Pakistan at the Crossroads of Climate-Induced Migration: Understanding Risks and Building Resilience

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ABSTRACT

In the contemporary era, one of the defining drivers of mass human displacement, uprooting communities and disrupting the livelihood of millions across the world is climate change. In Pakistan, the fragile geography, minimal adaptive capacity, and deep-rooted socio-economic vulnerabilities are positioning the country among the top ten countries of climatic emergency. This study employs a quantitative approach to identify and analyse a complex yet interlinked interaction between climate change, particularly flood-related disasters, and the internal displacements in two of the most susceptible regions of Pakistan; areas of South Punjab (Multan, Bahawalpur and DG Khan districts) and Sindh's Coastal Belt (Malir, Sujawal and Badin districts). Evidently, there is a long history of recurring riverine floods in the Southern Punjab, however, the disaster of 2022 in the Sindh's coastal area highlights the region's first exposure to climate triggered by coastal flooding that displaced thousands. The analysis of the situation of both regions portray a concerning picture of uprooted populations, trapped in vicious cycles of loss, where years of efforts invested in building homes and sustain their livelihood can be destroyed within moments. For the analysis, to understand the magnitude of loss, vulnerability, and the assessment of this risk among these regions, this study relies on the flood related data collected by Pakistan Meteorological Department, The Urban Unit, Pakistan Disaster Management Authority, UNHCR Pakistan and the Ministry of Climate Change. Additionally, this study forecasts the future vulnerability score and adaptation potential of six districts in Punjab and Sindh and provides some grass-root level interventions to increase resilience across districts. The finding of this study reveals, the vulnerability in the Southern Punjab is being exacerbating with recurring floods, low literacy rate among communities, extensive reliance on agriculture for sustainability, and fragile infrastructure. On the flip side, the situation of Coastal areas of Sindh is even inferior, widespread dependency on fishing and agriculture, flimsy housing, lower literacy rate and inadequate adaptive capacity contributed to amplifying the effects of even a single flood in 2022. The conclusion indicate that floods are more than recurring natural hazard, they are a critical test of preparedness and resilience building among the communities. Remarkably, the flood induced displacement is triggered by a natural phenomenon but the challenges faced by affected population are aggravated by man-made structuring conditions such as socio-economic profile of a region and the insufficient responses of the government. These structuring conditions such as absence in prompt flood response, challenging socio-economic conditions, insufficient infrastructure, ineffective adaptation mechanism and negligible resilience building, collectively reshape the livelihood patterns of affected communities. Furthermore, this study contends that vulnerability in a particular region is not fixed conditions. Future displacement and associated loss can be substantially reduced through effective early warning system, targeted capacity-building measures, improved infrastructure, and a swift response of government. Ultimately, this study calls for an evidence-based adaptation strategy that centre the voices of impacted communities while moving beyond short-term humanitarian relief measures.

Keywords: *Climate-Induced Displacement, Vulnerability, Resilience, Adaptation, Risk, Hazard*

1. INTRODUCTION

Climate change is a key factor that is transforming the global patterns of human mobility and livelihood of communities, while exposing millions at risk. Each year around 20 million people forced to leave their homes in the wake of extreme weather conditions. (IDMC, 2025). The consequences of this abnormality are weather pattern are especially grave for a country like Pakistan, that ranks among top five vulnerable countries, despite of little contributions to global emission. The country's diverse profile ranging from a glacier to riverine plains and the low-lying coastal areas with a minimal adaptive potential, wide socio-economic inequalities, governance issues, all contribute to make it highly vulnerable to both sudden on-set hazards (e.g floods and glacier melt) as well as slow-onset processes (e.g rise in sea level, droughts).

Among a number of climate induced threats, flooding has emerged as one of the most severe threat. The deadly monsoon flooding of 2022, compounded by abnormal rainfall and melting of glacier has impacted 33 million people, uprooted around 8 million, killed over 1,700 people, with an economic cost of over $30 billion. (World Bank PDNA, 2022; NDMA/PDMA reports). This massive impact illustrates clearly about how pre-existing vulnerabilities interacts with the extreme climate related events to widespread a massive relocation and socio-economic devastation in the long-run.

This research analyses the Pakistan's climate vulnerabilities with an emphasis on displacement caused by flooding. The devastation caused by 2022 monsoon flooding in Punjab and Sindh is the key focus on this study. In Punjab Province, few districts of Southern Punjab districts such Multan, Bahawalpur, Dera Ghazi Khan and in Sindh Province, the Coastal Areas of Sindh such as Sujawal, Malir, and Badin which are characterized by recurring flooding are studied. The analysis of this research covers the timeframe from 2014-2024 in order to capture the long terms ramifications of exposure, relocation patterns and the altering vulnerabilities.

For assessing the climate risk, this research employs Nick Brook's quantitative conceptual framework (Brooks, 2003), white outline risk as Risk = Hazard (likelihood) x Vulnerability(severity).

In this equation, hazard states climate related abnormalities such as recurring riverine flooding or growing coastal areas threats that have the potential to disturb likelihood and normal functioning of life. Vulnerability of a particular region can be gauged by Vulnerability = (Exposure x Sensitivity) / Adaptive Capacity. In this context, Exposure refers to measure the physical damage, for instance, relocation of people, housing or crops losses etc. While Sensitivity indicates socio-economic vulnerabilities, for instance, the dependency on informal or formal form of business, reliance on fishing or agriculture, the literacy rate of a particular community or socio-economic outlook. While the adaptive capacity indicates the measurement of resilience factors such as economic diversification, existing infrastructure, the education rate etc. This approach is effective in gauging comparative vulnerability score across districts.

Moreover, this study adopts an exploratory Dynamic Vulnerability Model for future projection of temporal trends in vulnerability scores (for upcoming years from the baseline 2024 values) to demonstrate the linkages between the repeated exposure and effective adaptive responses influence over risk projection for future. Pakistan is facing a compounded high-risk scenario such as growing climate risks combined with entrenched vulnerabilities stemming from governance inadequacies, economic precarity, and poor preparedness. This study uses qualitative insights to understand the vulnerabilities of different districts in Punjab and Sindh. It emphasises grassroots actions to boost resilience and makes evidence-based, localised policy recommendations. Finally, the research recommends transitioning from reactive relief to proactive, people-centred solutions that meet immediate needs, strengthen community coping mechanisms, and protect vulnerable groups from growing climate uncertainty.

2. LITERATURE REVIEW

Scholarship on climate change, vulnerability, and human mobility emphasises that environmental catastrophes do not act alone, but rather interact with socioeconomic, institutional, and cultural contexts to cause displacement, particularly in highly vulnerable regions such as South Asia (IPCC, 2022). Climate-related disasters displace millions of people worldwide each year, with internal migration being particularly prevalent in low- and middle-income countries with weak adaptation ability (IDMC, 2023). South Asia is a hotspot for compounded threats such excessive precipitation, glacial melt, sea-level rise, and heatwaves, which are amplified by population pressures, agricultural dependency, and uneven development (IPCC, 2022).

Pakistan shows acute vulnerability despite accounting for less than 1% of global greenhouse gas emissions. The 2022 floods in Punjab and Sindh have exacerbated displacement patterns due to recurring riverine floods, flash floods, and coastal/saltwater intrusion. The torrential monsoon rains and glacial melt affected approximately 33 million people, displaced over 8 million, destroyed millions of homes and agricultural land, and caused economic losses of $30-40 billion (World Bank PDNA, 2022; Otto et al., 20). Sindh and southern Baluchistan were hit the hardest, with protracted flooding causing saline intrusion, livelihood collapse, and ongoing migration pressures in coastal districts (Sayeed et al., 2024; IOM, 2022).

