insurance, and post-disaster recovery mechanisms (Khan & Khushnood, 2021). Recovery is slow and uneven, reflecting deep institutional gaps and inadequate safety nets.

Policy and Adaptation Gaps:
Despite the existence of national climate policies (e.g., National Climate Change Policy 2021), implementation in rural areas remains weak. Challenges include limited local awareness, poor early warning systems, and a lack of targeted subsidies for climate-resilient inputs (Akhtar, 2023). There is a pressing need to integrate local knowledge with scientific approaches in policy design and execution.

Dialogue Social Science Review (DSSR)
www.thedssr.com

ISSN Online: 3007-3154
ISSN Print: 3007-3146

DIALOGUE SOCIAL SCIENCE REVIEW

Vol. 3 No. 8 (July) (2025)

Theoretical Frame Work

Theoretical Framework: Climate Change and Rural Vulnerability in Pakistan

1. Vulnerability Theory

As articulated by Adger (2006), vulnerability theory emphasizes the differential susceptibility of populations to climate-related hazards, shaped by socio-economic, geographical, and institutional factors. Cutter et al. (2003) further argue that vulnerability is not only determined by exposure to hazards but also by social conditions and access to resources. In rural Pakistan, communities experience high exposure to floods, droughts, and heatwaves, exacerbated by limited adaptive capacity, widespread poverty, and weak institutional support systems. This framework explains why specific groups—such as smallholder farmers, women, and landless laborers—are disproportionately affected by climate shocks.

Political Ecology

Political ecology provides a critical lens to analyze the intersection between environmental change and social power structures. It challenges technocratic and depoliticized responses to climate change by revealing how historical inequalities and institutional arrangements reproduce environmental vulnerabilities (Robbins 2004; Watts & Bohle 1993). In Pakistan, centralized water governance, inequitable land distribution, and chronic underinvestment in rural infrastructure have deepened the vulnerability of marginalized populations, particularly in regions prone to climate extremes.

Sustainable Livelihood Framework (SLF)

Developed by Scoones (1998) and operationalized by DFID (1999), the SLF examines how individuals and households utilize five forms of capital—natural, human, financial, physical, and social—to sustain their livelihoods. Climate change in rural Pakistan is eroding these capitals through crop failure, loss of livestock, land degradation, and displacement. The SLF identifies key entry points for adaptation, such as diversifying income sources, strengthening social safety nets, and improving access to climate-resilient infrastructure.

Climate Justice and Environmental Inequality

The climate justice perspective emphasizes the ethical and political dimensions of climate change, focusing on the disproportionate burden borne by communities who contribute least to global carbon emissions (Schlosberg 2007; Sultana 2022). In rural Pakistan, low-emitting communities face some of the harshest climate-related disruptions. This framework calls for equity-driven adaptation strategies that prioritize the voices and rights of the vulnerable, ensuring their participation in policy-making and fair resource distribution.

Adaptation Needs and Response Strategies Challenges

Pakistan is facing compounding climate crises, including:

- Intensifying heatwaves and glacial melts leading to recurrent disasters.
- Worsening water scarcity and agricultural decline affecting food security.
- Weak disaster surveillance and under-equipped healthcare systems.

Dialogue Social Science Review (DSSR)
www.thedssr.com

ISSN Online: 3007-3154
ISSN Print: 3007-3146

DIALOGUE SOCIAL SCIENCE REVIEW

Vol. 3 No. 8 (July) (2025)

- Insufficient international climate finance and heavy debt burden.

The Ministry of Climate Change has recommended adaptive strategies such as climate-resilient infrastructure, early warning systems, green spaces, and integrated public health units. However, local implementation remains weak due to institutional fragmentation and inadequate capacity.

Crises in Pakistan

- Pakistan is a climate crisis hotspot, disproportionately affected by Global warming despite minimal carbon emissions.
- Heat waves and floods are intensifying with record temperatures and glacial melt events triggering disasters annually.
- Water scarcity and agricultural decline threaten food security and rural livelihoods.
- Health systems and disaster surveillance remain under-equipped, making particularly vulnerable.
- Resilience depends on international support, debt relief and internal policy reforms to adaption needs to protect lives.

Role of Media in Climate Discourse and Resilience Building

Transmission of Climate Information

Media platforms—ranging from newspapers to social media—translate complex climate science into accessible language. In Pakistan, especially in rural areas with limited formal education, media serves as a critical channel for informing the public about climate risks and policy updates (Boykoff & Roberts 2007; Shanahan 2009). Effective framing of climate issues—such as floods or agricultural loss—can help communities connect with the problem more directly (Nisbet 2009).

Shaping Perception, Policy, and Action

Media not only informs but also shapes public perceptions and policy agendas. By using imagery and narratives, it can either induce fear and apathy or promote empowerment and collective action (O'Neill & Nicholson-Cole 2009). In Pakistan, media has played a role in spotlighting climate-induced disasters, yet gaps remain in consistent coverage, scientific literacy, and representation of rural and indigenous voices (Ali & Khan 2020).

