

Housing Market Pressures from Climate Migration: A Study of Informal Settlements in Urban Pakistan

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Abstract

The Global South has been witnessing a rapid urban sprawl for over two decades, a demographic shift which has greatly worsened the housing market pressures in these developing nations. In Pakistan, as the demand immensely outweighs the supply of affordable housing in urban districts, Informal Subdivisions of Government Land (ISDs or *katchi abadis*) and Informal Subdivisions of Agricultural Land (ISALs or slums) have proliferated on the outskirts of every major city in the country. Compounded with the issue of extreme climatic changes in the region, which have created a ripple effect, escalating rural-to-urban internal migration at an alarming level, an unprecedented crunch on the housing market has been formed due a demand shock. To this date, the housing crisis stands largely unmonitored and under-documented on part of the appropriate government authorities. With the lack of suitable, efficient and implementable policy frameworks to cater to the growing housing crisis, and the multitude of socio-economic dilemmas created by this shortage as a result, there is a pressing need in popular discourse to investigate the effects of climate-induced internal migration on Pakistan's peri-urban centers against the backdrop of a burgeoning population it is ill- equipped to cater to. The study adopts a maximalist approach towards climate change and its adverse effects on the disenfranchised community of rural Pakistan, and considers climate-induced migration typology to be the primary reason for the escalated resettlements in recent times, causing a population explosion in the urban and peri-urban areas, including ISALs and ISDs. The following study sets to investigate and highlight the multifaceted aspects of housing market pressures in Pakistan's urban and peri-urban milieu, which are continuously worsening with the increasing migration from rural areas. Furthermore, this paper attempts to contribute to the existing discourse by identifying the gaps in the current economic policy frameworks with regards to climate-induced expansions of informal settlements.

Keywords: climate change, internal migration, housing crisis, peri-urban centers, urbanization, slums, *katchi abadis*, Pakistan, rural-to-urban, urban sprawl, housing market pressures, climate-induced migration, ISDs, ISALs.

Adverse Effects of Climate Change, according to the United Nations Framework Convention on Climate Change (UNFCCC), is understood as “changes in the physical environment or biota resulting from climate change which have significant deleterious effects on the composition, resilience or productivity of natural and managed ecosystems or on the operation of socio-economic systems or on human health and welfare.”

Affordable Housing, with reference to this paper, is categorized to be those housing units that are “reasonably priced across all income segments, from lower and moderate-income households to high-income groups. Housing is generally considered affordable if it costs no more than 30% of a household's gross income, including rent or mortgage payments and essential utilities.” (HBFC 4) If the household income for other necessities calculates to be less than 70%, then the housing can no longer be considered ‘affordable’ for that family.

Climate Change, as defined by the UNFCCC, means “a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods.”

Climate Induced Migration, for the purpose of this study, is an umbrella term for movement, whether temporary or permanent, of people from their place of residence due to climate change, whether resulting in sudden, or slow impacts.

Housing Crisis, where mentioned in this paper, means the stark difference between the high demand and low supply of affordable housing units in urban areas, which ultimately leads to expansion of informal settlements in peri-urban areas.

Informal Subdivision of Agricultural Land (ISALs or slums), for the purposes of this paper, is a heavily populated residential area erected on agricultural lands on the outskirts of cities, with substandard housing, squalor, and limited basic necessities (UN-Habitat 2003) but with a degree of security (Hasan and Arif).

Informal Subdivision of Government Land (ISDs or *Katchi Abadis*) are, for the purposes of this paper, the largely unauthorized residential encroachments on state land (Hasan and Arif), riddled with inadequate and inferior living conditions, with a lack of security and basic necessities.

Internally Displaced Persons, also termed as IDPs, are persons or groups of persons, as per the Guiding Principles of Internal Displacement, “who have been forced or obliged to flee or to leave their homes or places of habitual residence, in particular as a result of or in order to avoid the effects of armed conflict, situations of generalized violence, violations of human rights or natural or human-made disasters, and who have not crossed an internationally recognized State border.” (UNHCR)

Urban Sprawl, is understood to be “the formation of extensive and infinite borders of metropolitan areas” (Mujahid and Begum) and “a type of land use in an urban area that has low levels of density, continuity, concentration, clustering, centrality, nuclearity, mixed-use and proximity.” (Maier et al)

1. INTRODUCTION

Various push and pull factors have long influenced human migration, which now stands further exacerbated due to the rapidly increasing climatic changes and the ensuing catastrophes. Recent studies have determined that climate-induced internal migrations aggravate other standard typologies of migration (Salik et al. 4) and with the oft occurring calamities, such as flash floods, storms, cloud bursts, droughts and heat waves, migration patterns over the last decade have shifted significantly. Pakistan is amongst the nations most gravely affected by climate change (UN Habitat 2023). The 2022 floods alone damaged almost 2 million settlements, and affected nearly 33 million people (UNOCHA). The monsoon season of each year now brings with it a new spell of destruction. Such catastrophes do not merely bring harm in the form of death, loss of livelihood and damage to infrastructure, they also push millions into poverty, displacing them from their homes. This displacement inevitably converts into migration towards urban centers in search for better and safer lives. A study by the World Bank Group and Asian Development

Bank (Climate Risk Country Profile: Pakistan) suggests that due to slow-onset climate changes, by 2050 up to 36 million people in South Asia will be categorized as internal migrants, a number which will magnify exceedingly beyond 2050 if substantial climate mitigation actions are not adopted.

In a 2019 report 'Climate impacts and migration in Pakistan' by the International Institute for Sustainable Development (IISD) has observed that adverse effects of climate change, such as droughts and flash floods, have greatly lessened crop yields and increased costs of production for Pakistan's farming population, which has resulted in a loss of income in the long run, forcing the agricultural community to turn towards urban centers for alternative means of livelihood. This results in a greater strain on urban resources, which are not equipped to deal with the sheer influx of people it is receiving on an annual basis. Pakistan now stands as the most urbanized nation in South Asia (National Report of Pakistan For Habitat III), and the arrival of climate-induced migrants further increases its percentage population in urban districts, as compared to the rural areas. This population explosion and rise in housing demand in the major cities of the country is leading to unplanned and unassessed urban sprawling, where the migrants and lower income groups are ultimately forced to dwell in the outskirts of the cities on account of their lower financial standing. As internal migration, which in the most recent years has been primarily induced by climatic catastrophes, forces majorly lower and lower-middle class families to migrate from rural to urban centers, the limited housing units in urban centers preclude affordability due to the sharp demand shocks. Most migrants therefore have no option but to reside in slums and *katchi abadis* in deplorable conditions. Currently, an estimated 78 million population is residing in urban and peri-urban areas of Pakistan, and growing further at a 3.65% annual rate (Climate Risk Country Profile: Pakistan). These statistics, along with the available housing units in the larger cities of the country, foreshadow an even dire housing market imbalance, further rent escalations, land price explosions, and eventually, even worse socio-economic conditions of the *katchi abadi* and slum dwellers.

As a developing nation, the factors which contribute towards a healthy economic growth of the country include a well-functioning housing market, which at the present is performing inadequately in Pakistan. Planned and sustainable urbanization, with satisfactory infrastructure and amenities, is the key to reduce poverty in the region and increasing economic growth. Meanwhile, unplanned and unsustainable extensions and sprawls inevitably contribute further towards climate change due to unchecked emissions and the cycle of climate change-induced migration continues, creating further obstacles in the housing crisis. Amongst other obstacles and impediments which are reducing housing market performance in Pakistan's urban centers are disproportionate public land possession, insufficient infrastructure amenities, ineffectual rights of property and ownership, persistent rent seeking, inefficient urban housing planning regulations, overpriced zoning, plot division and construction by-laws, restricted funding for property development, underperforming property tax collection mechanisms and rent control (Dowall and Ellis). It is therefore of utmost importance for Pakistan's economic growth and stability that a comprehensive policy reform is introduced in the housing sector in order to improve the market conditions.

The following paper, which sets to become part of the principle literature on the matter, will therefore, study in detail the consequences of climate-induced migration, from rural to peri-urban centers of Pakistan, on the already saturated housing market of the country. The first part of the paper will provide a detailed overview of the country's profile during the last three decades, including Pakistan's population profile, its climate change profile and its migration profile, by employing graphs and charts to efficiently convey the data. The second part of the paper will highlight the ground realities of housing deficiencies in urban and peri-urban areas of the country, the demand-supply gap of housing, highlight the effects of urban crowding

due to climate-induced migration on informal settlements in the cities. The case study on Lahore's informal settlements will also be presented to further elaborate the housing market crisis. The paper will then provide an analysis of the existing housing policies in Pakistan from a resilience lens and the deficiencies that cause that continue to make the cities non-resilient. Lastly, the paper will offer recommendations which are deemed essential for overcoming the housing market crisis and for providing the citizens of Pakistan with the basic rights they are guaranteed by law.