Brooks' conceptual framework is quite comprehensive for comprehending these dynamics. In his Tyndall Centre Working Paper "Vulnerability, Risk, and Adaptation: A Conceptual Framework," (2003) he distinguishes hazard (climate threats), exposure (people/assets at risk), sensitivity (system susceptibility), and adaptive capacity as key components to measure the potential risk regarding climate change. He suggests Risk = Hazard × Vulnerability, with vulnerability operationalised as (Exposure × Sensitivity) / Adaptive Capacity. Human variables such as poverty, marginalisation, and inadequate governance compound natural catastrophes into disasters. This mathematical equation informs evaluations of climate-induced migration in flood-prone areas for gauging future risks; however, Brooks' work is hardly used as an analytical lens for localised case studies in the context of climate related displacement.

Adger et al. (2004), in "New Indicators of Vulnerability and Adaptive Capacity" (Tyndall Centre Technical Report 7), expand on the framework presented by Brooks by focusing on social systems and the relationship between environmental change and societal risks. The mixed-methods approach of research, which combines qualitative insights and quantitative indicators, identifies socioeconomic weaknesses such as inequality and resource access that influence community resilience. While useful for resilience framing, it provides little information on migratory paths or policy levers for displacement governance, highlighting a larger empirical gap in linking vulnerability measurements to mobility trends among displaced communities.

Pakistan-specific literature indicate additional dimensional of this issue as well, particularly the gender and child rights abuse in the wake of crisis. Abbasi et al. (2021) investigate climate-induced migration among women in Muzaffargarh and Tharparkar districts using focus groups and case studies, indicating disproportionate impacts such as increased health/safety risks, educational disruptions, and decision-making hurdles during displacement. The study criticises weak gender-sensitive policies and institutional support while advocating for inclusive adaptation. Ullah et al. (2024) research highlight the social unfairness among women during climate-induced migration, linking low socioeconomic position, sociocultural norms, and health vulnerabilities to increased suffering in rural areas, particularly during the 2022 floods.

Empirical research estimates the differential impacts of flood in different geographical regions. Studies in coastal Sindh show that saltwater intrusion is a slow-onset cause of voluntary and forced relocation, exacerbated by upstream water mismanagement and insufficient freshwater flows (Sayeed et al., 2024). Communities in districts such as Thatta, Sujawal, Badin, and Malir are facing declining agricultural and fishing livelihoods, with insufficient institutional responses worsening long-term outmigration and resilience gaps. Southern Punjab in particular is vulnerable to recurring riverine floods, confining uprooting communities in vicious cycle of loss and recovery that disturb the entire livelihood. (Khalid, 2024).

The existing post-2022 flood literature outline the key insights on the immediate and emerging effects of monsoon flooding. The "Flood Response Baseline Assessment - Sindh Province" published by IOM Pakistan in 2022 chalk out tracking and calculating the broader ramifications of the flood but overlook the long-term and sustainable efforts for socio-economic recovery and to inculcate resilience among affected communities. Likewise, the baseline evaluation report issued by RDF in Sindh district centres around short-term and reactive humanitarian needs, for instance, health, food and shelter, while overseeing the adaptive approaches to tackle future climate related disaster. Furthermore, the "Contingency Plan for 2024" share by the Irrigation Department of the Government of Sindh emphasises on the future projection and the upgradation of infrastructure only without considering the key link between exposure and comprehensive socio-economic outlook of a particular area.

Broader analysis of post flood 2022 literature confirms few emerging patterns such as the World Bank PDNA (2022) estimates poverty spikes from the floods (driving millions into poverty) and highlights governance/infrastructure flaws that turned hazards into tragedies. Additionally, machine learning-based risk assessments link 2022 inundation drivers (monsoon intensification, orographic effects) to relocation, with higher susceptibility in less urbanised, low-resilience areas (Cui et al., 2025; Kam et al., 2025). Furthermore, long-term consequences studies have highlighted cycles of trauma, livelihood degradation, and poor adaptation, with demands for locally led, inclusive recovery (e.g., indigenous knowledge integration in Sindh; vulnerability-adaptation-resilience in flood-prone areas).

Gap: Overall, substantial gaps remain despite the fact that conceptual tools (Brooks, Adger) provide solid foundations and empirical/response studies document acute crises. These include an excessive focus on short-term relief at the expense of long-term migration/resilience dynamics; a lack of decadal comparative work across regions (recurrent Punjab riverine vs. extreme Sindh coastal); a lack of integration of vulnerability indices with governance, equity (particularly gender), and grassroots solutions; and a lack of proactive, human-centered approaches beyond reactive measures.

2.1 Flood Impacts and District Profiles in Southern Punjab and Coastal Sindh (2014-2024)

The comprehensive profiles of every district in coastal Sindh and Southern Punjab is listed below. These listed accounts highlight the significant and complex disruptions brought about by frequent and severe flooding incidents during the course of the decade. The consequences of such tragedies went beyond the deaths toll, in fact it transforms the entire livelihood structure, socio-economic relations, devastation of houses, farmland, and livestock.

2.1.1 Southern Punjab:

Southern Punjab is one of the most effected regions in Punjab in the wake of climate related catastrophise, floods in particular. In year 2022, district Multan, DG Khan and Bahawalpur ranked top districts that bore the heavy burden of flooding.

2.1.2 Multan:

In last one decade, Multan district has experienced three major floods in year 2014, 2020, 2022. The 2022 floods affected an estimated 163,638 persons. While district-specific death figures are frequently combined provincially, recorded mortality remained modest as compared to other events. Significant damage to housing, crops, and livestock was reported. According to the 2023 Population and Housing Census, the literacy rate in the district is around 72.4% (man 77.3%, female 66.3%). The economy is primarily agrarian, with agriculture and livestock accounting for around 50% of livelihoods, increasing vulnerability to climate-related risks (Pakistan Bureau of Statistics, 2023; PDMA Punjab Reports).

2.1.3 Dera Ghazi Khan:

Floods in 2014, 2015, and 2022 had significant consequences in the district, displacing over 692,670 people altogether, with the 2022 disaster being the most catastrophic. The district's rural character resulted in significant agricultural losses. The 2023 Census shows an overall literacy rate of 57.8% (66.2% male, 49.2% female). The district's reliance on agriculture and cattle, combined with poor infrastructure, makes it vulnerable to periodic flooding (Pakistan Bureau of Statistics, 2023; World Bank, 2022).

2.1.4 Bahawalpur:

In Bahawalpur district, major flooding occurred in 2014, and 2020 displacing around 167,690 people, demolishing thousands of homes, and causing significant agricultural and livestock losses. The 2023 Census shows an overall literacy rate of 64.4% (69.4% male, 59.1% female). Agriculture accounts for about 45% of the GDP, leaving the people vulnerable to flood-related disruptions (Pakistan Bureau of Statistics, 2023; PDMA Punjab situation bulletins).

