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Climate, Mobility, Peace and Security Interplay

How are climate, security, and human mobility dynamics interrelated in Pakistan?

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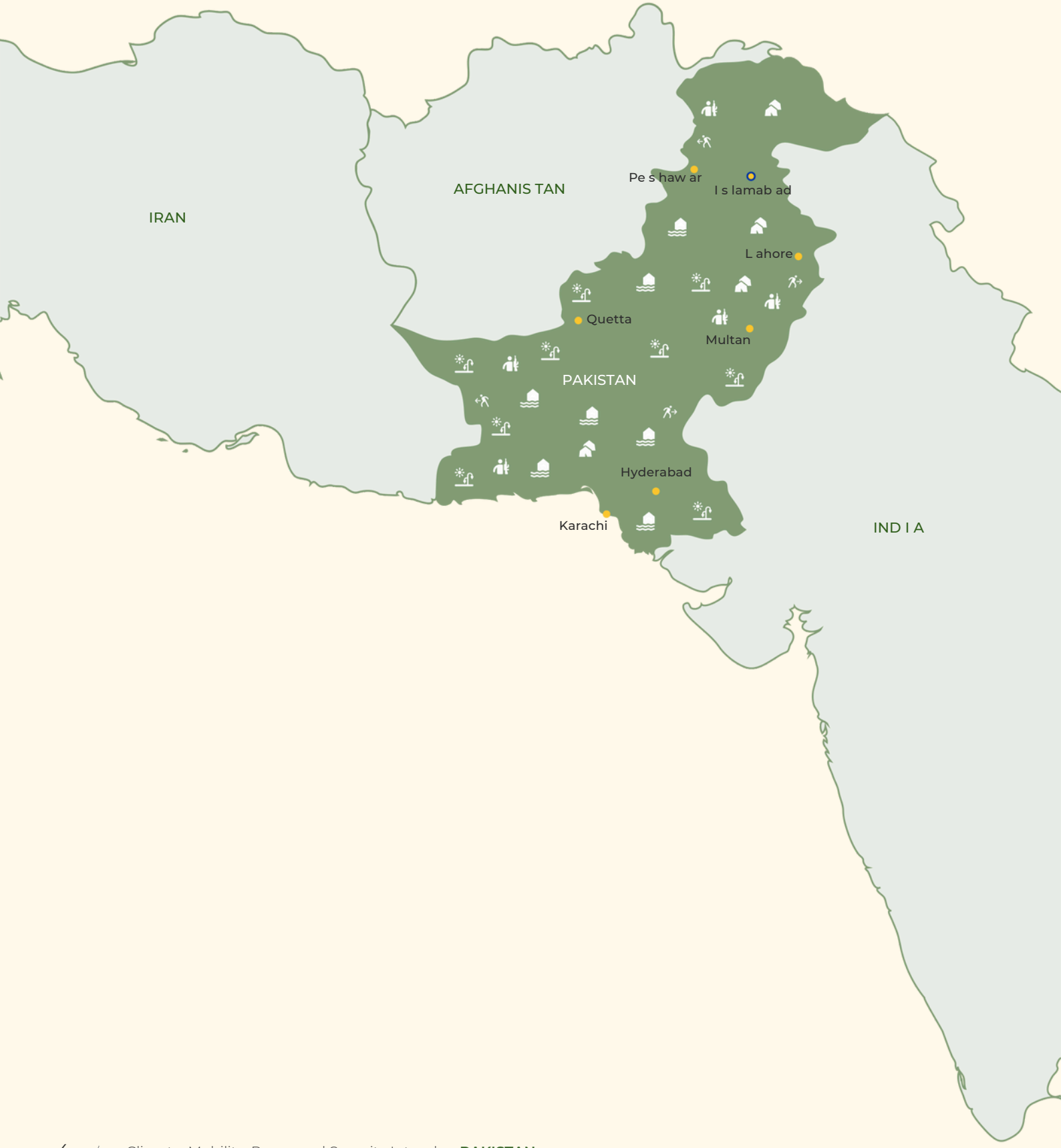
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EXECUTIVE SUMMARY

Pakistan faces a complex interplay of climate, conflict, and mobility challenges that profoundly impact human security and exacerbate risks of fragility and instability. This analysis identifies three critical pathways through which climate, conflict, and mobility interact. None of the pathways described here are strictly linear; they tend to interact with one another and are mobilized through local factors, including vulnerability and exposure to both climate and conflict drivers.

The first pathway examines how climate change and extreme weather events disrupt land, water, and food systems in Pakistan, amplifying human security risks and increasing the likelihood of conflict and/or displacement. In this pathway, climate-related resource stress exacerbates pre-existing economic, social, and environmental insecurities, particularly in rural agricultural communities dependent on vulnerable ecosystems. Rising temperatures, irregular precipitation, and increasing runoff from glacial melt are straining the Indus Basin's water resources, contributing to climate hazards; such as flood, and reducing agricultural productivity. This exacerbates poverty, food insecurity, and livelihood loss, increasing deprivation, political grievances, and the likelihood of out-migration and/or conflict. For example, following the 2010 floods, inequitable distribution of relief and recovery resources aggravated historical tensions between landowners and tenant farmers (Arai 2012). In Sindh, landlord-tenant relations, already fraught, deteriorated further as landlords controlled aid distribution, using it to assert social control (Arai 2012). Repeated extreme events continue to strain the state's capacity to deliver aid and address the basic needs of affected populations, including shelter, sanitation, and livelihood support. Since the devastating floods of 2022, the state and international community have struggled to mobilize resources matching the country's needs (Frege et al. 2023)