1.1. Significance of the Research

In Pakistan, as climate change has become, now more so than ever before, a grave threat to human life, it can no longer be considered a distant problem which might arise in the future, as is considered to be the case by the minimalist approach towards adverse effects of climate change (Durrani 29). The minimalist approach towards climate migration puts greater importance on economic, social, natural and cultural factors for rural to urban migration, with limited credence to the climatic typology. This take can no longer be maintained as the adverse effects of climate change, and their consequential disasters, are already being suffered by millions in this country, as well as globally. What is evident is the failure of existing economic policies and national frameworks of Pakistan to adequately address the aftermath of such climatic catastrophes and the relationship it shares with human mobility. The significance of this research, therefore, is to shed direct light on the complications created by climate-induced migration owing to overpopulation in under-resourced urban areas, by synthesizing available data from pre-existing literature. The study is also significant as it provides evaluations and recommendations, in an attempt to initiate a comprehensive framework-building process, in order to improve the socio-economic conditions of the migrants residing in informal settlements, whether on government or agricultural lands, so that they may enjoy the very basic rights to life that every citizen of this country legally enjoys.

1.2. Scope of the Study

This paper will analyze the rural-to-urban migration patterns of both long-term and short-term adverse effects of climate change and crises. Therefore, the scope of this paper includes permanent movements of people due to heat waves and droughts, and the consequent loss of agriculture and livestock, as well as temporary relocations due to flash floods, unprecedented heavy rainfalls and cloud bursts, resulting in loss of property and livelihood. Data trends highlighted in this study are included from the past three decades, i.e. 1990s-2000, 2000s-2010, and 2010-2020s. With regards to analyses and critiques of the policy frameworks, the paper will analyze the housing market crisis and the ensuing challenges due to climate migration through a resilience lens. Urban resilience planning through national and international regulations will be examined, taking into consideration their strengths and weaknesses, adaptability and promoting sustainable strategies. As for the scope of internal migration figures examined in this study, the data will reflect the overall numbers of internal migration rather than strictly climate-induced migration statistics, the reasoning for which is explained in the following part of the paper.

1.3. Limitations to the Study

Despite the figures available on rural to urban and peri-urban (ISALs and ISDs) migrations, and the projected increase in its percentage, which supplement the housing crunch in the larger cities of the country, the current study faces several impediments, primarily with regards to the available statistics. A major challenge towards conducting a proper and thorough investigations is the lack of comprehensive data which reflects the true picture of urbanization in Pakistan. Despite the daunting figures and the rising percentage of population in city centers and its outskirts, the figures still do not reflect the reality. Majority of the studies on migration patterns of the country are based on statistics provided by the census, which

itself is a miscalculation the true number of migrants in Pakistan's cities. (UN Habitat, 2023). In defining urban and rural areas, the census used administrative boundaries of the cities, not taking into consideration the ever-extending slums and Katchi abadis areas, resulting in a reduced urban population percentage. "The unaccounted-for and hidden urbanization has impeded thorough analysis of the associated issues and due consideration of the opportunities arising from urbanization" (Pakistan National Urban Assessment). For the purposes of proper studies, readjustments to the figures are required by the government through proper identification of slums and katchi abadi boundaries.

Another primary obstacle to this investigation is the sheer dearth of adequate figures on the internal migrations based solely on climatic-induced problems. "While a substantial proportion of the population in developing countries live in rural areas, it remains largely unknown how many rural people migrate internally to urban and peri-urban centers in response to climate change" (Saeed et al. 9). The present data amalgamates various drivers for rural population to move to city centers, and majority research on internal migration caters to economic push and pull factors (Salik et al. 56) or disregard climatic effects as a substantial factor, relying on "natural change, social change, commercial change, and economic change" (Rahman et al. 480) as the primary drivers. The lack of reliable statistics which solely highlight climate-induced internal migrations makes it difficult to establish migration patterns (Black et al., 2011), making uncertain their true impact and make further complex the "heterogeneity of individual and collective responses to climate change." It is this scarcity of correct empirical evidence which has left the discourse on climate-induced migration largely speculative, and it is fated to remain so till appropriate data-collection measures are taken by the country.

1.4 Literature Review

Abdul and Yu, in 'Resilient urbanization: A systematic review on urban discourse in Pakistan', identified climate change as one of the major urban challenges faced in Pakistan, along with unregulated urbanization, housing shortage, diminished social capital, inadequate spatial planning, in-effective building by-laws and urban water scarcity. It also explores urban resilience planning, comparing policies and models adopted by Pakistan with those which have been suggested and implemented in the west. It highlights the shortcomings of the urban discourse in Pakistan, which does not focus on, nor calls for sustainable development, disaster risk management, resilience models and strengthening institutions.

Naeem and Aslam, in 'Urban Climate Resilience and Development in Pakistan', assess urban national policies and interventions with regards to development, assessing the policies and interventions related to urban development and urban resilience in Pakistan in accordance with national and international objectives. It highlights critical gaps within the development as well as within the policies. It identifies socio-economic problems in informal settlements, such as the heat island effect, water scarcity, health and sanitation, air quality, waste management, urban mobility and energy usage. It also discusses institutional and governance challenges and incapacity to adequately deal with these problems.

Salik et al., in 'Climate-Induced Displacement and Migration in Pakistan', focus on the ground realities of climate-induced migration and displacement, discussing in detail its drivers and impacts. It reviews Pakistan's institutional response with regards to climate change and disaster management, deliberating the policy responses of climate migration typology. It lists the major impacts of climate-induced migration found from the study, which used a participatory research methodology, and though it concludes that, though the overall economic conditions of the migrating families improve in the urban districts, a plethora of other issues arise for these lower income and marginalized communities in their new colonies.

Sindhu, in 'The Concept of Affordability and the Affordable Housing in Pakistan', explores the concept of affordability and the housing crisis in Pakistan, primarily for the lower-economic strata entrenched in socio-spatial disparities. It analyses housing affordability through the Multi-Criteria Decision-Making (MCDM) methodology for sustainable urbanization. It also highlights economic and policy challenges with regards to the informal settlements and calls for land reforms, financial reforms, community building and green buildings.

Hashmi, in 'Climate Change and Climate Induced Migration in Pakistan: A Threat to Human Security', provides the necessary data on temporary and permanent climate-induced migrations in Pakistan, adopting a quantitative methodology to understand the factors behind internal migration through surveys and questionnaires.

Hasan and Arif, in 'Pakistan: The Causes and Repercussions of the Housing Crisis', analyze Pakistan's current housing policy, highlighting the socio-economic concerns prevalent in slums, *katchi abadis* and townships, and the continuous densification of these areas. It calls for provision of affordable credit, establishing criteria for new housing projects, setting housing standards, suppressing land speculation, legislating for land acquisition and regularizing informal housing.

Peerzado et al., in 'Land use conflicts and urban sprawl: Conversion of agriculture lands into urbanization in Hyderabad, Pakistan', explored the conversion of agricultural land into urban settlements owing to urban sprawl, which, if allowed to continue would result in many cultural, economic, social and environmental issues. It concludes that the lost agricultural land would ultimately lead to landlessness, joblessness, a food scarcity and an increase in agricultural product prices and import bills.

Mujahid and Begum, in 'An Analysis of Urban Sprawl in Pakistan: Causes, Consequences, and Policies Analysis. Pakistan Institute of Development Economics', conduct a systematic literature review on Pakistan's urban sprawl and unplanned urbanization, their causes, consequences and related policies and frameworks. It evaluates and integrates a major part of the available discourse on the matter and presents the findings in a concise manner.

Durrani, in 'Climate Induced Migration in Pakistan: Global Discourse, Local Realities and Governance', adopts a mixed-method approach in analyzing primary and secondary sources to understand the true severity of climate-change effects on mobility. The study compares the minimalist and maximalist perspectives towards climate-induced migration, and assesses these academic theoretical frameworks against the ground realities of people from far-flung remote areas of the country.

