Compound Climate Displacement in Pakistan

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Abstract

Climate change is a problem for Pakistan, when ecological disruptions combine with institutional fragility, they can result in a devastating scale of climate induced migration. Yet, existing theories of migration, and mainstream push-pull theories in particular, are poorly equipped to address the entwined and sophisticated drives to mobility within such an environment. This paper provides an analytical framework that integrates multi-causal approaches to displacement with attention to the mediating role of institutional vulnerability in the effects of climate change. This analysis focuses on northern Pakistan, where community displacements have been recurrent due to glacial retreat and outburst flooding of glacial lakes, and southern Pakistan, particularly Keti Bunder, where the sea-level rise, increased salinization, and cyclones gradually erode livelihoods. This article contributes to broader discussions around climate mobility in the Global South and the urgent need for anticipatory relocation planning and governance reform.

Keywords: Climate displacement, environmental fragility, GLOFs, Global South, migration, governance, mobility, Pakistan, resilience and adaptation.

Introduction

Climate migration is increasingly becoming one of the greatest challenges of the 21st century, especially for states where ecological risk overlaps with poor governance. Pakistan is one such country. With more than 240 million people and a heavy dependence on climate-sensitive water resources and agriculture, the nation is at the forefront of climate-induced displacement.[1] There are two hotspots of environmental concern that are particularly urgent: the highlands of the north, where the rate of glacial melting and glacial lake outburst floods (GLOFs) regularly destroy villages, and the south coast areas, especially the Indus Delta, where sea level rise, salinization, and cyclones wear away livelihoods and inevitably cause displacement.

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[1] United Nations Population Fund, *Pakistan's Population 2025* (New York: United Nations Population Fund, 2025), https://www.unfpa.org/data/world-population/PK.

Pakistan's recent history illustrates the devastating scale of climate disasters and their impacts on displacement. The 2010 floods in the Indus Basin displaced more than six million and submerged one-fifth of the country's landmass[2] while the 2022 monsoon floods affected one third of Pakistan, displacing 8 million and causing an estimated US$30 billion in losses.[3] These serial shocks demonstrate that climate displacement is not a looming threat but an existing reality. The number of people who have been forced to leave their homes and are now living in cities like Karachi is very high. This affects the city's infrastructure, housing and basic facilities such as water and food, which has created a problem in an already burgeoning city.[4]

The current migration scholarship falls short of understanding the Pakistani case. Conventional push-pull models are based on viewing migration as a result of economic scarcity and opportunity structures.[5] However, these models only analyse migration in terms of rational choice, while failing to account for the inter-layered relationship between climatic shocks, political economy, and governance vulnerability. Equally, while non-migration literature has highlighted the role of place attachment, civic context and social networks is encouraging people to remain in place. Such perspectives risk overestimating the durability of 'in situ' resilience.[6] In Pakistan, the cumulative effects of environmental shock together with poor institutional mechanisms, make it increasingly difficult to remain put in affected areas. The connection that people have to their land and communities may postpone migration; however, eventually under persistent stress, migration becomes inevitable.

This article addresses these gaps by applying a compound displacement framework. It brings in Jamie Draper's pluralist approach, which conceives displacement as multi-causal, recognizing that climate

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[2] Thomas Kirsch et al., 'Impact of the 2010 Pakistan Floods on Rural and Urban Populations at Six Months,' *PLOS Currents Disasters*, 2012, https://currents.plos.org/disasters/article/impact-of-the-2010-pakistan-floods-on-rural-and-urban-populations-at-six-months/.

[3] World Bank Group. *Pakistan Floods 2022: Post-Disaster Needs Assessment*, (Washington DC: World Bank, 2022).

[4] *Climate-Induced Security Threats to Pakistan* (Islamabad: Center for Research and Security Studies, 2023). https://crss.pk/wp-content/uploads/2023/07/Climate-Induced-Security-Threats-to-Pakistan.pdf

[5] Everett S. Lee, 'A Theory of Migration,'*Demography*Vol.3, No. 1 (1966), pp. 47-57, https://doi.org/10.2307/2060063

[6] Helen Adams, 'Why Populations Persist: Mobility, Place Attachment and Climate Change,' *Population and Environment,* Vol. 37 (2016), pp. 429-48. https://doi.org/10.1007/s11111-015-0246-3

shocks rarely operate in isolation but intersect with political and economic pressures.[7] Further, it incorporates the notion of environmental instrumentalism, which highlights how elite control and institutional capture shape the degree to which societies can absorb or adapt to climate shock.[8]

Institutional vulnerability transforms ecological risks into mass displacement, in situations of weak governance, such as in Pakistan, compromising resilience and promoting mobility.[9] The usefulness of this model is that it provides a way of viewing climate migration not only as a simple reaction to environmental pressures, but also as complex displacement. Under this model, it becomes clear that the combination of environmental disturbance and institutional deficiencies has the effect of converting an initial shock into a permanent form of migration. Such a model also allows for a critique of migration studies.[10] In Pakistan, ecological stress and fragility of institutions has made non-migration unsustainable. Instead, the dominant trajectory is permanent relocation, into precarious urban settlements.

To draw on these dynamics, this article assesses two critical case sites. First, there is Gilgit-Baltistan in the northern regions of Pakistan, which is prone to the phenomenon of rapid glacial retreat and GLOF hazards due to thousands being displaced from their ancestral homes due to flood hazards, landslides, and avalanches.[11] The occurrence of such calamities in this region has posed a challenge to the deeply embedded cultural connection of the local populace to their homeland, resulting in entire

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7 Jamie Draper, *Climate Displacement* (Oxford: Oxford University Press, 2023).