Recommendations

To strengthen rural climate resilience, the following actions are suggested:

- Promote climate-smart agriculture and resilient farming techniques.
- Invest in rural infrastructure—particularly housing, irrigation, and transport.
- Expand access to financial tools such as microcredit and crop insurance.
- Mainstream gender equity in climate leadership and planning.
- Strengthen multi-tiered institutional coordination (federal, provincial, and district).

Dialogue Social Science Review (DSSR)
www.thedssr.com

ISSN Online: 3007-3154
ISSN Print: 3007-3146

DIALOGUE SOCIAL SCIENCE REVIEW

Vol. 3 No. 8 (July) (2025)

Conclusion

Rural communities in Pakistan are on the frontlines of the global climate crisis. Their vulnerability stems from a confluence of environmental, socio-economic, and institutional factors. Addressing this climate emergency requires urgent, inclusive, and evidence-based interventions. A climate-resilient future must prioritize equity, local knowledge, and institutional accountability. Future research should explore community-led adaptation models, indigenous resilience practices, and the long-term impacts of climate-induced displacement on rural demographics.

In rural Pakistan, climate change depletes these capitals, affecting forming systems labor, and income strategies.

References:

ADB. (2022). Building climate resilience in Pakistan's rural infrastructure. Asian Development Bank. https://www.adb.org

Akhtar, S. (2023). Climate governance and local adaptation in Pakistan: Challenges and opportunities. Pakistan Journal of Environmental Policy, 15(1), 33–49.

Ali, M., Ullah, A., & Rehman, S. (2022). Climate-sensitive diseases and rural health in Pakistan: A review. Journal of Health and Climate, 10(2), 55–70.

FAO. (2022). Climate-smart agriculture in Pakistan: Practices and opportunities. Food and Agriculture Organization of the United Nations. https://www.fao.org

Government of Pakistan. (2022). Pakistan National Adaptation Plan. Ministry of Climate Change, Islamabad.

Khan, R., & Khushnood, A. (2021). Building climate-resilient social protection in Pakistan. Development Policy Review, 39(4), 412–430. https://doi.org/10.1111/dpr.12529

Ministry of Climate Change. (2023). Pakistan Climate Risk and Adaptation Framework. Government of Pakistan.

Naz, A. (2021). Gendered vulnerabilities in climate change: Women's role in adaptation in rural Pakistan. Asian Journal of Women's Studies, 27(1), 64–84.

Qureshi, A. S. (2020). Water resources management under climate change in Pakistan. International Journal of Water Resources Development, 36(2), 165–180. https://doi.org/10.1080/07900627.2020.1720335

WHO. (2023). Health and climate change country profile: Pakistan. World Health Organization. https://www.who.int

WRI. (2023). Pakistan water stress and climate adaptation. World Resources Institute. https://www.wri.org

Adger, W. N. (2006). Vulnerability. Global Environmental Change, 16(3), 268–281. https://doi.org/10.1016/j.gloenvcha.2006.02.006

Cutter, S. L., Boruff, B. J., & Shirley, W. L. (2003). Social vulnerability to environmental hazards. Social Science Quarterly, 84(2), 242–261. https://doi.org/10.1111/1540-6237.8402002

DFID. (1999). Sustainable livelihoods guidance sheets. Department for International Development (UK).

[No URL provided—include one if publicly available.]

Robbins, P. (2004). Political ecology: A critical introduction. Wiley-Blackwell.

ISSN Online: 3007-3154
ISSN Print: 3007-3146

Vol. 3 No. 8 (July) (2025)

Schlosberg, D. (2007). Defining environmental justice: Theories, movements, and nature. Oxford University Press.

Scoones, I. (1998). Sustainable rural livelihoods: A framework for analysis (IDS Working Paper 72). Institute of Development Studies.

[Optional: Add URL if available, e.g., from IDS website.]

Sultana, F. (2022). The unbearable heaviness of climate coloniality. Political Geography, 102, 102684. https://doi.org/10.1016/j.polgeo.2022.102684

Watts, M. J., & Bohle, H. G. (1993). The space of vulnerability: The causal structure of hunger and famine. Progress in Human Geography, 17(1), 43–67. https://doi.org/10.1177/030913259301700103 Media and Climate Change References (APA 7th Edition Format)

Ali, N., & Khan, M. A. (2020). Media, climate change and public perception in Pakistan. Journal of Environmental Studies, 45(3), 201–217.

Boykoff, M. T., & Roberts, J. T. (2007). Media coverage of climate change: Current trends, strengths, weaknesses. UNDP Human Development Report.

Nisbet, M. C. (2009). Communicating climate change: Why frames matter for public engagement. Environment: Science and Policy for Sustainable Development, 51(2), 12–23.

O'Neill, S., & Nicholson-Cole, S. (2009). "Fear won't do it": Promoting positive engagement with climate change through visual and iconic representations. Science Communication, 30(3), 355–379.

Shanahan, M. (2009). Time to adapt? Media coverage of climate change in non-industrialized countries. In N. Adger, I. Lorenzoni, & K. O'Brien (Eds.), Adapting to climate change (pp. 145–158). Cambridge University Press.