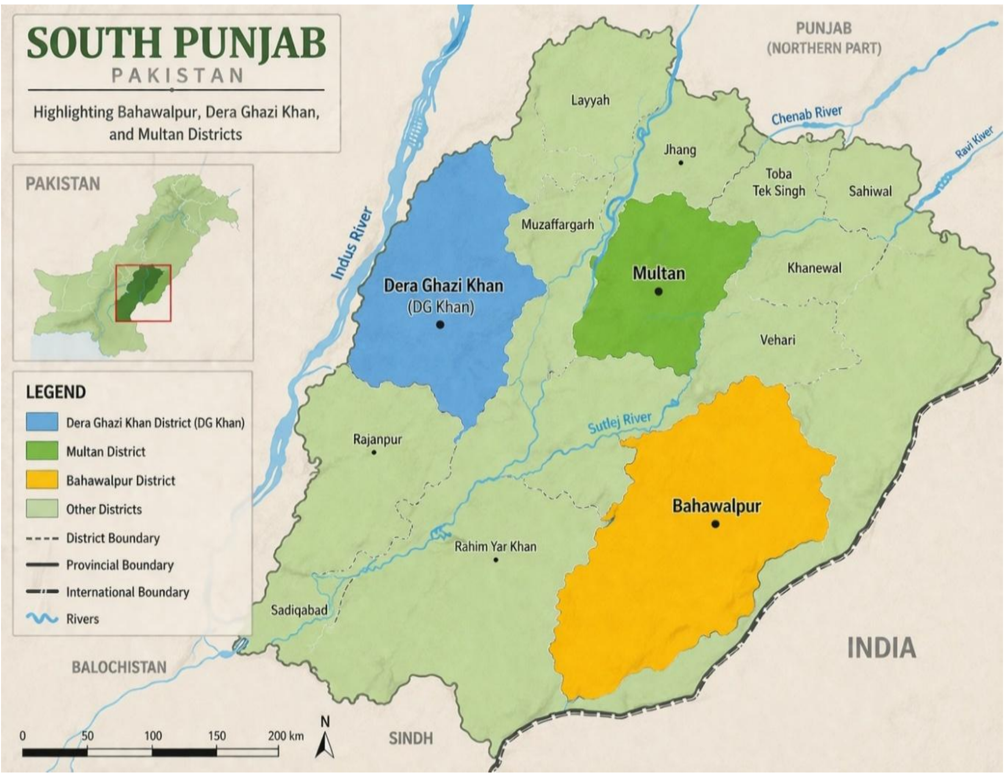

Figure 1

2.1.5 Coastal Areas of Sindh

Sindh's coastal areas had a single, catastrophic flood episode in 2022, the most damaging in a decade, exacerbated by seawater intrusion, which severely damaged livelihoods based on agriculture and fishing. The flood inflicted tremendous devastation in Badin, Sujawal, and Malir.

2.1.6 Badin:

The Badin district was hit hard in the flooding of 2022. According to reports, 2022 floods killed 45 people, displaced 277,502, lost 23,433 cattle, and completely damaged 49,125 dwellings. Saltwater incursion exacerbated the deteriorated agricultural land. Agriculture, forestry, and fishing account for roughly 66% of total employment in the economy. The 2023 Population and Housing Census indicates that the literacy rate is in the district is at 47.65% (44.46% for men and 26% for women) with only 21.6% of the people living in urban areas. (Pakistan Bureau of Statistics, 2023; PDMA Sindh, 2022; World Bank, 2022).

2.1.7 Sujawal:

The other most badly affected area of Sindh in the wake of 2022 flooding was Sujawal District. The district reported 77 fatalities, 154,000 displaced persons, significant livestock losses (7,677), and extensive property damage in 2022. Approximately 67% of district revenue comes from fishing, cattle, and agriculture. According to the 2023 Census, literacy rates are among the lowest, at roughly 38.0% overall (male 33.70%, female 19.66%), which significantly reduces adaptive capacity (Pakistan Bureau of Statistics, 2023; PDMA Sindh Flood Report, 2022).

2.1.8 Malir:

The flooding of 2022 has affected almost 17, 137 people in Malir, with an extensive cattle loss of 5, 828 and a massive crops damage. During this flood the infrastructure loss was significant and 35 people lost their lives. Notably, the region is progressively urbanized (about 48% urban), however, the larger portion of their economy is dependent on fishing, livestock and agriculture (~69% of livelihoods). Interestingly, the literacy rate in the district is comparatively high roughly 74% ((male 78%, female 70%), yet the consequences caused by floods of 2022 demands resilience building within the district. (Pakistan Bureau of Statistics, 2023; PDMA Sindh, 2022).

Figure 2

Detailed Floods Impact Summary By District (From 2014 To 2024)

Table 1 Source: Daily Situation Reports (PDMA Sindh and Punjab)

District	Floods (No. & Years)	Deaths	Houses Damaged (Partial)	Houses Damaged (Full)	Livestock Lost	Crop Loss (Ha)	People Affected	Households Affected

Multan	3 (2014, 2016, 2022)	37(est.)	32,897(est.)	28,765(est.)	6,987(est.)	545,980(est.)	163,638(est.)	39,458(est.)
DG Khan	3 (2015, 2019, 2022)	90(est.)	11,409(est.)	13,275(est.)	11,341(est.)	744,998(est.)	692,670(est.)	45,000(est.)
Bahawalpur	2 (2014, 2020)	65(est.)	36,568(est.)	6000(est.)	5,476(est.)	483,678(est.)	167690(est.)	25,876(est.)
Badin	1 (2022)	35(est.)	62, 124(est.)	49,125(est.)	23,433(est.)	226,044(est.)	17,137(est.)	55,551(est.)
Sujawal	1 (2022)	77(est.)	25,531(est.)	26,168(est.)	7,677(est.)	86,670(est.)	154,000(est.)	35,000(est.)
Malir	1 (2022)	35(est.)	37(est.)	18(est.)	5,828(est.)	4,082(est.)	17,137(est.)	105(est.)

3. METHODOLOGY

In order to evaluate flood-induced displacement and vulnerability in specific districts of coastal Sindh (Sujawal, Badin, Malir) and Southern Punjab (Multan, Bahawalpur, Dera Ghazi Khan) between 2014 and 2024, this study uses a quantitative method, secondary data-driven comparative case study strategy.

3.1 Research Design

The study is primarily quantitative, with a vulnerability indexing approach based on Brooks' (2003) equation for district-level comparisons and temporal trend analysis. Qualitative elements assess socioeconomic repercussions, displacement patterns, and resilience gaps based on official records and lived-reality descriptions in various authentic sources. The study triangulates several secondary sources for robustness, concentrating on decadal patterns and emphasising the 2022 floods' disproportionate importance in coastal Sindh (unusual "first major coastal exposure" with saltwater intrusion) versus recurring riverine flooding in Southern Punjab. This is not a primary longitudinal fieldwork research, but rather a retrospective examination of event-based and aggregated data, with 2022 giving essential context for slow-onset dangers (for example, salinity lasting after a flood).

3.2 Temporal Scope

This research covers the timespan from 2014 till 2030, projects the short-term trends in the context of flood frequency, flood-induced internal mobility, current and future vulnerability core of each district in long run. The analysis id based on event-driven data rather than a continuous tracking of each district. In the case of Punjab, it experienced multiple floods in years 2014, 2020, and 2022, while Sindh witnessed only a single calamity during this time period. Although this decadal framework has some limits such as overreliance on the data published by government and other credible stakeholders but it provides a clear snapshot for trend observation.