Ahmad et al, in 'An Analysis of Urban Sprawl in Pakistan: Consequences, Challenges, and The Way Forward', conducts an in-depth literature review on urban sprawl in Pakistan from an economic perspective, and lists the major consequences of peri-urban expansions due to internal migration. It also provides insight on the effects of urban sprawl on agricultural lands and the economic outcomes of their depletion.

Rahman et al, in 'Urbanization and Housing Crisis in Pakistan: Challenges and Policy Responses', investigates the housing crises and challenges in Pakistan caused by an urbanization explosion. The study aims primarily on the availability, affordability and lacking amenities of informal settlements, as well as the socio-economic consequences of inadequate housing. It highlights the factors contributing to the housing crisis and the policy response by the government. It recommends, amongst other global best practices, a public-private partnership to effectively resolve the issues.

2. PAKISTAN'S COUNTRY PROFILE

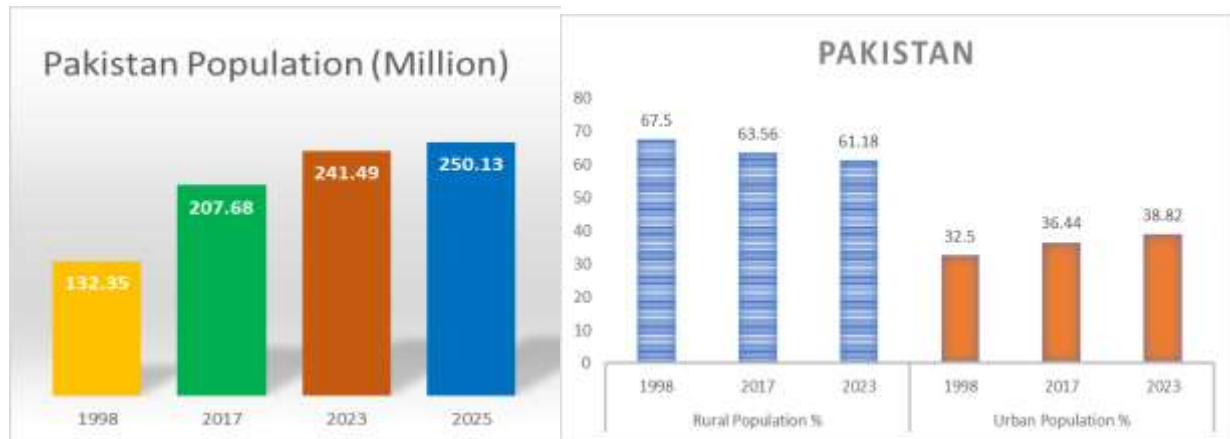
The Islamic Republic of Pakistan is located in South Asia, with the Karakorum, Himalayas and Hindukush mountain ranges in its north and the Arabian sea in the south. Amongst its neighbors are Iran in the west, Afghanistan in north-west, China in the north and India in the east. The country covers an area of 796,095 km², with a diverse topography, including some of the world's highest mountains, vast glaciers and plateaus in the north, fertile Indus river plains in the mid-lands, and arid lands and deserts in the southern and western locations.

With a Human Development Index (HDI) of 0.54, Pakistan currently stands at the lesser end of the medium development category (164th out of 193 nations), and according to the Global Multidimensional Poverty Report, 2024 by UNDP, 38.8% of the Pakistani population (93 million) live in multidimensional poverty. Pakistan has a heavy reliance on agriculture, which contributes to around 23% of its Gross Domestic Product (GDP), accounts for up to 80% of its exports, and employs around 42% of the population as its labor force, according to the Punjab Agricultural Department. An estimated 70% of the population is either directly or indirectly involved in agricultural practices in the country. Pakistan contributes less than 1% of global Greenhouse Gas (GHG) Emissions (Naeem and Aslam 16), but is categorized amongst the most climate-vulnerable nations in the world. In the last decade, Pakistan's agriculture economy has faced substantial variations in crop yields, with an estimated 33% variability in rice yields, almost 30% in wheat, and around 39% in maize (Ali et al. 2017), with the production expected to decline sufficiently by 2080 due to climate changes (Arif et al 8). These economic losses, a result of climate change, push farming families towards the cities in search of better prospects, and in their need of housing, agricultural lands are converted into informal settlements to house these families. These diminishing agricultural lands will ultimately create an economic crisis for a country which is so heavily reliant on agricultural products (Peerzado 428). Hence the demographic shift which Pakistan is facing in the form of internal migrations due to adverse effects of climate change not only demonstrates a housing crisis, but an ultimate crash of the country's entire market system.

2.1 Pakistan's Demographic Profile

The Pakistan Bureau of Statistics published in its 2023 Census result that the total population of Pakistan was an estimated 241.49 million, which is considered to have surpassed 250 million in 2025, making it the 5th most populous nation in the world. The current population growth rate, according to the World Bank Data, is 2.55%, which is exponentially greater than that of the other populous countries in the region, such as China, with a -0.1% growth rate, and India with a 0.9% growth rate. This population explosion in Pakistan, and the increase in number of households, which is suggested to be approximately 6.5 persons per household (2023 Census), and the steady rise in urbanization, has created a dearth of affordable housing in the Pakistan's megacities.

As depicted in the tables A and B below, of the 132 million people in 1998, 67.5% were part of the rural population, with around 43 million people residing in the urban areas. In 2017, out of the 207.68 million people, 63.56% were part of the rural population, and 75.6 million people were part of the urban centers. This number has increased, in 2025, to approximately 97 million people in the cities, which are now choked, with an estimated urban housing deficit of 4 million units (Khan). As the influx of migrants continues to turn towards the cities, affordable housing becomes a greater challenge due to the exponential rise in residential demands and the inelasticity of its supply in the short run. This leads to the higher income households with financial power to afford better housing to push the lower income classes to the outskirts of the cities, forcing them to reside in ISALs and ISDs.



Tables A

Table B

Tables generated from the result of 7th population census, 2023.

Source: <https://www.pbs.gov.pk/sites/default/files/population/2023/Press%20Release.pdf>

2.2 Pakistan's Climate Profile

Similar to its topography, Pakistan's climate is also extremely diverse, owing to the vastly different terrains in its southern and northern areas. The southern regions of the country, all the way to the shore line, are hot and arid due to high temperatures, which easily rise above 45°C in the scorching summer months (Aslam et al). These regions experience lesser precipitation, and a lower annual rainfall of up to 125mm, which causes severe droughts and heat waves (Khan and Hasan). The northern regions of Himalayas and Karakorum are severely cold, where the temperature easily falls below -15°C in the winters, and higher precipitation and greater rainfalls, of up to 1000mm annually are experienced (Khan and Hasan). Table C below shows the average low, mean, and high surface air temperatures and precipitation throughout the year in Pakistan, recorded from 1991-2020. The monsoon months of June, July and August experience highest temperatures and precipitation, as evident from the table, and it is in these months the country is at the greatest risk of heat waves and floods.

In the 2020 Global Climate Risk Index, Pakistan ranked as the fifth most vulnerable nation, with an average 0.57°C increase in temperature in the 20th century. This rise in average temperature has resulted in glacial ice melting in the northern regions, which adds to the water from high rainfall, creating flash floods. "High and rising temperatures, increased intensity and frequency of weather-related disasters and events, melting of the glaciers in the North, especially the Himalayan glaciers, alongside the increased variability of monsoon rains, are but a few of the high degree impacts facing the country" (Durrani 20). Table D below shows the increase in average mean seasonal temperature experienced in Pakistan over the past century. The average mean temperature in 1901-1930 was 10.17°C in Dec-Jan-Feb and 21.83°C in Mar-Apr-May, whereas it was recorded at 11.27°C and 22.93°C respectively from 1991-2020. In Jun-Jul-Aug of 1901-1930 the recorded mean temperature was 29.35°C and in Sep-Oct-Nov it was 20.97°C, whereas it was 29.55°C and 21.83°C respectively from 1991-2020.