8 John Dewey, *The Public and Its Problems* (New York: Henry Holt and Company, 1927).

9 United Nations Development Programme (UNDP). *Anticipating the Impacts of Climate Change Related Human Mobility in Pakistan and Viet Nam*. New York: United Nations Development Programme, 2024.

10 Vally Koubi, Gabriele Spilker, Lara Schaffer, and Thomas Bernauer. 'Environmental Stressors and Migration: Evidence from Vietnam,' *World Development,* Vol. 79 (2016), pp. 197-210. https://doi.org/10.1016/j.worlddev.2015.11.016

11 Aamer Bilal Sheikh, Imran Ahmad Rana, Sohail Saeed Shah, and Ghulam Mohuddin, 'Climate Change and Glacial Lake Outburst Flood (GLOF) Risk Perceptions: An Empirical Study of Ghizer District, Gilgit-Baltistan, Pakistan,' *International Journal of Disaster Risk Reduction* 83 (2022): 103392, https://doi.org/10.1016/j.ijdrr.2022.103392

villages becoming uninhabitable. Second, there is the case of Keti Bunder in coastal Sindh.[12]

In this region, migration is not a linear process, but one involving a combination of displacement processes. This involves linking ecology to institutional failures where temporary challenges lead to permanent migration pathways. It is also in this regard that we are able to conduct non-migration scholarship. Place-based resilience and cohesion may account for immobility in certain cases.[13] However, in Pakistan, with the level of ecological and institutional risks, permanency of non-migration is unattainable. Karachi, Pakistan's largest urban centres now attracting more migrants. Climate-induced rural-to-urban migration is increasingly taking place through informal slum communities in the periphery of Karachi, making Karachi an urban centre that is highly vulnerable to such changes. Rather than offering protection, this migratory pattern has merely re-contextualized the risk under another guise, thus demonstrating that the climate migration dynamic does not exist without its underlying structural inequalities. It is high time that the urban nature of displacement is recognized by migration-environment studies that have traditionally considered rural displacement only, ignoring urban pressures on governance.

This study makes six key contributions to the literature. First, it advances migration scholarship by exposing the limitations of conventional push-pull and non-migration theories, highlighting how multi-causal perspectives and environmental frameworks offer a more nuanced explanation for why populations are compelled to leave unstable regions.

Second, it provides a close, comparative examination of Pakistan's two most exposed areas; the glacial north and coastal south, to illustrate how institutional vulnerability and environmental stresses converge, creating permanent displacement. Third, it places the cases of Gilgit-Baltistan and Keti Bunder within Pakistan's larger climate vulnerability to reveal their common exposure to governance and ecological stress.

Fourth, it synthesizes the main findings on perception, institutional vulnerability, and resettlement in the long term, with a specific focus on Karachi as the primary host of climate-displaced individuals. Fifth, it adds to the theoretical discourse by revisiting some of the past concepts of

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[12] Eric Shahzar, *The Broken Ground: Unpacking Pakistan's Climate Displacement Crisis* (Islamabad: Jinnah Institute, 2025).

[13] Vally Koubi, Gabriele Spilker, Lara Schaffer, and Thomas Bernauer, 'Environmental Stressors and Migration: Evidence from Vietnam,' pp. 197-210.

migration as mobility guided by accumulated experience and past adaptation behaviour. Finally, it ends with policy recommendations, urging the need for anticipatory planning for relocation and institutional reorganization to meet the emerging trend of compound displacement.

Conceptual framework:

Beyond push-pull models to layered casualty

Push theory has long been used to explain migration, typically on the assumption of rational choice whereby individuals weigh risks and opportunities before deciding to move. Previous studies focused on business cycles and chain migrations, with the migration of immigrants from recruiting nations in the 1960s greatly influenced by demand-pull and supply-push factors. Nonetheless, even in refugee migration, it has been discovered that economic considerations play a role in the migrants' choice of destination state, showing that a voluntarist theory of migration is not entirely accurate.[14] Modern research has shifted towards push-pull plus, where migration is considered multi-factorial in that it has multiple causes ranging from predisposing, proximal, precipitating, and mediating, all of which interact in affecting individuals' decision to migrate or stay behind.[15] Even international organizations, such as the IOM (International Organization for Migration),[16] and IPCC (Intergovernmental Panel on Climate Change), recognize these factors as critical.[17] This layered causality is especially salient in Pakistan, where sudden climate shocks, including ice-lake outbursts and flash floods regularly compress decision windows and transform mobility into a forced necessity rather than a planned choice.[18]

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[14] Klaus F. Zimmermann, 'European Migration: Push and Pull,' Paper presented at the Annual Bank Conference on Development Economics, World Bank, Munich, 1994.

[15] Nicholas Van Hear, Oliver Bakewell, and Katy Long, 'Push–Pull Plus: Reconsidering the Drivers of Migration,' *Journal of Ethnic and Migration Studies,* Vol. 44, No. 6 (2017), pp. 1-18. https://doi.org/10.1080/1369183X.2017.1384135

[16] International Organization for Migration (IOM), *World Migration Report 2024* (Geneva: UN Migration, 2024).