3.3 Data Sources and Methods of Collection

For this research, all the secondary data sources are consulted that include credible national and international resources, some of them are listed below:

1. Daily situation reports from 2014 till 2024 issued by PDMA/NDMA, IOM Pakistan, World Bank PNDA (2022), The Urban Unit reports issued by Government of Punjab and Sindh, UNHCR Pakistan reports and Ministry of Climate Change reports.
2. The reports published by The Pakistan Bureau of Statistics (PBS) after the 7th Population & Housing Census in 2023.

3.4 Analytical Approach for Calculating Vulnerability

For the assessment of Vulnerability, Brooks' equation and IPCC-aligned frameworks split it into three key components such as Exposure 40%, Sensitivity 40%, and Adaptive Capacity 20%) to indicate instant consequences in the low-resilience context. The role of each component is crucial in calculating the vulnerability of each district.

3.4.1 Exposure (40%)

It outlines the physical risk that a district encounters, for instance, the flooding, hurricanes, drought or any other abnormality. For measuring it the frequency and the intensity of disaster, its overall damage in the context of uprooting communities, crops or infrastructure loss are considered. Physical danger from climatic events, rated 1-10 (1 = little; 10 = extreme) according to flood frequency/intensity, displacement numbers, housing/crop/livestock losses, and infrastructure damage. Criteria: high scores for repeated/severe events (>500,000 displaced or substantial losses), moderate for 2-3 events with partial impacts, and low for rare/minor.

3.4.2 Sensitivity: 40%

Sensitivity assesses how vulnerable a district's population is to the effects of climate change, with an emphasis on economic reliance on vulnerable sectors (e.g., agriculture and fisheries), healthcare, and socioeconomic conditions. Districts that rely primarily on agriculture, livestock or fishing are more vulnerable rather than those rely on industries. Areas with high illiteracy or poor access to healthcare are more vulnerable and score higher, indicating a restricted ability to cope with and recover from climate-induced shocks. Population/systems' susceptibility, graded 1-10 (higher means greater vulnerability) based on economic reliance on climate-sensitive sectors (agriculture/fishing/livestock >60% livelihoods = high), low literacy/health access, and poverty/marginalisation. High scores indicate severe reliance and poor socioeconomics.

3.4.3 Adaptable Capacity (20%)

Adaptive capacity measures a district's potential to recover and adjust to climate change, considering characteristics such as literacy rates, infrastructural development, and economic diversity. Areas with greater literacy rates, better infrastructure (e.g., roads, healthcare, and early warning systems), and diverse revenue sources are better able to adapt to climate change. Districts with low literacy rates or poor infrastructure are less resilient and so have a higher vulnerability score.

The potential of every district to adjust or recover in the wake of particular climate related disaster, scales from 1 to 10. In this context lower score of each district highlights greater capacity to adjust or recover. Other criteria include the literacy rate that is marked in a way that lower score is graded as >65%, diversification in income generations, poor or upgraded infrastructure, access to early warning mechanism, etc. The higher score illustrates the limited capacity of a particular district.

The vulnerability score is ultimately determined by the weighted average of sensitivity score, exposure score and adaptive capacity scores. The contribution of exposure and sensitivity in the final score is 40% each while adaptive capacity makes a share of 20%. In order to make the comparison easier in each district the vulnerability score is graded by 10,000 for interpretable risk scores.

Vulnerability = (Exposure x Sensitivity) / Adaptive Capacity

3.5 Analytical Approach for Calculating Risk Score and Scaling

The risk of flood is measured on the basis of intensity of recent flood related disaster and the frequency of previous events. All those districts that have experienced frequent flooding in past with high frequency are graded a high-risk score.

Risk = Likelihood x Severity

3.6 Analytical Approach for Dynamic Vulnerability Projection

For forecasting the future vulnerability this research employs Dynamic Vulnerability equation on all districts. This model stated as follows: $V(t) = V_0 - \alpha \times t$ (with baseline V_0 2014 and t is representing the years). According to this equation the rat of change or adaptation (α) fluctuates with the frequency of floods, for instance, 0.015 is assigned to 3+ events, slower decline owing to repeated stress), 0.030 is assigned for 2 flood related events occurrences, and 0.040 is assigned to 1 event. The future vulnerability score projects a minimal progress in the context of resilience building in communities over the upcoming years in the absence of substantial external intervention. The key reason behind this progress is slow learning to cope up mechanism because of communities' experience to such calamities.

3.7 Ethical considerations

This research is based on secondary data, no direct interaction with affected population maintained. This study relies on the data collection and report published by government departments, independent NGOs, or INGOs report. The potential biases in this research could be underreporting in far flung areas or inconsistencies in official statistics.

3.8 Application of Methodology

The target districts of this research include of Multan, Bahalwapur and GD Khan in Southern Punjab while Badi, Malir and Sujawal in Coastal Sindh.

The vulnerability score of each district is calculate by using the Brook's equation and the recommendations proposed by IPCC. All the key three components, Exposure, Sensitivity, and Adaptive Capacity, are assigned scores on the scale of 1-10, 1 refers to very low while 10 shows very high. This scoring is applied on the consequences of floods data from year 2014 to 2024, all the key indicators such as the total displacements, socioeconomic profile of districts, Population census, literacy rates, the livestock or crops loss etc are considered for analysis. The weighted equation is listed below:

Vulnerability Score (V) = (Exposure × 0.40) + (Sensitivity × 0.40) + (Adaptive Capacity × 0.20)

In Brook's equation, sensitivity and exposure both are assigned 40% weightage because of this direct impact to risk while the adaptive capacity is marked 20% weightage because it is a mitigating factor. For calculating hazard score, the scores are assigned on the basis of frequency for instance, 1 incident = 3 points, 2 occurrences = 6 points, and 3 or more events = 9 points. For calculating the final risk score of each district, the risk core of each district is scaled by the factor of 10,000 for the interpretation of data in easier manner.

Risk Score = Likelihood x Severity x 10,000.

3.8.1 Calculating Hazard Scores

In order to calculate the hazard score flood frequency over the last decade (2014-2024) has been observed in all these districts. The hazard score rises in proportion to the number of flood events:

For example,

One flood incident equals **3 points**.

Two events equal **six points**.

Three or more equals **nine points**.

Table 2

District	Flood Events	Hazard Score
Multan	3	9
DG Khan	3	9

Bahawalpur	2	6
Badin	1	3
Sujawal	1	3
Malir	1	3

3.8.2 Calculation of Vulnerability Score

The following equation has been employed:

Vulnerability Score (V) = (Exposure × 0.40) + (Sensitivity × 0.40) + (Adaptive Capacity × 0.20)

3.8.3 Multan District

Key characteristics of Multan district:

Total no of floods experienced by Multan District = 3 (2014, 2016, 2022)

People affected = 163,638 (est.)

Houses damaged= Partial damaged 32,897 (approx.), Full damaged 28,765 (approx.)

Livestock lost = 6,987 (est.)

Crops damaged = 545, 980 (est.) Ha

Literacy rate = ~72% overall (77% male, 66% female).

Source of income = Agriculture accounts for around 50% of the economy, along with livestock.

3.8.4 Scores Assignment:

Hazard Score: 9 (3 flood incidents)

Exposure: 6 (Moderate - considerable influence but not the greatest among districts)

Sensitivity = 7 (Very High, due to agricultural dependency ~50%).

Adaptive Capacity = 5 (Moderate, due to substantially higher literacy than neighbouring districts).

3.8.5 Calculation:

Vulnerability Score = Exposure × 0.40 + Sensitivity × 0.40 + Adaptive Capacity × 0.20.