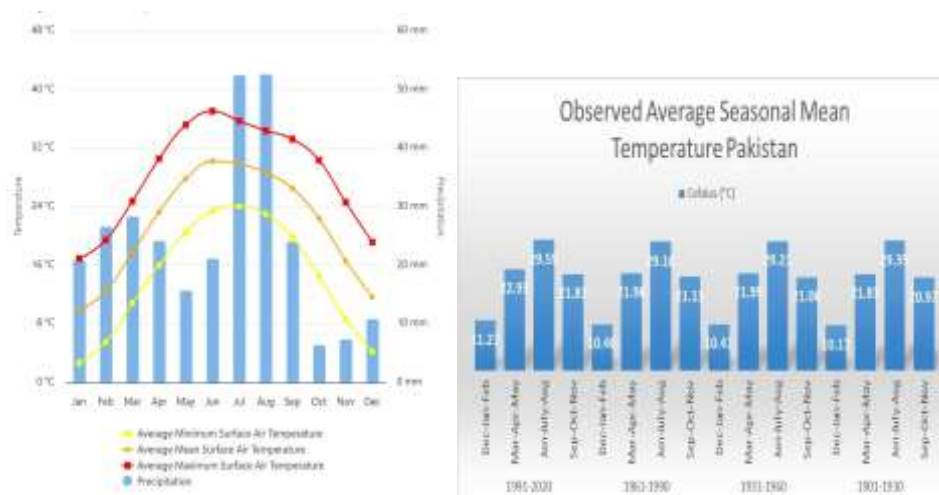


Table C: Average Surface Air Temperatures and Precipitation for years 1991-2020,

Source: <https://climateknowledgeportal.worldbank.org/country/pakistan/climate-data-historical>

Table D: Observed Average Seasonal Mean Temperature in Pakistan from 1901-2020.

Source: Data collected by author from

<https://climateknowledgeportal.worldbank.org/country/pakistan/climate-data-historical>, chart by author.

Global warming is now picking up pace, and it is projected to be even faster in Pakistan in the coming decades than the rest of the world (Durrani). The average number of hot days and nights have increased in the southern, western and the Indus plains of the country by an average of 11 days since 1980 (Salik et al 7). This is expected to increase up to 60-75 days in the coming decades. The mean annual temperature in Pakistan is projected to increase by 1°C by the end of the 2020s, by 2.5°C by the 2040s and by 5.3°C by 2080 (Table F), whereas the projected increase in the rest of the world is 3°C by 2080, as per the Shared Socioeconomic Pathways (SSPs), which estimate future climates using development pathways, defined emissions and mitigation efforts (Climate Change Knowledge Portal). The brunt of this temperature rise in Pakistan is expected in the glacial regions (4°C to 5°C), with about a 2°C to 3°C rise in the south. Precipitation is expected to increase by 50% by 2080 in the northern regions (Table E), which would result in more rain cycles in monsoon months, and coupled with higher temperature, the melting glaciers would result in greater climate change induced disasters (Salik et al 7). It is projected now that by 2035-2044, 5 million people will be affected by extreme river flooding alone, and almost an annual 1 million population will be affected by coastal flooding and rising sea levels by 2070-2100 (Climate Change Knowledge Portal).

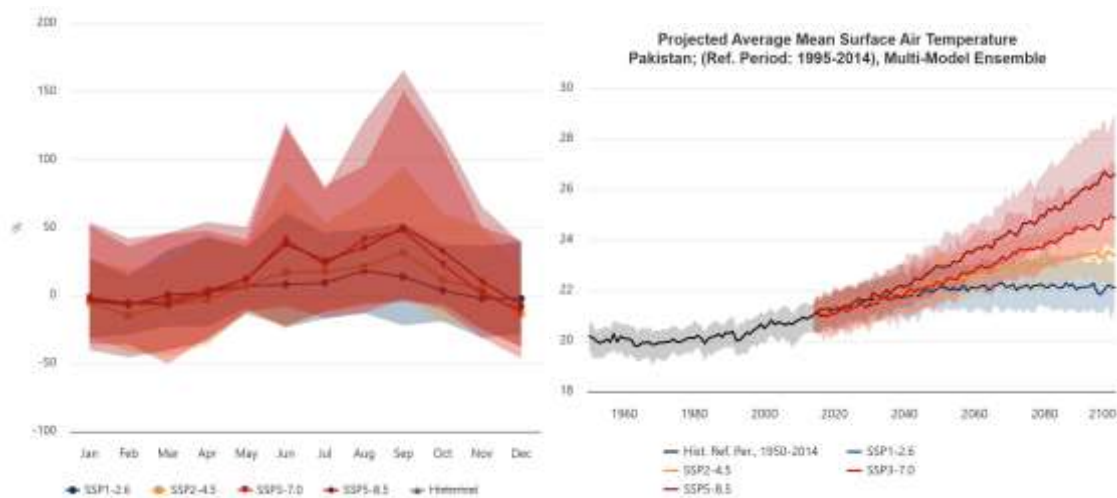


Table E: Projected Precipitation Changes in Pakistan from years 2080-2099

Source: <https://climateknowledgeportal.worldbank.org/country/pakistan/climate-data-projections>

Table F: Projected Average Temperature Rise.

Source: <https://climateknowledgeportal.worldbank.org/country/pakistan/climate-data-projections>

1.1 Pakistan's Internal Migration Profile

According to Rahman et al., internal migration typologies in Pakistan can be classified into four categories: (1) natural change, meaning improved health and sanitation which leads to high birth or low death rates in urban areas; (2) social change, represented through a change in societal patterns of education and family planning; (3) commercial change, which refers to opportunities other than agricultural productivity; and (4) economic change, meaning reduced agricultural employment. The past few years have added another chief migration typology into the mix, i.e. climate change and its adverse effects.

“Climate-induced migration exacerbates typical migration typologies, such as rural-to-rural, rural -to-urban, urban-to-urban, international, and seasonal migration” (Salik et al. 4). However, the exact data is a difficult feat to compile, and requires a thorough survey on the number of people migrating due to a direct or an indirect result of climate change, how the changes in climate will affect these people in their new places of residence and what effects such migrations will have on other socio-economic areas. “It is particularly challenging when the relation between climate change and migration is not linear and is dependent on a multitude of factors” (Saeed et al. 13), making it much more difficult to document.

Nevertheless, a handful of surveys have been conducted on general inter and intra-province migrations which can be analyzed “to shed some light on the patterns of current climate induced migration in Pakistan” (Durrani 19). Currently, it is estimated that 12% of Pakistan's population are internal migrants (UNFPA). Of these 12% internal migrants, as shown in Table G a vast majority are those who migrate from rural to urban areas. In Pakistan, an estimated 60% internal migrants are those who go from rural to urban areas, with 58.4% in Punjab, 53.6% in Sindh, 69.6% in KP, 70.3% in Baluchistan, 48.3% in Islamabad, 77.1% in FATA, and 68.2% and 74.4% in AJK and GB respectively. A 2019 Population Council report exploring migration as adaptation for climate refugees suggests that the highest migration zones in the country due to floods are the Northern Dry Mountains, the Barani Lands, and the Wet Mountain zones (Arif et al 67).

Province/Region	Rural to rural	Rural to urban	Urban to urban	Urban to rural	Total
All	15.9	60.7	19.7	3.7	100
Punjab	16.2	58.4	22.0	3.4	100
Sindh	4.8	53.6	33.3	8.4	100
Khyber Pakhtunkhwa	20.2	69.6	8.2	2.0	100
Balochistan	7.1	70.3	16.3	6.3	100
Islamabad	9.4	48.3	32.3	10.1	100
FATA	16.4	77.1	2.5	4.1	100
Azad Jammu and Kashmir	21.8	68.2	7.7	2.4	100
Gilgit-Baltistan	14.4	74.4	9.8	1.3	100
Agro-Ecological Zone					
Barani Lands	7.6	53.9	35.8	2.7	100
Northern Irrigated Plains	18.7	56.9	20.4	4.0	100
KP Northern Irrigated Plains	9.0	72.4	16.3	2.3	100
Southern Irrigated Plains	6.0	72.6	18.5	3.0	100
Wet Mountains	13.8	83.7	2.5	0.0	100
Northern Dry Mountains	35.5	59.1	4.1	1.4	100
Western Dry Mountains	6.8	76.5	9.9	6.8	100
Dry Western Plateau	1.4	1.3	70.0	27.3	100
Sandy Desert	4.9	65.1	30.0	0.0	100

Table G:

Source: Arif et al.

https://knowledgecommons.popcouncil.org/cgi/viewcontent.cgi?article=1754&context=departments_sbs_r-pgy

Hashmi lists the primary reasons for permanent climate-induced migration to be: (1) the rising sea levels, in the provinces of Sindh and Baluchistan, forcing coastal residents to move towards the inlands; (2) glacial melts and water scarcity, and the agricultural impact in the Indus River basin due to shortage of freshwater; and (3) agricultural shifts, and people seeking alternative employment opportunities due to decline in agricultural productivity from changing precipitation patterns. As for the temporary migration reasons, Hashmi lists flooding concerns, especially in the monsoon months, and crop losses due to excessive rainfalls to be the primary reason for people to leave their homes in search for alternate living spaces.