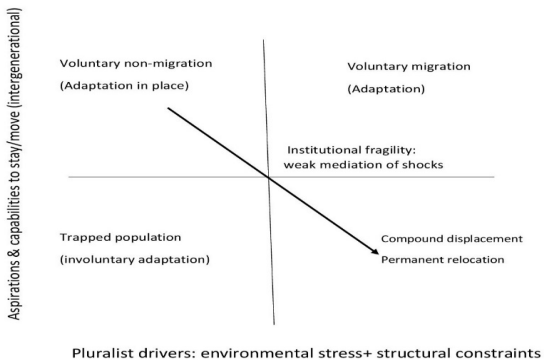
[17] Intergovernmental Panel on Climate Change (IPCC), *Climate Change 2022: Impacts, Adaptation and Vulnerability*, Geneva: Intergovernmental Panel on Climate Change, 2022.

[18] Richard Black, W. Neil Adger, Nigel Arnell, and Stefan Dercon, 'The Effect of Environmental Change on Human Migration,' *Global Environmental Change* 21, suppl. 1 (2011): S3-S11. https://doi.org/10.1016/j.gloenvcha.2011.10.001

The work on GLOF undertaken by the UNDP indicates growing dangers of outbursts in the northern region, while studies conducted on the flood events in 2010 and 2022 by the GoP, UN, World Bank, ADB, and EU have highlighted the impact of mass displacement as well as institutional deficiencies that contributed to the escalation of disaster.[19] In many districts, poor governance, poor relocation plans, poor adaptation strategies, and rural livelihoods imply that the displacement is more because of the absence of 'pull factors' in rural areas rather than urban pull factors.

Nor does the push-pull framework sufficiently address the urban destinations of climate migration. In the city of Karachi, migration tends to be funneled to informal settlements, characterized by weak land ownership, overpopulation, and inadequate infrastructure that further perpetuate vulnerability and constrain opportunities for adaptation.[20] For instance, in coastal Sindh, the Indus Delta region represents a situation where salinization and rising sea levels coincide with declining fish stocks, insecure land ownership, and governmental neglect, resulting in unsustainable livelihoods and leading to the ultimate displacement of people from sites such as Keti Bunder.[21] Thus, Pakistan can no longer be analysed using the push-pull approach; rather, it is more realistic to view Pakistan's climate migration as a cumulative process.

Figure 1 Conceptual Framework of Compound Displacement: Pluralist Drivers,



[19] World Bank Group. *Pakistan Floods 2022: Post-Disaster Needs Assessment* (Washington DC: World Bank, 2022).

[20] United Nations Human Settlements Programme (UN-Habitat), *Pakistan Country Report 2023* (Nairobi: UN-Habitat, 2023).

[21] Ghulam Rasul, Azhar Mahmood, Asrar Sadiq, and Sardar Imran Khan, 'Vulnerability of the Indus Delta to Climate Change in Pakistan,' *Pakistan Journal of Meteorology,* Vol. 8 (2012).

Intergenerational capabilities and institutional fragility

This model combines elements of the pluralistic and instrumentalist approaches within a generational context. The horizontal axis shows pluralistic factors (the convergence of ecological crises with political, social, and economic institutions). The vertical axis represents ambitions and abilities of staying or migrating that are passed from generation to generation. Each of the quadrants corresponds to migration and non-migration. The arrow illustrates how institutional weakness undermines resilience and results in drifting toward complex displacement.

Axes: pluralist drivers and intergenerational endowments

The horizontal axis of the framework reflects Draper's view that displacement is a multi-causal phenomenon.[22] Climate threats are not an independent variable; they are interconnected with histories of economic marginalization, poor infrastructure, political disenfranchisement, and social differentiation. For instance, in Gilgit-Baltistan, the physical threat of glacial melt is compounded by infrastructural neglect, poverty, and weak institutions.[23] Likewise, the impacts of rising sea level and salinization in coastal Sindh are interconnected with agrarian decline, dispossession, and market exclusion to compel migration.[24]

The vertical (y) axis shows Mallick and Hunter's appeal for attention towards aspirations inherited and passed on between generations.[25] Decisions to remain or to move are not solely responses to immediate climate pressures; they are shaped by memories of past migration, place-based attachments, inheritance systems, and gendered roles. Place attachment and civic context have often been shown to anchor households

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[22] Jamie Draper, 'Climate Change and Displacement: Towards a Pluralist Approach,' *European Journal of Political Theory,* Vol. 23, No. 1 (2024), pp. 44-64, https://doi.org/10.1177/14748851221093446

[23] Syed Samad Shah, Irfan Ahmad Rana, Saad Saleem Bhatti, and Saqib Azam, 'Assessing Urbanization and Climate Change Impacts on Environmental Sustainability in Gilgit City, Pakistan: A Driver-Pressure-State-Impact-Response Framework Approach,' *Discover Cities* Vol. 2 (2025), p. 72.

[24] Kanwal Sidra, Xiangdong Ding, Muhammad Sajjad, and Sajid Abbas, 'Three Decades of Coastal Changes in Sindh, Pakistan (1989-2018): A Geospatial Assessment,' *Remote Sensing,* Vol.12, No. 1 (2020), p. 8, https://doi.org/10.3390/rs12010008

[25] Lori M. Hunter, Juanita J. Luna, and Richard M. Norton, 'Environmental Dimensions of Migration,' *Annual Review of Sociology,* Vol. 41 (2015), pp. 377-397.

in situ,[26] while social networks can provide temporary resilience during and after extreme events.[27] However, in fragile states such as Pakistan, these attachments are themselves precarious, eroded by repeated shocks, and inadequate state support.