Vulnerability Score for Multan District = (Exposure × 0.40) + (Sensitivity × 0.40) + (Adaptive Capacity × 0.20)

= (6 × 0.40) + (7 × 0.40) + (5 × 0.20)

= 2.4 + 2.8 + 1.0

= 6.2

3.8.6 Dg Khan District

Key characteristics of DG Khan district:

Total no of floods experienced by DG Khan District = 3 (2014, 2015, 2022)

People affected = 692,670 (est.)

Houses damaged= Partial damaged 11,409 (approx.), Full damaged 13,275 (approx.)

Livestock lost = 11,341 (est.)

Crops damaged = 744,998 (est.) Ha

Literacy rate = 57.8% overall (66.2% male, 49.2% female)

Source of income = Agriculture accounts for around 60% of the economy, along with livestock, 81% rural population

3.8.7 Scores Assignment:

Hazard Score: 9 (3 flood incidents)

Exposure: 10 (Very High, due to massive relocation, poor housing conditions, and the rural aspect of the area)

Sensitivity = 10 (Very High, due agricultural dependency ~60%).

Adaptive Capacity = 7 (Low).

3.8.8 Calculation:

Vulnerability Score = Exposure × 0.40 + Sensitivity × 0.40 + Adaptive Capacity × 0.20.

Vulnerability Score for DG Khan District = (Exposure × 0.40) + (Sensitivity × 0.40) + (Adaptive Capacity × 0.20)

Vulnerability Score = (Exposure × 0.40) + (Sensitivity × 0.40) + (Adaptive Capacity × 0.20)

Vulnerability Score for Dera Ghazi Khan District = (10 × 0.40) + (10 × 0.40) + (7 × 0.20)

= 4.0 + 4.0 + 1.4

= 9.4

3.8.9 Bahawalpur District

Key characteristics of Bahawalpur district:

Total no of floods experienced by Bahawalpur District = 2(2014, 2020)

People affected = 167,690 (est.)

Houses damaged= Partial damaged 36,568 (approx.), Full damaged 6,000 (approx.)

Livestock lost = 5,476 (est.)

Crops damaged = 483, 678 (est.) Ha

Literacy rate = 64.4% (69.4% male, 59.1% female)

Source of income = Agriculture accounts for around 45% of the economy, along with livestock

3.9 Scores Assignment:

Hazard Score: 6 (2 flood incidents)

Exposure: 7 (High Exposure, due to massive relocation, poor housing conditions, and the rural aspect of the area)

Sensitivity = 9 (High Sensitivity, massive agricultural dependency).

Adaptive Capacity = 5 (Moderate, improved literacy).

3.9.1 Calculation:

Vulnerability Score = Exposure × 0.40 + Sensitivity × 0.40 + Adaptive Capacity × 0.20.

Vulnerability Score for Bahawalpur District = (Exposure × 0.40) + (Sensitivity × 0.40) + (Adaptive Capacity × 0.20)

Vulnerability Score = (Exposure × 0.40) + (Sensitivity × 0.40) + (Adaptive Capacity × 0.20)

Vulnerability Score for Bahawalpur District = (7 × 0.40) + (9 × 0.40) + (5 × 0.20)

= 2.8 + 3.6 + 1.0

= 7.4

3.9.2 BADIN DISTRICT

Key characteristics of Badin district:

Total no of floods experienced by Badin District = 1 (2022)

People affected = 17,137 (est.)

Houses damaged= Partial damaged 62,124 (approx.), Full damaged 49,125 (approx.)

Livestock lost = 23,433 (est.)

Crops damaged = 226, 044 (est.) Ha

Literacy rate = 47.65% (44.46% for men and 26% for women)

Source of income = Agriculture, forestry, and fishing account for roughly 66% of economy

3.9.3 Scores Assignment:

Hazard Score: 3 (1 flood incident)

Exposure: 9 (Vey High, due to massive housing destruction, livestock loss and the rural aspect of the area)

Sensitivity = 10 (Very High, due massive agricultural dependency on fishery, and forestry).

Adaptive Capacity = 8 (Very Low, very low literacy rate and rural character of district).

3.9.4 Calculation:

Vulnerability Score = Exposure × 0.40 + Sensitivity × 0.40 + Adaptive Capacity × 0.20.

Vulnerability Score for Badin District = (Exposure × 0.40) + (Sensitivity × 0.40) + (Adaptive Capacity × 0.20)

Vulnerability Score = (Exposure × 0.40) + (Sensitivity × 0.40) + (Adaptive Capacity × 0.20)

Vulnerability Score for Badin District = (9 × 0.40) + (10 × 0.40) + (8 × 0.20)

= 3.6 + 4.0 + 1.6

= 9.2

3.9.5 SUJAWAL DISTRICT

Key characteristics of Sujwal district:

Total no of floods experienced by Sujawal District = 1 (2022)

People affected = 154,000 (est.)

Houses damaged= Partial damaged 25,531 (approx.), Full damaged 26,168 (approx.)

Livestock lost = 7,677 (est.)

Crops damaged = 86,670 (est.) Ha

Literacy rate = 38.0% overall (male 33.70%, female 19.66%),

Source of income = Agriculture, fishing and livestock account for roughly 67% of economy

3.9.6 Scores Assignment:

Hazard Score: 3 (1 flood incident)

Exposure: 9 (Vey High, due to massive housing destruction, livestock and major crops loss)

Sensitivity = 10 (Very High, due massive agricultural dependency on fishery, and livestock).

Adaptive Capacity = 9 (Very Low, very low literacy rate and rural character of district).

3.9.7 Calculation:

Vulnerability Score = Exposure × 0.40 + Sensitivity × 0.40 + Adaptive Capacity × 0.20.

Vulnerability Score for Sujawal District = (Exposure × 0.40) + (Sensitivity × 0.40) + (Adaptive Capacity × 0.20)

Vulnerability Score = (Exposure × 0.40) + (Sensitivity × 0.40) + (Adaptive Capacity × 0.20)

Vulnerability Score for Sujawal District = (9 × 0.40) + (10 × 0.40) + (9 × 0.20)

= 3.6 + 4.0 + 1.8

= 9.4

3.9.8 Malir District

Key characteristics of Malir district:

Total no of floods experienced by Malir District = 1 (2022)

People affected = 17,137 (est.)

Houses damaged= Partial damaged 5,828 (approx.), Full damaged 4,082 (approx.)

Livestock lost = 5,828 (est.)

Crops damaged = 4,082 (est.) Ha

Literacy rate = 74% overall (male 78%, female 70%),

Source of income = Agriculture, fishing and livestock account for roughly 69% of economy

3.9.9 Scores Assignment:

Hazard Score: 3 (1 flood incident)

Exposure: 7 (Moderate, relatively lower displacement and damages)

Sensitivity = 10 (Very High, due massive depended on climate-sensitive sectors).

Adaptive Capacity = 4 (Higher, comparatively high literacy rate).

3.9.10 Calculation:

Vulnerability Score = Exposure × 0.40 + Sensitivity × 0.40 + Adaptive Capacity × 0.20.