3. HOUSING CRISIS IN PAKISTAN

The housing limitations in urban and peri-urban Pakistan stem from several interdependent factors; high population growth rates, fast paced urbanization, the inability of housing projects to meet the growing demands at affordable rates, and the inflow of migrants from rural parts of the country adding to a system already overburdened. The scale of housing supply is significantly imbalanced, with just 1% units built annually for 68% population, earning minimum wages, whereas 56% units are built annually for 12% of the affluent population (Ali 29). While cities challengingly cope with the growing numbers from within, rural to urban migrations put an extra burden on the over-worked and over-capacity housing machinery. These migrations play a critical role in the over-extension of urban boundaries into peri-urban colonies, by increasing the population density, and hence the demand, which results in the formation of informal housing agglomerations to increase the supply curve (Ali 8). Majority of these migrators are semi-skilled or non-skilled, and in moving to larger cities, “consequently put pressure on the civic institutions and also

generate a problem of housing, which raise the prices of the houses and urban properties” (Farooq and Cheema 148).

The urban and peri-urban centers, currently, are facing an immense housing backlog. It is estimated that the current housing backlog in Pakistan is more than 10 million units, with a 3.4 million units’ backlog in the major cities of Pakistan and the surrounding informal settlements (Naeem and Aslam), with an annual increasing deficit of 3.5-4 million units (Iqbal). In Punjab, the current deficit is approximated at 5.5 million housing units, followed by a 3.1 million units’ shortage in Sindh, 1.3 million in Khyber Pakhtunkhwa and 0.5 million in Baluchistan (Naqvi). This dire shortage due to constant demand shocks has escalated land, rent and housing prices in urban residential schemes, making housing unaffordable for many owing to the short-term supply inelasticity. As a general rule, affordable housing is characterized as an expenditure of up to 30-40% of monthly household income, or the Equated Monthly Installments (EMI) on rent or mortgage payment of the occupied space (HBFC) The EMI in Pakistan, due to the rising rents and property prices, has amplified to an unprecedented degree of up to 50%, making property ownership as well as renting unaffordable. “a typical household with a monthly income of Rs. 63,504 may face an EMI of Rs. 31,603—about 50% of their income—making homeownership unaffordable. Even with zero interest, monthly payments remain too high for many families to afford” (HBFC). This lack of housing affordability is attributable to the large-scale disparity in demand and supply, which requires availability of approximately 700,000 new housing units annually to reach the market demand and make housing more affordable, whereas the current supply is between 350,000-400,000 new housing units annually (Ali; Naeem and Aslam).



Table H

Source: HBFC Report, <https://hbfc.com.pk/wp-content/uploads/2024/11/The-State-of-Housing-Affordability-in-Pakistan-Nov-2024.pdf>

Chart by author

Additionally, housing is not merely unaffordable but also inequitable; out of the housing in large cities only 29.5% is satisfactory (Mielke and Cermeño). “The housing conditions that are currently in place are marked by crowding, bad sewage systems, pollution, and shoddy building construction that provides neither security of tenancy nor protection from extreme weather.” (Naeem and Aslam). The infrastructure, outside of posh urban areas, is unsatisfactory, the living standards are subpar, provision of basic amenities are nonexistent and the housing prices are, nevertheless, exorbitant.

In spite of these housing difficulties in urban areas, internal migration continues to increase as adverse effects of climate change continue to rise with each passing year. The 2025 floods, some of the worst climatic catastrophes, has taken reportedly damaged, as per data issued by National Disaster Management Authority (NDMA) on 3rd September August 2025, a total of 9261 houses, amongst which 7,108 are partially damaged and 2,153 are entirely collapsed. As majority of the destruction has taken place in the northern parts of the country and the plains of Punjab, it is anticipated that a new wave of internal migrants will turn towards the megacities in the midland and southern regions of the country in search for housing and economic betterment. This population increase will create a new demand shock, causing further unplanned overgrowth of cities and urban sprawling to meet the demand. The migrators, who were forced to flee their homes due to the aftereffects of climate change, will thus be “forced to live in slums where they face numerous problems. Resultantly a mushroom growth of slums takes place, particularly in the developing countries” (Farooq and Cheema 148).

1.1 Demand and Supply of Housing

According to the report published by the Pakistan Mortgage Refinance Company Limited (PMRC), based on the current population and the average household size of 6.5, a total of 38,340,566 households exist, with an expected annual increase by 1,063,219 units. The projected increase of these number of households, and the required housing units by 2030 is 46,484,937 units. The urban population, estimated at 97 million, contains approximately 15 million households, whereas, the PMRC report estimates the supply of housing units in 14 urban districts of the country to be 12,439,471. Of these housing units, the vertical housing supply is 2,374,314 units, and the horizontal housing supply is 10,065,157 units. This leaves an approximate gap of 3 million housing units in the urban centers. The report, which conducted a primary survey, evaluated the current demand of housing in urban centers, which is also the housing backlog, to be approximately 2.5 million units, with an estimated future demand of 3.5 million units. Amongst the factors driving housing demand, the report includes population growth rate, migration, monthly income and expenditure, employment status and lifestyle changes (retirement, marriage, growing family etc.). As for the factors affecting supply of housing, the report lists urbanization and urban expansions to accommodate migratory pressures, inflations in land, construction and housing prices, as well as zoning laws preventing vertical expansions. As these factors continue to rise, the opposing market forces will further increase the demand and supply gap of the housing market. According to Malik and Wahid, fundamental gaps between housing demand and supply are also caused by economic inequality, skyrocketing land prices, unsatisfactory community participation, lack of key stakeholder partnership, insecurity of land tenure and limited planning.

1.2 Housing Crisis in Pakistan's Informal Settlements

Incessant proliferation of informal settlements and squatters near the city boundaries and adjacent agricultural and governmental lands has been taking place around Pakistan's mega cities to cater to the growing number of new residents each year. According to Rahman et al. this proliferation, which comprises of 40-60% of total urban constructed area in the country, is a natural consequence to urban population increases of more than 5 million annually. Despite the size of these housing colonies and the large numbers they house, many remain unrecognized under the law and are lacking in provision of basic necessities (Ahmad et al.). Nevertheless, informal settlements continue to experience surges of population growth, primarily after large-scale climatic events that force many to turn towards the cities. As highlighted above, this is due to the inability of the housing market to provide secure and affordable units to all; overpriced plots, pricey constructions and high rents in the affluent areas preclude majority of the

population from these areas. In comparison, the lower land costs in the informal settlements attracts the population with limited financing. Informal settlements too, however, are now experiencing shifts due continuous increased rural to urban migration. With the demand on continuous rise, and the supply not nearly enough to catch up and close the gap, several issues have now made way into the informal housing market.

These informal settlements include squatters, ISDs and ISALs which are either approved, and leased by the government for a certain amount of time, or have been illegally developed and occupied. Some of the slum areas do not even provide constructed residences for its dwellers, and many are left homeless, living in tents or even in open air. Malik et al. highlight the differentiating parameters within the informal housing schemes, between those in inadequately constructed living spaces and those who are homeless:

<i>Differentiating Parameters</i>	<i>Inadequately Housed</i>	<i>Homeless</i>
<i>Type of settlement</i>	<i>Spontaneous/informal</i>	<i>Spontaneous</i>
<i>Access to land</i>	<i>Invasion (legal)</i>	<i>Invasion (illegal)</i>
<i>Type of Government land</i>	<i>Not assigned for other use</i>	<i>Likely assigned for other use</i>
<i>Security of Tenure</i>	<i>Partial/temporary</i>	<i>None</i>
<i>Personal safety</i>	<i>Moderate</i>	<i>Minimum</i>
<i>Type of accommodation</i>	<i>Rented or ownership</i>	<i>Nomadic</i>
<i>Social status</i>	<i>Moderate</i>	<i>Very low</i>

Table I, Source: Malik et al. Table by author.

1.3 Consequences of Climate-Induced Migration on Informal Settlements:

Following are some of the effects which climate-induced internal migration has had on the housing market in the informal settlements of Pakistan's megacities:

Property Price Surge: Housing prices are correlated to multiple macro-economic factors such as GDP (Adams and Füss), interest rates (LIM and LAU), inflation (Goddard & Marcum), exchange rate (Abelson et al.), remittance (Akbar Zaidi) as well as population growth. It was Mankiw and Weil who determined the correlation between demographics and housing markets, establishing that higher birth rates had a significant effect on housing demand and pricing. The same was also concluded in later studies by Engelhardt and Poterba, and Aris.