Quadrants: four possible outcomes

The quadrants in Figure 1 illustrate the interaction between pluralist drivers (horizontal axis), and intergenerational aspirations and capabilities (the vertical axis). The first quadrant, voluntary non-migration or adaptation in place (upper left), reflects households that attempt to remain in situ, drawing on cultural attachments, memory, and local coping strategies. Although this form of immobility was initially viable, resilience was progressively undermined by frequent climate shocks and a lack of institutional support. Eventually, adaptations such as borrowing, makeshift repairs, and livelihood changes grow increasingly tenuous when faced with repeated disruptions.

The second quadrant of adaptation or migration (top-right) represents households that have mobility as a strategic tool for adaptation. This refers to migration that is done for educational or job purposes and migration aimed at generating income through sending remittances back to home. But this outcome is restricted within weak institutional settings like Pakistan. It is only a few privileged families that benefit from migration as they have the necessary wherewithal and information for the same.

In the third quadrant, referred to as the populations that cannot migrate even when they want to move because of trapped population or involuntary non-migration (lower-left), households that desire to migrate face obstacles to their migration such as poverty, restrictions due to social norms, insecurity and lack of social capital. The third quadrant brings to light an aspect of immobility that tends to go unnoticed by the conventional push-pull theories as the latter seem to imply that the presence of risk triggers migration. The fact of the matter is that households are often trapped in immobility without any way out as they continue to be at greater and greater risks.

The fourth quadrant refers to compound displacement resulting in permanent relocation (lower right). This occurs where risks persist

[26] Helen Adams, 'Why Populations Persist: Mobility, Place Attachment and Climate Change,' *Population and Environment* ,Vol. 37, No. 4 (2016), pp. 429-448, https://doi.org/10.1007/s11111-015-0246-3

[27] Ibid.

alongside limited institutional capacity and families are compelled to show irreversibility of mobility. In the case of Pakistan, the migration usually results in informal settlements with bad infrastructural facilities. Such settlement areas are actually sources of vulnerability rather than safety.

The arrow: institutional fragility and the erosion of resilience

Institutional fragility acts as an intermediary variable that transforms environmental threats into displacement crises, as indicated by the arrow in Figure 1. Although the pluralist approach underscores the multiplicity of factors contributing to migration, it should be noted that the environmental instrumentalism paradigm places more emphasis on the importance of institutions in these processes.[28] Institutional fragility can take many different forms in Pakistan. Disaster management in Pakistan remains largely reactive, mobilizing large -scale relief after events such as the 2010 and 2022 floods, without corresponding frameworks for planned relocation or long-term rehabilitation.[29]

Disintegration of governance and corruption further erodes the adaptive ability of the state, making communities dependent on informal coping strategies that are themselves compromised. At the same time, unchecked and poorly organized urbanization channels displaced people into low-infrastructure high-density settlements, resulting in vulnerability cycles.[30] Together, these vulnerabilities create a temporal drift along the quadrants; resilience in location is weakened, voluntary mobility choices dwindle, and locked-in populations become unsustainable, ultimately driving households into the lower-right quadrant of compound displacement and permanent resettlement.

This framework contributes to migration scholarship by naming and conceptualizing the emergent dynamics of compound displacements. It enriches the current debate in three ways. First, it recasts climate mobility through an extension of Draper's pluralist framework but a

[28] John Dewey, *The Public and Its Problems* (New York: Henry Holt and Company, 1927).

[29] Muhammad Siddique Akbar, Muhammad Rizwan Safdar, and Farhan Navid Yousaf, 'Status and Social Capital: A Cross-Sectional Quantitative Investigation of Flood Survivors in South Punjab, Pakistan,' *International Journal of Disaster Risk Science,* Vol.13 (2022), pp. 549-560, https://doi.org/10.1007/s13753-022-00427-0

[30] World Bank, *Fact Sheet: World Bank's Engagement in Karachi* (Washington DC: World Bank, 2021).

rejection of the deterministic 'climate refugee' paradigm.[31] Compound displacement reframes migration not as a direct consequence of ecological disruption, but as the product of the complex interaction between ecology and institutions moderated by inequality and governance.

The second point made is that the concept highlights the boundaries and frailty of resilience itself. Although other theories have focused on the importance of the connections to the environment, cultural ties, and social bonds in ensuring that people remain rooted, such connections become impossible in the situation of constant vulnerability.[32] In the presence of recurrent shocks and lack of institutional backing, resilience gives way to displacement.[33]

Third, the conceptualization addresses the unique trajectory of displacement. Although pluralist approaches account for the complexity of causation, the notion of compound displacement reflects the cumulative and concentrated impact of displacement on urban fringe areas. In Pakistan, cities such as Karachi are displacement crucibles of adaptation and vulnerability, where displaced individuals are channelled into wildly insecure urban environments.[34]

Case study: Pakistan's climate hotspots

Glacial Lake Outburst Floods and migration

The Himalayan glaciers have undergone unprecedented ice loss, melting ten times faster in recent decades than the historical average over the past 400-700 years. Alarmingly, this steep decline has resulted in an estimated 40 per cent loss of glacier mass, shrinking from 28,000 km to

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[31] Jamie Draper, 'Climate Change and Displacement: Towards a Pluralist Approach,' *European Journal of Political Theory,* Vol. 23, No. 1 (2024), pp. 44-64; Giovanni Bettini,' Climate Barbarians at the Gate? A Critique of Apocalyptic Narratives on 'Climate Refugees,' *Geoforum,* Vol. 45 (2013), pp. 63-72, https://doi.org/10.1016/j.geoforum.2012.09.009

[32] Carol Farbotko, 'Wishful Sinking: Disappearing Islands, Climate Refugees and Cosmopolitan Experimentation,' *Asia Pacific Viewpoint,* Vol. 51, No. 1 (2010), pp. 47-60, https://doi.org/10.1111/j.1467-8373.2010.001413.x.