Vulnerability Score for Malir District = (Exposure × 0.40) + (Sensitivity × 0.40) + (Adaptive Capacity × 0.20)

Vulnerability Score = (Exposure × 0.40) + (Sensitivity × 0.40) + (Adaptive Capacity × 0.20)

Vulnerability Score for Malir District = (7 × 0.40) + (10 × 0.40) + (4 × 0.20)

= 2.8 + 4.0 + 0.8

= 7.6

3.10 Vulnerability Index Table For Each District

Table 3

District	Hazard Score	Exposure	Sensitivity	Adaptive Capacity	Vulnerability Score
Multan	9	6	7	5	6.2
Dera Ghazi Khan	9	10	10	7	9.4
Bahawalpur	6	7	9	5	7.4
Badin	3	9	10	8	9.2
Sujawal	3	9	10	9	9.4
Malir	3	7	10	4	7.6

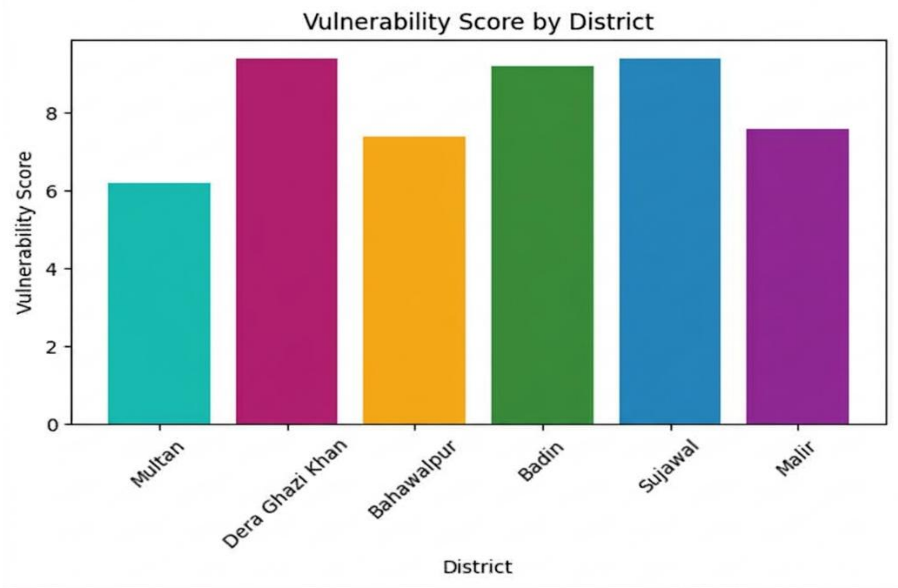

Figure 3

Districts such as **DG Khan, Badin, and Sujawal** are particularly **sensitive to climatic** threats. These districts have high Exposure and Sensitivity combined with poor Adaptive Capacity, resulting in high overall risk.

District with intermediate susceptibility include **Bahawalpu**r and **Malir.** While these districts exposure **and sensitivity are mild,** and their adaptive capacity contributes to a reduction in overall susceptibility.

Multan has **lower vulnerability** scores compared to others. While it has moderate exposure and sensitivity, its adaptive ability score helps to mitigate the risk.

3.10.1 Calculating Climate-Induced Migration Risk

The total Risk Score for each district was derived using the following formula:

Risk Score = Likelihood x Severity x 10,000.

In this study, Likelihood refers to the Hazard Score, which is derived by the frequency of flood events over the study period (2014-2024), with one event equalling three points, two events equalling six points, and three or more events equalling nine. Severity is represented by the composite Vulnerability Score, which is a weighted average of Exposure × 0.40, Sensitivity × 0.40, and Adaptive Capacity × 0.20.

To get more interpretable and comparable risk ratings across districts, a scaling factor of 10,000 was used. This extension of factor 10,000 allows a more clear snapshot of the climate induced displacement risk on vulnerable communities.

Risk Assessment Table for Each District

Table 4

District	Flood Events	Hazard Score	Exposure	Sensitivity	Adaptive Capacity	Vulnerability Score	Risk Score
Multan	3	9	6	7	5	6.2	**558,000**

Dera Ghazi Khan	3	9	10	10	7	9.4	**846,000**
Bahawalpur	3	9	7	9	5	7.4	**666,000**
Badin	1	3	9	10	8	9.2	**276,000**
Sujawal	1	3	9	10	9	9.4	**282,000**
Malir	1	3	7	10	4	7.6	**228,000**

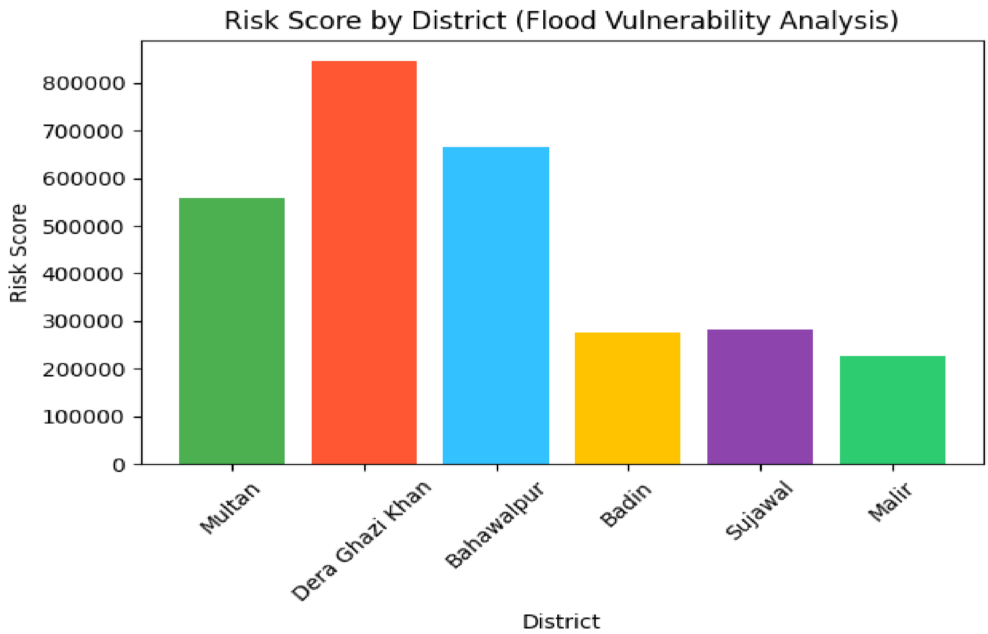

Figure 4

4. DISCUSSION

The vulnerability index and risk assessment index tables for each district (Table no 3 & 4) and the figure no 3 and 4 illustrates a distinct structural and regional pattern of flood-induced displacement in all six districts of Southern Punjab and Coastal belt of Sindh. The overall vulnerability score of all districts range 6.2 in Multan to a high of 9.4 in both districts Sujawal and DG Khan. However, the risk score of all districts shows small variations across districts, the highest score is assigned to DG khan (846,000) and the Malir is assigned to a lowest score (228,000). This pattern shows that vulnerability is not primarily linked only to frequent flooding but a range of other factors including extreme exposure, livelihood reliance on a particular sector, literacy rate, socio-economic outlook of a district, all contributes toward the final scoring of vulnerability. These interlinkages of multiple indicators satisfy Brook's equation that Vulnerability is the accumulation of exposure, sensitivity and adaptive capacity.

Another dominating trend that emerged during analysis is the key difference between the chronic and the acute flooding exposure across districts. Notable, between the time period of 2014 till 2024, the districts of Southern Punjab have experienced multiple floods, 2-3 in particular, that result in higher hazard scores in such districts. For instance, Multan, DG Khan and Bahawalpur districts, all are graded 9 score due to constant exposure and recurring flooding that ends up in socio-economic exhaustion. The analysis of DG Khan district projects that due to the experience of three massive floods in past, the district is more prone to exposure and sensitivity. The district's risk score is 846,000 because of maximum exposure and sensitivity scores that is 10 each.