Ali employed the DiPasquale-Wheaton 4-quadrant model for calculating housing demand ($D_t = \beta_0 + \beta_1 X_t + \beta_2 Z_t + \mu_t$) and supply ($S_t = \beta_0 + \phi_1 X_t + \phi_2 Z_t + v_t$), whereby X_t and Z_t representing the above listed macroeconomic characteristics. His data analysis concluded that with a 1% increase in population growth rate in Pakistan, housing prices rise by 12.99%, which leads to an annual housing price inflation of 33.12% with the 2.55% population growth rate of the country. Employing the same formula, it was estimated by Ali that from 2015 to 2020, rent and property prices suffered increases of 180% and 134% respectively. It was also estimated that a 1% increase in market inflation leads to a further 0.44% increase in housing prices. Evaluating the increased urban migration, which not only leads to greater human numbers in the area (increased population growth) but also increased market inflation due to higher demand of market goods, these macroeconomic factors combined increase housing prices significantly.

Rent prices too suffer drastic increases with growing migration and urbanization. Hussain et al. employed the following hedonic price model to calculate rent prices: $Rp=f(X1,X2,X3.....,Xn)$ with Rp representing rent pricing and X representing environmental, housing and structural characteristics. Amongst these characteristics is the growing demand of housing due to internal migration. The more the number of families depending on cheaper units in informal settlements, the higher they are willing to pay to find lodgings in the city, ultimately driving the price up.

Lack of Basic Necessities and Dire Living Conditions: Post-climatic disasters, when crowds from affected rural areas migrated towards cities, they turn inadvertently towards the slums and other informal urban areas due to the unaffordability of more posh urban areas. Here, the low supply elasticity of housing market compels them to opt for residences which lack basic amenities, access to clean water, sanitation, trash disposal, and sewerage. As most of the informal housing colonies are developed by third-party real estate developers without consent of the development authorities, provision of basic necessities is not on their agenda (Ahmad et al.). The developers have little interest in sewerage systems, electricity, running water, greenbelts, mosques, parks, clinics or other facilities. Due to lower prices in comparison to affluent neighborhoods, and the supply inelasticity of housing, such residences are endured by the lower income classes, especially those who have suffered financial blows from the adverse effects of climate change.

Impact on Property Rights: unplanned settlements suffer from haphazard record-keeping and fluctuating land allotments, which greatly impact property rights of homeowners. Moreover, land registration in these areas is more complex and far more likely to be fraudulent, which leads to property disputes. The land laws of the country mostly remain ineffective in dealing with such property disputes, owing to bureaucratic corruption and inefficiency to deal with the sheer number of such disputes (Ahmad et al.).

Social and Legal Implications: increasing urbanization and expansion of informal settlements have multiple social and legal consequences. Most of these settlements are on city outskirts and boundaries, from where commuting cost of workers to their place of employment becomes significantly higher. Roads are likely to become more jammed with more people on the road travelling longer distances (Ahmad et al.). With the migrants actively searching for jobs, urban areas have also become more pressurized to create adequate sources of employment for its number of residents. Schools, colleges and universities feel the strain of higher student numbers which these educational institutes are unable to accommodate. As explained by Mujahid, densification in peri-urban areas increases the demand and supply gap of access to basic facilities such as health, infrastructure and education, which make the informal settlements “sources of dissatisfaction and turbulence rather than growth and innovation. Due to messy urbanization, there is a drastic increase in urban slums poverty, housing sprawls, environmental issues and mobility problems.” These issues combined, raise crime rates and law and order concerns in the community; thefts, burglaries, instances of bodily harm become more common. As per Mujahid, intensified crimes in these disorganized neighborhoods is not merely because of heightened everyday problems but also because of the gap of services available to them and affluent urban neighborhoods. According to Peerzado: “... urbanization may also introduce health issues, insufficient houses, over-crowd, transportation, sanitation, water shortage, thrash disposable, educational, employments, crime, environmental, land degradation, poor infrastructure and pollution”. These negative implications act as hidden costs, which make living in informal settlements more costly than perceived.

Loss of Agricultural Lands: as already highlighted above, expansion of urban centers to accommodate for growing populations takes place at the expense of prime agricultural lands which are encroached upon. Urban infrastructures, primarily slums and peri-urban housing schemes are erected on major food

harvesting lands, creating loss of livelihood for the farmers and their labor force (Ahmed et al.). This reduces agricultural productivity and an overall crops shortage in the region is created by tweaking the supply demand curve of the food market. Loss of agricultural land also causes environmental degradation, including reduces greenery, fresh air and open spaces to accommodate migratory influx in concrete jungles. It has been recorder by Zaman that in Lahore district, the total agricultural land in use in 1972 was 94%, which had been reduced to 29.5% by 2010. Such unplanned expansions to navigate the housing market crisis are well on their way to create food market crises, where access to nutritious food will suffer a sharp demand shock with little supply elasticity and the marginalized and poor communities would once more pay the price (Farooq and Rashid 463).

Climatic Vulnerabilities in Informal Urban Settlements: Slums, squatters and *katchi abadis* are built on green, open areas, dried river banks, around gorges, railroads, highways and other spaces not appropriate for housing. They not only upset city functioning, but also suffer threats of climatic catastrophes. Dense and crowded infrastructures in the informal urban settlements are a source of heatwaves and create Urban Heat Island (UHI). Due to entrapment of heat within the concrete walls, temperature in these areas is significantly higher as compared to surrounding open, airy and green agricultural regions. As the informal settlements are less likely to have good ventilation systems, and have more human activity, house large numbers in limited spaces, with little to no foliage in the area, UHI have been documented to increase temperature in Karachi's slums by 5°C -7°C (Sheikh 4) causing massive casualties in previous years. Similarly, flooding has become a looming threat for peri-urban informal settlements, due to UHIs, higher heat and precipitation, poor water drainage facilities, loss of greenery and more soil erosion due to constructions. Expansions have made cities more vulnerable to pluvial and fluvial floods; Karachi has expanded 286% from 1980 to 2020 and this expansion to accommodate the housing demand has compromised almost 870 km of natural streams (Baig et al 1), now replaced by informal housing set ups. The August 19, 2025 rain spell in Karachi leading to urban flooding, which took the lives of at least 7 (Mishra) highlights the importance of a properly functioning drainage system, which is severely lacking in the city. Lahore, another densely populated city, is under severe threats of urban flooding due to increasingly substandard constructions and inadequate sewerage system which easily clogs under rainfall (Zia et al). Moreover, expansion of housing societies to the city outskirts, and inside the dried Ravi river path has caused great property damage due to the rising waters in the river from torrential rains and flooding.

Long-term Social Capital Costs: According to Ali, the growing informal settlements in Pakistan's urban areas are draining the public health and long-term social capital costs of almost 50% of the city population. This is due to higher transmission of diseases in slums and *katchi abadis*, from lack of ventilation, clean water, Urban Heat Island (UHI), overcrowding, urban flooding, crimes of bodily harm or the multitude of other issues prevalent in the areas.

Despite the wide range of negative effects increased internal migration thrusts upon the urban centers, it also brings with it a large force of skilled, semi-skilled and non-skilled labor actively seeking employment. This readily available labor supply enhances economic productivity by covering labor demand gaps in the urban industries, construction, manufacturing and services arenas. According to Farooq and Cheema, another positive aspect of rural to urban migration is the reduced agricultural land pressures, and the circulation of wealth from urban to rural areas through the workers who transfer remittances back home.

3.4 The Case Study of Lahore

The province of Punjab houses the greatest population of all provinces of Pakistan, and with Lahore as its

capital, and the second largest city of the country by land and population, it experiences heavy migrations from rural areas across the country. The current population of Lahore is approximately 15 million, projected from the 2023 Census. Whereas the influx of migrants in Lahore create a higher demand for housing and its associated facilities, supply is biased against these lower income groups due to unaffordable in the properly developed residential communities. When they are forced to dwell in the city's informal settlements, environmental situations, land ownership, uncertainty of tenure and construction patterns work against their everyday routines (Malik et al.). This is evident from surveys conducted in two of Lahore's informal settlements: the Karol Ghatti Slum and the Qalandarpura squatter, both near in vicinity and in the outskirts of Lahore, near Band Road. With well-established housing communities just across the road, the difference in living and housing conditions are stark.