[33] Elizabeth Ferris, *Planned Relocation, Disasters and Climate Change: Consolidating Good Practices and Preparing for the Future* (Washington DC: Brookings Institution, 2016).

[34] World Bank, *Fact Sheet: World Bank's Engagement in Karachi* (Washington DC: World Bank, 2021).

19,000 km.[35] As glaciers retreat at an accelerated and unsustainable rate, they intensify a widespread climate-driven displacement crisis. Since glaciers are receding at an alarming and unsustainable pace, their role is to further aggravate the already prevalent phenomenon of climate-induced displacements. In countries with mountains, Glacial Lake Outburst Flooding (GLOF) results in the devastation of villages and causes a humanitarian crisis for local populations.

Pakistan has over 7,000 glaciers, one of the highest concentrations in the world. However, owing to the worsening impact of global warming, up to 80 per cent of their volume could be lost within this century if global greenhouse gas emissions are not considerably reduced.[36] Glacial melting is likely to trigger a devastating displacement crisis. More than 48,000 people in Gilgit-Baltistan and Chitral are critically exposed to glacial lake outburst floods and landslides, further adding to the vulnerability of the region to climate-related disasters. When such glacial lakes become saturated to critical levels, they overflow, releasing floods of water and debris and, destroying nearby communities. For isolated mountain populations, migration to safer ground becomes the only viable survival strategy, further straining regions that are already under socio-economic and environmental pressure. This accelerating threat highlights the necessity of effective mitigation and adaptation planning to meet the short- and long-term challenges of climate-related displacement. The fiscal damage caused by climate-related catastrophes continues to rise, surpassing US $18 billion in damage and projected to reach $40 billion in the near future.[37] As glacial melting accelerates, the need for disaster management and anticipatory climate policies has increased.

Coastal livelihood disruption and mobility

The coastal region of Pakistan is experiencing climate displacement, which is a gradual, complex process, comprising a mix of permanent, forced and voluntary migration. Coastal inhabitants are currently more vulnerable to the devastating impacts of climate change, including

[35] Eric Shahzar, *The Broken Ground: Unpacking Pakistan's Climate Displacement Crisis* (Islamabad: Jinnah Institute, 2025).

[36] Joanna Adhem, 'Washed Away: Pakistan's Melting Glaciers Threaten Millions with Dangerous Flooding,' *Euronews*, June 28, 2023, https://www.euronews.com/green/2023/06/28/washed-away-pakistans-melting-glaciers-threatens-millions-with-dangerous-flooding

[37] Hélène Fuje, Jian Yao, Samantha M. Choi, and HoudaMighri, 'Fiscal Impacts of Climate Disasters in Emerging Markets and Developing Economies,' IMF Working Paper no. 2023/261. Washington, DC: International Monetary Fund, 2023, https://doi.org/10.5089/9798400262913.001

intense storms, floods, coastal erosion, and sea-water intrusion. Individuals already living in poverty are relatively exposed, as even a minor shock sets them on the path to permanent poverty. Thus, climate change is the hardest in these poor areas and worsens their socio-economic suffering. The worst hit by the climate catastrophe are people dwelling at the edges of Pakistan's coast along the Indus Delta region. The Indus Delta, the world's fifth-largest delta, is rapidly disappearing owing to the cumulative implications of an increase in sea levels, water intrusion, and increasing soil erosion along Pakistan's coastal belts. At the same time, decreased water inflow from the erstwhile prosperous Indus River further contributed to the depletion of the delta. Since 1993, the deltaic coast has moved substantially 22km inland, threatening a severe loss of life and livelihood.[38] However, with no systematic population data and displacement tracking being mostly ad hoc and only performed during disasters, it is not known how many people and houses have been impacted over the years.

The lack of systematic data collection prevents effective policy interventions and long-term planning for vulnerable populations. However, conservative estimates point to over 1.2 million already displaced individuals, and approximately 4.2 million acres are engulfed by the ocean. These figures, likely under-reported, highlight the urgent need to develop effective climate adaptation strategies to address the growing displacement crisis in the region.

From rural decline to urban settlement

Following the gradual loss of coastal land and freshwater resources, climate change is restructuring livelihood options in Pakistan's Indus Delta, with households increasingly pushed to relinquish customary professions. Traditionally, the Keti Bunder and the surrounding coastal villages have depended on farming and small-scale cultivation. Penetration of the sea, salinization of land, and diminished freshwater flows, however, have made farming inconceivable, prompting a move towards fishing.

Surveys have shown, 77 per cent of household heads in Keti Bunder are sole fishers.[39] At the wider district level, studies of Thatta (which

[38] Dorien Braam and Love Kumar, *Adapting on the Move: Climate Change Displacement and Local Solutions in Coastal Communities in Sindh, Pakistan* (Geneva: Internal Displacement Monitoring Centre, 2021).