Conversely, the districts of coastal areas of Sindh (Sujawal, Badin and Malir) experienced only one flood in the past from the year 2014 till 2024, The hazard score in theses districts is modest that is 3, however their vulnerability is extremely high. For instance, Sujawal and Badin districts are graded 9.4 and 9.2 vulnerability scores respectively. This indicates the pre-existing fragility that combined with the single natural catastrophe in 2022 and alter the entire patterns of livelihoods. Although the hazard score is modest but the highest vulnerabilities scores have the potential to produce near-equal vulnerability that is caused by frequent flooding.

The comparisons at district level reveals a clear link between vulnerability and scio-economic profile of each district. For instance, in the case of DG Khan, that is most vulnerable district has vulnerability score 9.4 while the risk score 846,000, the key reasons behind such scoring include 81% of its population resides in rural areas, almost 60% rely on agriculture and livestock for their subsistence, while the literacy rate is only limited to 57% with a female's literacy rate is about 49.2%. Additionally, Bahawalpur vulnerability score is 7.4 and risk score in 666,000, comparatively less to DG Khan. The key factors that contribute to this scorning include moderate literacy rate about 64.4%, while the dependency on agriculture is about 45%. Furthermore, Multan districts exhibit a comparatively better snapshot despite of experiencing 3 floods, as it vulnerability score is 6.2 and the risk score is 558,000, because of higher adaptive capacity with a literacy rate of about 72% and less intense exposure.

On the flip side, the situation in Sujawal, Badin and Malir is quite alarming. The vulnerability score of Sujawal is 9.4 and the risk score is 282,000. Although the risk score is minimal but the higher vulnerability is associated with the lowest literacy rate (38.0%, with female literacy at 19.66%) and a massive dependency on agriculture, fishing and livestock, almost 76%. The case of Badin district is similar to Sujawal, extensive reliance on agriculture and fishing almost 66% and lower literacy rate are contributing towards high vulnerability score that is 9.2. The case of Malir is somewhat exception, because of reasonable literacy rate (74%, female 70%) and partial urban setting. However, the districts dependency on climate-sensitive livelihoods make it vulnerable to climate induced disaster.

Another major trend that is emerging from these findings is the significant gender disparity. The female's literacy rate is significantly lower than males across all these districts, and this disparity is directly linked with lesser householder and community resilience. The affect of flooding on females' lives is disproportionate, following displacement they face multiple challenges, for instance, gender base violence, caring responsibilities, lack of access to basic necessities, issues related to their health, education loss etc. Moreover, this lower literacy rate contributes to limit their access to early warning system and livelihood diversification programs.

This study uses Dynamic Vulnerability Model, to predict how vulnerability might change over the next several years, which is defined as follows:

$\mathbf{V(t) = V_0 - \alpha \times t}$**,** where t is the number of years after 2024, V_0 is the baseline vulnerability score (calculated for the recent period, considered as 2024), α is the annual rate of change (adaptation rate), and V(t) is the anticipated vulnerability score at time t. The frequency of floods experienced between 2014 and 2024 is used to calibrate the rate of change (α):

Districts with three floods (high recurrence): $\alpha = 0.015$ (slowest reduction in sensitivity owing to recurrent stress)

Districts with two floods: $\alpha = 0.030$

Districts with only one flood in 2022: $\alpha = 0.040$

The Dynamic Vulnerability Model is designed to be exploratory and illustrative, with α values based on real-world adaption rates rather than statistical regression. Flood-prone districts experience slower recovery, resulting in a smaller α (vulnerability reduces gradually). Districts with a single major flood experience faster recovery, resulting in a larger α (vulnerability falls faster).

This explains why the scale is:

Three floods result in $\alpha = 0.015$ (slowest drop).

Two floods result in $\alpha = 0.030$ (moderate deterioration).

1 flood → $\alpha = 0.040$ (fastest decline).

Calculation of V(t) for a Sujawal district as a case in point:

Sujawal = (1 flood, $V_0 = 9.4$, $\alpha = 0.040$)

Baseline vulnerability (V_0) = 9.4 (the 2024 score from the Vulnerability Index Table) α (annual rate of change) = 0.040 (due to only one flood) t = years after 2024

$V(t) = V_0 - \alpha \times t$.

For 2025: t = 1 V(2025) = 9.4 - (0.040 x 1) = 9.36.

For 2026, t = 2. V(2026) = 9.4 - (0.040 × 2) = 9.32.

For 2027, t = 3. V(2027) = 9.4 - (0.040 x 3) = 9.28.

For 2028, t = 4. V(2028) = 9.4 - (0.040 × 4) = 9.24.

For 2029, t = 5. V(2029) = 9.4 - (0.040 × 5) = 9.20.

For 2030, t = 6. V(2030) = 9.4 - (0.040 x 6) = 9.16.

Despite having the maximum feasible adaptation rate (α = 0.040), Sujawal's vulnerability is only reduced from 9.4 to 9.16 by 2030. This demonstrates how a single catastrophic event, such as the 2022 flood, can leave a long-lasting mark when adaptive capacity is extremely low.

The model projects that vulnerability will gradually reduce because of learning effects that communities will learn after their encounter with floods, insignificant adaptations strategies and a natural recovery in the absence of any significant interventions. The projections cover the timeframe till 2030 (t=6)

Future Vulnerability Projection for Each District

Table 5

District	Floods	α	V_0 (2024)	V(2025)	V(2026)	V(2027)	V(2028)	V(2029)	V(2030)
Multan	3	0.015	6.2	6.185	6.170	6.155	6.140	6.125	**6.110**
DG Khan	3	0.015	9.4	9.385	9.370	9.355	9.340	9.325	**9.310**
Bahawalpur	3	0.015	7.4	7.385	7.370	7.355	7.340	7.325	**7.310**
Badin	1	0.040	9.2	9.160	9.120	9.080	9.040	9.000	**8.960**
Sujawal	1	0.040	9.4	9.360	9.320	9.280	9.240	9.200	**9.160**
Malir	1	0.040	7.6	7.560	7.520	7.480	7.440	7.400	**7.360**
Badin	1	0.040	9.2	9.160	9.120	9.080	9.040	9.000	**8.960**
Sujawal	1	0.040	9.4	9.360	9.320	9.280	9.240	9.200	**9.160**
Malir	1	0.040	7.6	7.560	7.520	7.480	7.440	7.400	**7.360**