The data collected by Malik et al. during survey of the Karol Ghatti slum included every 10th unit out of 50 units, with $N=50$, $n=10$ and $k=N/n=5$, hence a sample size of 5 from every 50 housing units. For the Qalandarpura squatter, a sample size of 10 ($N=100$, $n=10$ and $k=N/n=10$) was used. The effects of migration and overpopulation on informal settlements listed above are corroborated by Malik et al.'s findings, analysis and conclusions. The parameters of the study included physical (infrastructure, basic facilities and living conditions); social (sustained existence, intellectual behavior and perspective); economic (employment, commuting issues); and policy (governance and concerns by NGOs).

Karol Ghatti Slum

Physical Parameters

The housing in Karol Ghatti Slum is deplorable, and offers the lowest degree of amenities to its dwellers. There is a blatant lack of basic facilities such as water, electricity, sewage and sanitation. Housing infrastructures do not provide usable toilets, and communal defecation spots create long queues and unhygienic conditions. Drinking water is available in only one spot in the entire settlement. These conditions lead to oft-occurring water-borne diseases.

Accessible Shelter

The slums provide brief housing to shelter seekers, with the housing units majorly "scattered, crude and temporary" (Malik et al.). Families have been provided with tents which are easily foldable, packable and transportable in case of sudden eviction notices. Formal housing units and infrastructure is in limited quantity and majority dwellers focus on natural resources than on mechanical means of living.

Effective Governance

People speak openly against government inaction, inefficiency and blatant disregard for provision of basic constitutional rights of the lower income classes in the area. NGOs have highlighted their issues on multiple platforms but all efforts remain in vein as no positive steps are taken by the authorities to improve the deplorable living conditions.

Limited Intellectual Perspective

Majority dwellers lack the interest in improving their own lives; they prefer to marry young and continue to procreate in large numbers, with limited nutrition, clothing and basic amenities to provide to their offspring. Majority children in these areas are malnourished and susceptible to diseases due to their young age and lower immunities. These children are employed from a young age in beggary and similar activities to raise nominal funds for the families.

Employment and Commuting Issues

Slum dwellers often find themselves trapped in a low-income and low-skilled equilibrium. These migrants earn minimum wages, barely enough for sustenance, and their limited skill sets, large families and being

spatially limited to the outskirts of the city keeps them “in a sustained state of temporary and limited sources of income” (Malik et al.)

Qalandarpura Squatter

Physical Parameters

Qalandarpura faces several infrastructural deficiencies: there are insufficient waste disposal points and garbage is thrown in open plots, creating unhygienic conditions, bad stench and flies carrying diseases. Streets and main roads are broken, with large pot holes which accumulate rain water. No proper sewage system has been installed, and open manholes are cause of many accidents and loss of lives. There are no street lights in the areas, electrical wires from the electrical posts often flow freely and cause electrocution.

Accessible Shelter

Housing, though inadequate, is not as temporary as that in the Karol Ghatti slum. Families can rent spaces for longer periods of time and do not have to face frequent and sudden evictions. As the rents prices in these areas are considerably lower than other parts of the city, the residents are satisfied with the living situations.

Effective Governance

Despite being a certified squatter, ineffective governance is rampant due to shortage of technical expertise in the tehsil, district and union council levels. Officials mostly remain unconcerned with the living and housing conditions and hold non-cooperative attitudes towards the issues raised by the residents.

Limited Intellectual Perspective

People in the squatter have lost hope in betterment of their lives and living conditions. A sense of self-help is also lacking in these areas, where people do not participate in development programs to improve their own conditions. There is a general lack of social awareness in the residents, who only expect outside help to improve their conditions without taking any steps themselves.

Employment and Commuting Issues

Long commutes to low paying jobs on substandard local transport leaves many residents of the squatter fatigued. The distance from the main city also raises their commuting costs, and wastes hours of their days on the roads. Some residents have taken the initiative of opening ‘shop houses’ to avoid long daily commutes by opening small tuck shops in the lower portions of their houses.

4. URBAN CLIMATE RESILIENCE ANALYSIS:

Abdul and Yu define the concept of urban resilience as “the capacity of cities to act efficiently so that its residents and workforce, especially the vulnerable people, survive and thrive in spite of the stresses or shocks they encounter in their everyday lives.” Resilient cities are robust, reflective, flexible, redundant, integrated, resourceful, and inclusive in their systems (Abdul and Yu). Extreme weather events and rapid urbanization have become substantially entangled in Pakistan, and each occurrence of a climatic catastrophe poses serious consequences for the cities. It is, therefore, imperative that urban development schemes and projects give precedence to climate resilient urban development.

Climate change, rapid and unregulated population growth, internal migrations, housing shortage, inadequate spatial planning, diminished social capital, urban water scarcity and inefficient building by-laws all intertwine to create urban housing pressures in the country (Abdul and Yu 4-6), and the government has adopted multiple national as well as international policies, strategies and action plans for efficient and resilient city planning (Naeem and Aslam). A Ministry of Climate Change has been

established to focus primarily on the adverse effects of climate change and how to mitigate losses and increase resilience in coping with such events. An overarching framework, the National Climate Change Policy (NCCP) has been established by the ministry, which delivers a comprehensive action plan on addressing climate change, as well as climate change financing gaps. The NCCP, amongst other conditions and prerequisites, necessitated urban town planning as an adaptive measure in city expansion. Nevertheless, implementation of this policy has been challenging, as has been acknowledged by the Asian Development Bank, which has taken a special interest in pushing towards the policy (Chaudhry).

The Framework for the Implementation of the Climate Change Policy, 2014-2030 (FICCP) has also been established Ministry of Climate Change, which encourages formulation of comprehensive provincial action plans, a National Adaptation Plan (NAP), Nationally Appropriate Mitigation Actions (NAMAs), while taking into consideration the provisions of the UNFCCC. Both the NCCP and the FICCP have largely failed, as suggested by the Supreme Court of Pakistan in *Leghari v Federation of Pakistan*. According to Waheed et al., the failure of such policies is due to “financial constraints and capacity building issues” as well as “poor institutional coordination, corruption, and weak policy formulation and implementation processes” (795). Moreover, while these policies require the implementation of integrated management, they lack formulation of such implementation frameworks.

Amongst frameworks and policies on urban planning, the Vision 2025 was announced in 2014, which highlighted urban challenges and suggested several creative and eco-friendly measures for sustainable and resilient cities. According to Abdul and Yu, the Vision 2025 proposed “efficient mass transit systems, better security, zoning laws for ‘mixed-use’ areas, vertical rather than horizontal growth, meeting housing shortage, the provision of adequate municipal services” and several other measures. The proposals once again failed due to lack of implementation, as the actions listed in the Vision were not supported by the required implementation planning in the policy.

The National Housing Policy was created in 2001 and it came under the domain of the Ministry of Housing and Works, which was made responsible for its implementation. The policy however, did not cater to the climate change and resilience discourse, failing to include it as a factor in housing. As mentioned by Tariq et al., the policy is largely flawed due to its neglect towards both climate change and environmental impacts.

The Framework for Economic Growth (FEG), though never implemented, serves as an important document for policymakers due its call for resilient cities by employing vertical, rather than horizontal growth, making private inefficient government lands, encouraging public-private partnerships (PPPs), and calling for innovative, low-cost building methods. It also called for limiting growth of informal settlements and supported high-density, mixed-use urban development.

The Urban Climate Change Resilience Trust Fund (UCCRTF) funded by the Asian Development Bank and OXFAM, the Sindh Resilience Project funded by the World Bank, and the Naya Pakistan Housing Project initiated by the Pakistan Tehreek-e-Insaf (PTI) government are amongst some other projects undertaken by the authorities to encourage resilient urban development, but each of the projects fell short due to deficiencies within the their frameworks, such as calling for horizontal development instead of vertical, as well as due to implementation issues.

Amongst international frameworks, Pakistan has adopted the Sustainable Development Goals (SDGs) and the Sendai Framework for Disaster Risk Reduction 2015–2030 (Sendai Framework), which the Pakistan Disaster Management Authority (PDMA) is responsible for implementing through coordination with all relevant stakeholder.