[39] World Wildlife Fund–Pakistan (WWF Pakistan), *Study on Knowledge, Attitudes and Practices of Fisher folk Communities about Fisheries and Mangrove Resources*. (Karachi: WWF Pakistan, 2005).

encompasses Keti Bunder) indicate that as much as 90 per cent of the population relies on fishing as a main source of livelihood, although fish populations have declined by as much as 70 per cent over recent decades as a result of environmental degradation. The erosion of both agricultural and fishing livelihoods left households with few viable alternatives to migration. Researchers term this an early stage of a climate displacement crisis in southern Pakistan.[40] Local livelihood failures erode not only household earnings but also social cohesion among delta communities, where out-migration disperses kinship links and degrades place-based resilience. Migrating families, often in distress, encounter precarious conditions upon reaching their destination cities. Many are absorbed into Karachi's katchi abadis (informal settlements), which already lack secure tenure, sanitation, and basic infrastructure.[41] Rather than providing stability, such settlements reproduce vulnerability in new forms, shifting the burden of adaptation from rural communities to under-resourced urban centres.

This trajectory is supported by trends in neighbouring Bangladesh, where climate migrants move in large numbers to the urban slums of Dhaka.[42] Karachi is estimated to receive a comparable influx, with internal climate migrants projected to reach three million by 2050.[43] Karachi is already one of the world's top ten cities vulnerable to climate-based migration, along with Bogotá, Amman, and Freetown.[44] Without adequate anticipatory movement and urban planning, these flows tend to overwhelm the infrastructure of the city, concentrate poverty, and intensify environmental pressure.

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[40] Muhammad Siddique Akbar, Muhammad Rizwan Safdar, and Farhan Navid Yousaf, 'Status and Social Capital: A Cross-Sectional Quantitative Investigation of Flood Survivors in South Punjab, Pakistan,' *International Journal of Disaster Risk Science* 13, no. 4 (2022) , pp. 549-560, https://doi.org/10.1007/s13753-022-00427-0

[41] World Bank, *Fact Sheet: World Bank's Engagement in Karachi (*Washington, DC: World Bank, 2021).

[42] Bishawjit Mallick and Lori M. Hunter, 'Environmental Migration and Non-Migration: Learning through an Intergenerational Lens,' *Migration Studies* 12, no. 4 (2024), https://doi.org/10.1093/migration/mnae031.

[43] World Bank, *Groundswell: Preparing for Internal Climate Migration* (Washington DC: World Bank, 2018)

[44] World Bank (2018)

Findings

Perceptions

Community perceptions shape how risks are understood, narrated, and acted upon in the context of environmental stress. In migration-environment research, perceptions have been linked to *decisions to stay* and to *decisions to move*. They influence not only the timing of mobility but also its framing, whether relocation is seen as a temporary coping measure or an inevitable long-term solution.[45]

In Pakistan's northern highlands, households in the highly GLOF-prone region of Gilgit-Baltistan are acutely aware of the glacial instability. NGO evaluations and regional accounts regularly suggest that glacial lake outburst floods (GLOFs) and landslides can render villages unliveable.[46] However, these perceptions are frequently mixed with cultural and religious affinities for mountains, as well as ancestral roots on land. Locals often interpret hazards through spiritual or fatalistic perspectives. Weak institutional preparedness and limited early warning systems further reinforce the dependence on traditional coping strategies. These attachments postpone relocation decisions until a disaster occurs, consistent with evidence elsewhere that illustrates how place-based identities promote risk normalization and acceptance of repeated hazard exposure.[47]

On the other hand, people in the coastal areas of Sindh view their future in terms of inevitability. People in the Keti Bunder area regard their farming and fishing professions as 'lost already' because of salinity, reduced fisheries, and cyclones.[48] For example, risk awareness here is associated not with the resistance to movement but with resignation; the

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[45] Bishawjit Mallick and Lori M. Hunter, 'Environmental Migration and Non-Migration: Learning through an Intergenerational Lens,' *Migration Studies* 12, No. 4 (2024), https://doi.org/10.1093/migration/mnae031.

[46] Syed Samad Shah, Irfan Ahmad Rana, Saad Saleem Bhatti, and Saqib Azam, 'Assessing Urbanization and Climate Change Impacts on Environmental Sustainability in Gilgit City, Pakistan: A Driver-Pressure-State-Impact-Response Framework Approach, '*Discover Cities* 2 (2025), p. 72.

[47] Koko Warner and Tamer Afifi, 'Where the Rain Falls: Evidence from 8 Countries on How Vulnerable Households Use Migration to Manage the Risk of Rainfall Variability and Food Insecurity,' *Climate and Development* 6, No. 1 (2014): 1–17, https://doi.org/10.1080/17565529.2013.83570

[48] Syed Manzoor-ul-Haque Qureshi, 'The Fast-Growing Megacity Karachi as a Frontier of Environmental Challenges: Urbanization and Contemporary Urbanism Issues, '*Journal of Geography and Regional Planning,* Vol. 3, No. 11 (2010), pp. 306-321.

option to move is perceived less as an opportunity and more as a last inevitable solution. For example, women and younger people usually express their sense of resignation even more emphatically, connecting the destruction of the environment with the destruction of their social identity. This reflects empirical knowledge indicating that in situations of social exclusion, the perception of inevitability serves as a sign of the lack of alternative adaptation opportunities or institutional support for these efforts.[49]

Contrast Gilgit-Baltistan with Keti Bunder to illustrate one key theoretical concept: perceptions are situational. When cultural affiliation and land attachment are strong, perceptions can delay movement even in the wake of increasing hazards. Where life itself is degraded beyond redemption, perceptions become fatalistic. Nevertheless, in either scenario, since there is no planned movement on behalf of people, the absence of which renders movement a compulsion rather than choice, the mechanics of compound displacement are further reinforced.