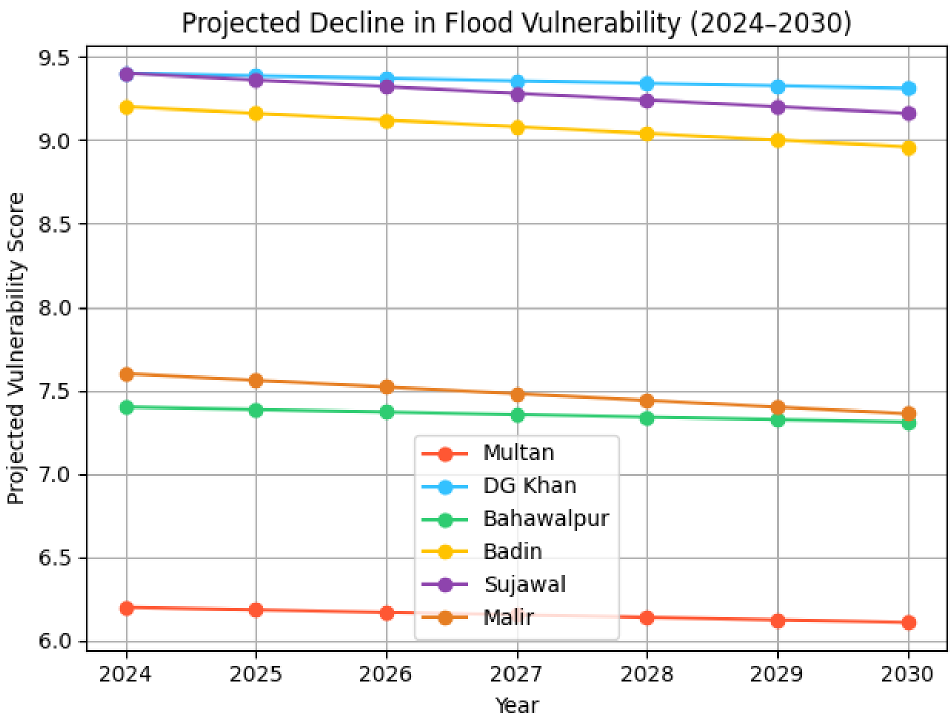

Figure 5

The graph indicates two key trends. All the districts with recurring flooding for instance, Bahawalpur, DG Khan and Multan illustrate only a little improvement in the risk score by the year 2030 due to the low α value (0.015). In the case of DG Khan, despite of its positioning as a most vulnerable region, improves only from 9.4 to 9.31. This trend shows with any significant external measure frequent flooding in these regions will continue to compromise the resilience development among communities. Conversely, the trend in the coastal district of Sindh (Badin, Sujawal and Malir) indicate a faster reduction in the vulnerability score of each district because of higher adaptation rate (α = 0.040). Evidently, the trend shows that Sujawal (9.16) and Badin (8.96) even by year 2030, will be ranked as more vulnerable districts.

The trends show in the graph are based on liner model without taking into account the other independent variables, for instance, new government initiatives, any external major investment for upgrading the socio-economic profile of district or potential change in the weather conditions etc. For the future, the actual outcomes could be better in case effective adaption measured employed in that particular districts and could be even worse with lack of adaptation and repeated flooding. Nevertheless, this model presents a clear picture that all the districts that have high vulnerability score and minimal adaptive capacity are more vulnerable than those districts that have comparatively better adaptive capacity and they would employ a sustained resilience-building strategy at grass-root level.

5. CONCLUSION

The patterns of climate-induced flood displacement and future vulnerability in six highly exposed areas of coastal Sindh and Southern Punjab between 2014 and 2030 have been methodically investigated in this study. Using a quantitative comparative analysis based on Brooks' (2003) vulnerability framework, the study shows that although flooding is a natural hazard, human factors, such as high exposure, extremely sensitive local economies, and critically low adaptive capacity are primarily responsible for the extent of human displacement and livelihood destruction.

Districts like Dera Ghazi Khan and Sujawal have the highest levels of risk, according to the vulnerability and risk assessments, with vulnerability ratings of 9.4 apiece. These results indicate that whereas the single but devastating 2022 flood in coastal Sindh had acute, long-lasting effects through saltwater intrusion and livelihood collapse, frequent riverine flooding in Southern Punjab causes chronic stress. The study unequivocally demonstrates that a significant number of environmental IDPs, individuals and households compelled to relocate owing to abrupt or gradual environmental degradation rather than conflict, are being created in Pakistan as a result of climate-induced displacement. Trapped in cycles of short-term relocation, asset loss, and worsening poverty, these environmental IDPs are still mainly unseen in national policy frameworks.

This study's findings highlight that vulnerability is a dynamic state. **Malir** and **Multan,** two districts with significantly stronger infrastructure and greater literacy rates, have lower vulnerability scores. This implies that focused investments in early warning systems, resilient infrastructure, education, and livelihood diversification can significantly lower the chances of future relocation. However, in the absence of such initiatives, Pakistan would continue to see an increase in the number of environmental IDPs due to the combination of expanding climate dangers and enduring socioeconomic deficits.

The current position of Pakistan is very challenging in the wake of climate change, country is left with very limited options, only two in particular, either to make long term efforts or to adopt short term reactive strategies. The repeated loss in every flood is a testament that the short-term strategy is inadequate and the country need to consider comprehensive long-term approach to minimize the impact of climate related disasters. The long-term strategy encompasses effective governance at local level, with a special focus on vulnerable groups, especially women and children, including climate-induced mobility as a key priority into local, provincial and national level disaster management strategies.

This study makes a particular attention that effective policies in the context of climate change cannot be reactionary. If the nation is to shield its citizens from the growing risks of migration and displacement brought on by climate change, it must address the structural drivers of vulnerability found in this study. Pakistan can only lower the human cost of future floods and protect the livelihoods and dignity of its most vulnerable residents via persistent, district-specific, and people-centered resilience building.

5.1. Future Recommendations

For minimizing the sufferings of our communities, Pakistan must immediately adopt a comprehensive, evidence-based, and proactive strategy that comprehends the voices of affected population. Few approaches listed below could be effective in this regard:

5.1. An Early Warning and Preparedness Systems at Local Level

a. Disseminated warnings in regional and local languages via public radio, SMS, and local mosques and streamers.
b. Form community-based disaster preparedness committees with training to evacuate and assist during calamities.
c. Use GIS technology to map flood-prone areas and integrate disaster planning at the district level.

5.2. Invest in Human Capital and Awareness

a. Promoted climate awareness through literacy initiatives for women and youth in rural areas.
b. Add disaster preparedness to school curricula in susceptible districts.
c. Develop awareness programs to clarify define climate induced migration and promote flood readiness, income diversification, and sustainable land use.

5.3. Livelihood Diversification and Economic Resilience

a. Offer microfinance for flood-resilient livelihoods, such as poultry, handicrafts, and small-scale manufacturing.
b. Encourage climate-resilient crops and sustainable farming practices in Southern Punjab.
c. Encourage coastal aquaculture, inland fisheries, and salt-tolerant farming methods.

5.4 Infrastructure for protection and relocation.

a. Construct raised housing and flood-resistant structures in high-risk areas with local materials and labour.
b. Build and maintain protection embankments, check dams, and canals for riverine and coastal zones.
c. Plan relocation and settlement strategies for communities living in floodplains or eroding coastal strips.

5.5. Social Protection and Safety Nets

a. Create climate-linked insurance systems for small farmers and fishermen.
b. Prioritise climate-affected families in the state-run welfare programs
c. Offer post-disaster cash assistance, food security support, and mental health services to displaced families.

5.6. Data-Driven Governance: Policy Integration

a. Create district-level climate vulnerability profiles that are updated annually.
b. Build flood resilience into local development plans and provincial finances.
c. Coordinate with PDMA, NDMA, and local governments to prioritise gender-sensitive and inclusive planning.

Finally, resilience is not a luxury; it is a right. Resilience must no longer be viewed as a luxury offered after a disaster, it must be recognised as a right for all citizens, particularly those living on the fringes. This study advocates for a new social contract in which the state does not abandon its most vulnerable citizens to the mercy of nature, but instead stands with them as a guarantee of safety, dignity, and hope. Pakistan's resilience will be tested every year during flooding, but the key question is whether we will be able to build resilience within our communities and strengthen our preparedness, or whether we will continue to fail our people and suffer heavy losses each monsoon season.

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