In spite of undertaking such responsibilities, the government remains unsuccessful in making urban Pakistan resilient and efficient (Abdul and Yu). The ineffectiveness of domestic and international policies and frameworks adopted by the government is largely due to:

- Exploitation of funds by the government agents and third-party personnel,
- lack of interest on part of the concerned authorities,
- inefficiency and inability of official personnel charged with the duty to ensure application of the frameworks,
- deficiencies within the frameworks, including lack of implementation processes,
- poor inter and intra-institutional coordination, and
- lack of firm dealings with builders and third-party stakeholders guarantee.

5. RECOMMENDATIONS

Concluding this in-depth study and analysis of the impacts of climate induced rural to urban migrations on urban housing and informal settlements in the peri-urban areas, this paper submits the following recommendations. These suggestions are categorized as short-term strategies, which are accomplishable within 24-months' time, and medium to long-term goals, which would require longer time to adopt.

Short-term Strategies:

- *Raise awareness of the issue of climate induced migration:* First and foremost, it is of utmost importance to raise concerns of climate-induced migration on housing market and to highlight its import for the national policymakers, so that they may approve the necessary changes in current policies to adequately cater to the socio-economic challenges of the migrant families.
- *Comprehensive study of international resilience models:* It is imperative that the theoretical and practical guidelines from international urban resilience models, such as the Rockefeller Foundation City Resilience Framework, the Crunch Model/Pressure and Release Model, Asian Development Bank's three levels of city resilience, and Mehrotra et al.'s Risk reduction (resilience) model be examined thoroughly and strategized to encourage resilience in Pakistan's megacities.
- *Adoption of data-collecting mechanisms for monitoring of internal migration:* the lack of adequate data on the consequences of adverse climate effects and internal migration hampers its efficient monitoring, creating difficulties for informed decision-making by the authorities. According to Lonergan, government authorities need to adopt better interactions and working relations with NGOs and organizations working on population, environmental and migration mandates for more accurate statistics. Moreover, an easily accessible registration system is therefore suggested, made mandatory by the state legislature for all internal migrants to fill out. According to Saeed et al., this National Registration System will provide the government with the correct statistics of in-coming families, and help formalize the urban economy, which is largely informal at the moment as the migrant workforce is working invisibly in the cities.
- *Promote housing market balance and affordability by exploring creative and innovative methods:* an inter-governmental framework must be created to improve sustainability and affordability of housing by exploring innovative, cost-cutting techniques to counter the low-quality workmanship and sub-optimal construction methods. Moghayedi et al. call for developers, investors and contractors to adopt low-cost, affordable housing techniques in order to bring down the high demand for housing and the subsequent cost increases.

- *Joined departmental efforts towards a more climate-friendly development:* provided the country's extreme climatic change susceptibility, and the housing market challenges it exaggerates, it is of utmost importance that Pakistan adopts unified multi-sectoral tactics towards climate-resilient economic development. As emphasized in the National Climate Change Policy of 2012 and the 'Framework for Implementation of Climate Change Policy (2014-2030)', specific actions and procedures for climate resilience need to be planned by different ministries, such as population, agriculture, environment, poverty alleviation and economic growth in their sectoral policies. Furthermore, as suggested by Saeed et al. and Salik et al., the ministries need to ensure implementations of the policy changes by removing any procedural or structural barriers between inter-departmental coordination and communication.
- *Innovation and risk management in agriculture:* Provided the critical role that agriculture plays in Pakistan's economy, its exports and its labor market, the country now stands at a critical point where it suffers serious threats to its economy due to the replenishing agricultural lands and yields. With low GHG emissions and little contributions to climate change, it will have to mitigate its economic losses by adopting innovative agricultural strategies that can counter climatic threats. Furthermore, in order to decrease housing pressures in urban areas, innovative agricultural planning and financial support mechanisms for farmers during adverse climatic shocks must be established to decrease push factors for migration.
- *Piloting research programs on climate-induced migratory aspects:* more in-depth research be conducted on the various aspects and questions which need investigation, such as:
 - compiling a comprehensive list of circumstances and variables that prompt migration, primarily in the arid and semi-arid regions of the country,
 - how these trends can be altered due to future climate changes,
 - how climate-resilient economic development can be sustained and strengthened in stressed housing markets,
 - how better documentation and understanding of migration patterns can affect adaptation, influence migratory push and pull factors and shape housing institutional policies.

Medium to Long-term Goals:

1. Management of rapid urbanization through creation of transitional towns: internal migrations from rural areas to urban centers lead to extreme densification of urban areas, leading to unplanned and unbridled expansions of Pakistan's megacities, disrupting the welfare, safety and security of the city dwellers, putting severe pressure on the urban institutions and creating multitudes of socio-economic problems. As proposed by Jamal and Ashraf, creation of intermediate towns in between the rural and urban centers could take some pressure off the megacities. These intermediary towns, if equipped with adequate facilities of infrastructure, health and education, could act as sufficient pull factors for migrators to settle there instead of the large agglomerations they turn towards now. As for the large populations dwelling in slums under bad living conditions, these transitional towns could be push factors for them to leave the slums. This would also take pressure off housing market in the cities and bring rent and property prices to a steady low. Markets in intermediate cities may also help plug rural-urban income gaps by providing opportunities. The FICCP by the Ministry of Climate Change also suggested development of such towns and cities, but action is yet to be seen. The government and housing authorities must therefore take immediate measures to identify any available land, without

encroaching on agricultural lands, for relocating and resettling climate-induced internal migrants in these new towns.

2. **Public-Private Partnerships (PPPs):** PPP models between government agencies and private contractual companies are essential to cater to the growing demands of the housing market in any established economy, a successful housing market has a great significance: “housing construction is an indicator of the level of economic activity in any country. It signals the health of the economy.” (Rahman et al.). While there are numerous factors that create housing market crisis in the urban areas of developing nations, an inadequate construction sector, coupled with high construction and outdated construction techniques is a major problem. Public-Private Partnerships (PPPs) have proven to be an innovative means to curtail these issues by allowing private companies employing cost-effective and budgeted construction measures to meet the rising housing demands which the public sector has failed to meet. In the public sector, cost parameters limit competitive procedures, leading to persistent government dependence, in the private sector title transfers remove cost-distorting elements of the profit, creating a more competent use of resources (Rahman et al.).
3. *Vertical development planning on government lands:* to adopt tried and tested international frameworks and policies implemented by other nations to tackle densification and housing affordability, one of them being incentivization of vertical developments on government, instead of agricultural lands. Vertical developments in high-rise designated areas will create greater number of housing units with smaller ground footprints. Appropriate zoning and construction laws must be legislated and implemented effectively and horizontal developments on encroached agricultural lands should be disincentivized.
4. *Constructing much-needed dams, reservoirs and barrages for water storage:* it is imperative that under-construction projects such as the Diamer-Bhasha dam, the Dasu dam and the Kurram Tangi dam be completed to store water from torrential rains, limit destruction from floods and to revive water-scarce areas. This would limit the adverse effects of climate change, causing a reduction in internal migrations and the pressure on housing markets.

CONCLUSION

The investigative analysis conducted in this paper establishes climate-induced internal migration and urban housing challenges in Pakistan as complex, interlinked and multifaceted issues which the country has, till date, been unable to successfully gauge and regulate. As stated in Pakistan’s Climate Risk Country Profile: “Climate-induced migration remains a poorly understood area, and investment is needed to understand push and pull factors, where hotspots may form, and how communities might be supported in different local contexts. Research can support governance which embeds migration across sectoral planning.” While it is accurate to ascertain that the primary issue faced by urban housing market is the population boost from rural to urban migratory influx causing sharp demand shocks, more precise and targeted research is needed by the government to formulate adequate solutions through initiation of well-rounded strategies on housing availability, affordability, and sustainability. It has become essential, in the light of continued climate catastrophes, for the state to devise effective means of sustainable housing, through coordinated and joint efforts from all stakeholders. The civil society, along with the government and private sectors must pull together all resources to reduce the undesirable effects of urban densification and to ensure the housing market’s success. “The failure to take a conjunct action would not only jeopardize the lives and livelihoods of the people but would also threaten the stability of the state” (Hashmi

392). Conscious and targeted efforts are required by all stakeholders to boost the resilience of urban and peri-urban centers against the witnessed, as well as the anticipated, climate changes. The country, already on the lesser end of the HDI, and with a large population suffering from multidimensional poverty, must act before climate-induced migrations further strain the socio-economic development of the nation and poverty rates climb even more. Urban areas can no longer bear exorbitant land prices, increased rental charges and longer travel times. Therefore, it is only with a genuine interest and active involvement of the responsible authorities that Pakistan can improve its housing market functioning, in order for the people to have a more equitable and brighter future.

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