These findings enrich the field of migration studies by revealing the two-faced nature of perceptions both as a source of strength and as a measure of weakness. It becomes clear that perceptions are not easily explained in the abstract, and must rather be considered in their larger context. In Pakistan, awareness of risks is always linked with poor governance, creating routes where migration is not a choice, but an obligation.

Institutional fragility

Although perception influences the experience of climate risks, institutional structures play an important role in deciding if the effects lead to displacement. The disaster management system of Pakistan is characterized by fragmentation within the federal government, provincial government, and district government along with the NDMA, PDMAs, and DDMAs. The respective agencies in these entities tend to share similar mandates, meagre resources, and poor coordination, leading to reactive as opposed to anticipatory efforts.[50]

This institutional fragility was starkly revealed in the Post-Disaster Needs Assessment (PDNA) for the 2022 floods, undertaken jointly by the

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[49] Giovanni Bettini, 'Climate Barbarians at the Gate? A Critique of Apocalyptic Narratives on 'Climate Refugees,' *Geoforum* 45 (2013): 63–72, https://doi.org/10.1016/j.geoforum.2012.09.009

[50] Muhammad Siddique Akbar, Muhammad Rizwan Safdar, and Farhan Navid Yousaf, op. cit. pp. 549-560, https://doi.org/10.1007/s13753-022-00427-0

Government of Pakistan, the World Bank, the Asian Development Bank, the European Union, and the United Nations Development Programme, estimated US$14.9 billion in damages and US$15.2 billion in losses, calling for a minimum of US$16.3 billion for resilient reconstruction.[51] These numbers far surpassed the available grant finance, with Pakistan depending on debt instruments that make it more fiscally vulnerable. Humanitarian needs assessments identified donor contributions to be far below those following the 2010 floods, and survey data indicated gaps in the coordination, accountability, and fair distribution of aid.[52]

A year after the floods, the recovery of housing in Sindh province demonstrates the extent of institutional weakness. The provincial government of Sindh confirmed that it had completed less than 8 per cent of its target of rehabilitating two million collapsed houses. Some of the key projects such as Sindh Flood Emergency Housing Reconstruction Project (SFEHRP), funded by the World Bank, and Sindh Emergency Housing Reconstruction Project, sponsored by the Asian Development Bank, became active only in 2024 and would run till 2027-2028 (Asian Development Bank, project 57323-001).[53] This demonstrates the years needed for recovery when millions of people are living in makeshift shelters.

On the policy front, 2023 marked the creation of Pakistan's first-ever NAP (National Adaptation Plan), laying out strategies for mainstreaming climate adaptation, resource mobilization, and monitoring and evaluation. Although this is an encouraging move, it is evident that this plan recognizes the lack of capacity on both fronts.[54] In a similar manner, the National Disaster Mitigation Plan and Monsoon Contingency Plan of NDMA for 2025 demonstrate an understanding of the problem, but the plans lack a connection between policies and capacities at provincial and local levels.

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[51] United Nations Development Programme (UNDP), *Handbook for Disaster Risk Management: GLOF-II Pakistan*, (Islamabad: United Nations Development Programme, 2022).

[52] United Nations, *Pakistan 2022 Floods Response Plan – August 2022*, Islamabad: Office for the Coordination of Humanitarian Affairs (OCHA) / United Nations in Pakistan, 2022.

[53] Asian Development Bank (ADB), *Project 57323-001: Sindh Emergency Housing Reconstruction Project*. Manila: Asian Development Bank, https://www.adb.org/projects/57323-001/main

[54] Government of Pakistan. *National Adaptation Plan of Pakistan*, Islamabad: Government of Pakistan, 2023, https://unfccc.int/sites/default/files/resource/National_Adaptation_Plan_Pakistan.pdf

The number of displacements is another issue that bears out institutional failures. According to the Internal Displacement Monitoring Centre, the figure for internal displacements from disasters in 2022 was 8.2 million, which is the highest number recorded in Pakistan.[55] Two-thirds of these were from Sindh province, and the majority of people were still in emergency shelter camps as of 2023, according to the Office for the Coordination of Humanitarian Affairs.[56] In urban centres, such as Karachi, where there is poor governance, climate refugees live under precarious situations[57].

Planned relocation

The phenomenon of climate displacement in Pakistan continuously emphasizes the need for planned relocation as a long-term solution, as compared to short-term evacuation, which provides temporary security to displaced persons. Temporary refuge and settlement camps help protect people temporarily, while planned relocation aims at providing a permanent solution for people who have been constantly exposed to the environment's hazards.

According to the Brookings-UNHCR-Georgetown Initiative, planned relocation is 'a process whereby people or a group of people move or are helped to move away from their place of origin, settle in another area, and have access to everything necessary to start a new life.'[58] Although there is increasing awareness of the need for a plan, no such framework exists in Pakistan. Relocation remains an ad hoc process, with people from Gilgit-Baltistan and the Indus Delta having to relocate to Karachi slums by themselves.

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[55] Internal Displacement Monitoring Centre (IDMC), *Pakistan: Displacement Associated with Disasters (2022)* (Geneva: Internal Displacement Monitoring Centre, 2023).

[56] United Nations. *Pakistan 2022 Floods Response Plan – August 2022.* Islamabad: Office for the Coordination of Humanitarian Affairs (OCHA) / United Nations in Pakistan, 2022.

[57] World Bank. *Fact Sheet: World Bank's Engagement in Karachi*.(Washington DC: World Bank, 2021).

[58] Brookings Institution, Georgetown University, and United Nations High Commissioner for Refugees (UNHCR), *Guidance on Protecting People from Disasters and Environmental Change through Planned Relocation*, Brookings–UNHCR–Georgetown Initiative, 2015. https://www.brookings.edu/wp-content/uploads/2016/06/GUIDANCE_PLANNED-RELOCATION_14-OCT-2015.pdf

Unlike Fiji, where plans exist for the relocation of 42 villages, and six villages have already been relocated through planned efforts, it is evident that Pakistan faces gaps in this respect. The same applies to the resettlement effort in the Philippines after Yolanda, where haste trumped consultation.[59] These examples illustrate that effective planned relocation requires anticipatory policymaking, public participation, and inter-sectoral coordination, which are still absent on a large scale in Pakistan's current disaster -governance framework.

In Pakistan, where projections suggest that over three million residents may be forced to relocate to Karachi as climate migrants by 2050,[60] unplanned relocation risks exacerbate urban precarity. Slum settlements in Karachi are already strained, with insecure tenures, poor sanitation, and limited access to basic services. In the absence of anticipatory relocation policies, migration continues to be absorbed into slums, generating what can only be described as an unplanned, extended displacement.

Conclusion

In this paper, climate migration in Pakistan has been analysed by taking a dual perspective of pluralist displacement theory and environmental instrumentalism and has concluded that compound displacement takes place in Pakistan due to the combination of environmental shocks and weak institutions leading to turning temporary displacements into permanent migrations into cities. The findings presented from two climate frontier areas of Gilgit-Baltistan, affected by melting glaciers and GLOFs, and Keti Bunder, affected by rising sea levels, salinity, and cyclones, prove that despite the strong bond people have with their land, the losses suffered by them are overwhelming. The empirical pattern that follows is a sustained flow into Karachi's informal settlements, where displacement resolves not in short-term shelters but in long-term precarious urban residences.

Theoretically, the analysis shows why push-pull models and non-migration perspectives are insufficient. Push-pull accounts understate the role of governance capacity and path dependence; non-migration work privileges household capabilities, and attachment while underestimating

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[59] J. Gaillard, Conrad C. Liamzon, and Jennifer Villanueva, 'Natural' Disaster? A Retrospect into the Causes of the Late-2004 Typhoon Disaster in Eastern Luzon, Philippines, *Environmental Hazards* 7, No. 4 (2007), 257-270, https://doi.org/10.1016/j.envhaz.2006.11.002

[60] World Bank, *Groundswell: Preparing for Internal Climate Migration* (Washington DC: World Bank, 2018).

the thresholds at which habitability is breached. A pluralist approach clarifies that climate triggers are entangled with political economy (land tenure insecurity, market exclusion, infrastructural neglect), and environmental instrumentalism specifies the mechanism by which weak institutions magnify hazards through reactive disaster relief, absence of planned relocation, and fragmented urban governance. Pakistan's trajectory, therefore, contributes to migration theory by foregrounding institutions as the decisive mediator between hazard and mobility outcome, and by locating climate mobility's endpoint in permanent urban settlement rather than cyclical movement.

Empirically, this study synthesized three cross-cutting findings. First, perceptions: vulnerable populations increasingly perceive climate risk as existential as opposed to episodic. Migration is framed as unavoidable where no available, credible in-situ alternatives exist. Second, institutional vulnerability: disaster recovery timelines, problems of intergovernmental coordination, and limited displacement data turn short-term problems into protracted crises. Third, relocation: in the vacuum of policy, movement occurs as unplanned, household-led resettlement into Karachi's katchi abadis, amplifying pressures on housing, water, sanitation, and labour markets and reproducing vulnerability in new spatial forms.

The policy implications are as follows. Pakistan requires a national policy of planned relocation that:- (i) identifies highly exposed communities in mountain and coastal ecosystems; (ii) obtains land with secure tenure arrangements; (iii) offers livelihoods, services, and connectivity in destination areas; and (iv) incorporates effective community participation in the process. Financing must be diversified: domestic, international, and climate-justice instruments, due to the high costs and limited fiscal space of the state. Critically, successful migration is not to be quantified in terms of physical movement alone; measurement should be in terms of comparable or superior standards of living, security of tenure, labour and services accessibility, and non-economic loss identification (memory, identity, cultural heritage). Without anticipatory planning for migration, Karachi will continue to struggle with uncontrolled inflows and the cyclical process of perpetual displacement and urban precarity.

Finally, the analysis revealed limitations and a research agenda. Pakistan's climate migration is changing and uneven. Longitudinal research is required to follow the path through which successive shocks redefine mobility over time, and ethnographic research must capture the lived realities of relocation to urban peripheries. A comparative South Asian scholarship can determine which outcomes are regionally common

and country-specific. Progressing this agenda and connecting compound displacement to practical planned relocation is critical if Pakistan transitions from a reactive crisis response to a proactive, equitable adaptation that saves lives, livelihoods, and dignity.