The second pathway explores how climate and conflict-related mobility, if poorly managed, can lead to human security risks, potentially increasing the likelihood of conflict in origin and destination areas and/or additional forced migration. Displacement driven by extreme climate events (such as floods) or conflict disrupts livelihoods, exacerbates poverty, and overwhelms the state's capacity for protection and service delivery. Inequitable or insufficient distribution of relief and recovery resources due to limited state capacity or external support from landlords—as seen in the aftermath of the 2010 floods—can deepen grievances, especially in rural areas where landlord-tenant tensions are already high. Those fleeing climate hazards or conflict in rural areas often migrate toward more urban centers seeking relative safety and improved economic opportunities. However, popular destinations for rural-urban migration, such as Karachi, often feature high levels of generalized or organized crime, presenting unique human security risks for new arrivals. Tensions can also increase between new arrivals and longer-standing residents if infrastructure and public services are not scaled to match increasing demand. In some cases, this can fuel ethnic tensions. Households in rural areas can also become "trapped" in place, or rendered immobile by lacking the resources, opportunity, or motivation to migrate away from declining socio-ecological conditions.

The third pathway explores how climate-related hazards and displacement exacerbate pre-existing conflicts, creating a cycle of fragility

and insecurity. In regions with ongoing conflicts, climate hazards and/or displacement can have a compounding effect that further disrupts social cohesion, undermines peacebuilding or conflict resolution mechanisms, and strains already fragile social, political, and economic systems. Southwestern Balochistan faces recurring drought conditions during summer months and extreme snow events in the winter, particularly in particularly the Chagai, Kharan, Noshki, and Washuk districts. These conditions exacerbate physical, food, economic, and health insecurities, pushing people to migrate toward neighboring districts facing terrorism and insurgency- fueled instability. These insecurities can, in turn, render individuals more likely to be recruited by armed groups and decrease the opportunity costs for engaging in violence (Yamin and Malik 2014a). Similarly, the 2010 floods in central and southern Punjab exacerbated religious extremist narratives, such as such as those by Jamaat- ud-Dawah (JuD)and Lashkar-i-Tayyeba (LeT), who recruited small holder farmers who had lost their land. This fueled local conflict, ethnic violence, and crime, further destabilizing areas already ravaged by flood (Saad, Mahsud, and Mian 2024). The violent conflict between the TTP and the military in Swat Valley (2007-2009), compounded by the 2010 floods, intensified pre-existing tensions and disrupted the region's economy, infrastructure, resource base, and social, political, and cultural structures (Muzamil et al. 2021). Despite the government regaining control in 2009, the displacement of 2.7 million people due to the conflict and floods left lasting human security challenges, with many returning to find their livelihoods destroyed. The Government of Pakistan's inability to rehabilitate displaced populations and maintain peace, partly due to compounding conflict and climate hazards crisis, allowed the Tehrik-e-Taliban (TTP) to advance their agenda, perpetuating a cycle of violence.

SECTION 1

CONTEXT

Climate exposure, vulnerability, and adaptation

Pakistan'stopographyandclimate are diverse, ranging from Himalayan Mountain and sub-mountain regions in the north, and expansive desert plateau in central, southern, and western areas. The Indus River runs north to south, culminating in the Indus Basin. Pakistan's entire 990 km southern border is coastline abutting the Arabian Sea. The northern mountainous areas, including the Himalayas, experience extreme winters with temperatures dropping as low as -50°C, while the southern slopes can receive up to 2000mm of annual rainfall (ADB 2017). Large glaciers, including Siachen and Biafo, feed the Indus River, which provides water for almost 90% of agricultural production and contributes up to 23% of Pakistan's country's GDP (Janjua et al. 2021; WB group 2023c). The Hindu Kush Himalayan region (HKH) in Pakistan's high- altitude northern areas is one of the largest and most diverse mountain ranges in the world, covering 4.3 million km²(Ning et al. 2013). It encompasses multiple parallel ranges, including the Karakoram, Hengduan, Himalayas, and Hindu Kush, featuring diverse landscapes such las plateaus, river valleys, and adjoining foothills. These mountains are vital for water supply to rivers, habitats for wildlife, livelihoods for local inhabitants, and the region's natural beauty (Ning et al. 2013), which supports climates ranging from tropical to high alpine. It features tropical and subtropical rainforests, temperate broadleaf and coniferous forests, as well as alpine scrub, meadows, and desert steppes (Xu et al. 2019). Home to over 210 million people, the region's rivers sustain approximately 1.3 billion residents in surrounding basins(Ning et al. 2013). With variations in altitude and orientation, HKH hosts diverse ecosystems, including forests, agricultural land, rangelands, water bodies, and permafrost and glaciers.

In contrast, the majority of southern Pakistan is arid to semi-arid, with 75% of areas receiving less than 250mm of rainfall annually, and summer temperatures reaching up to 49°C in some regions (ADB 2017). The western and southern parts of the country include the Indus River basin plain and the Balochistan Plateau. The Balochistan Plateau is a vast wilderness of mountain ranges in the southwest,

averaging about 600 meters in altitude, and is characterized by wide desert expanses and annual rainfall of less than 210mm. The transboundary Indus basin spans 1.1 million km², covering parts of Afghanistan, China, India, and Pakistan (S. Abbas et al. 2022). Pakistan holds the largest share, with 520,000 km² (65% of the total area), including Punjab, Khyber Pakhtunkhwa, most of Sindh, and eastern parts of Balochistan (S. Abbas et al. 2022). In the Indus Plain, average annual rainfall is 230mm, with higher winter temperatures in the upper plains and higher summer temperatures in the lower plains. The Indus Delta extends up to 150 kilometers of Pakistan's 990-kilometer coastline, featuring numerous creeks, mudflats, and mangrove marshes.

Pakistan faces a wide range of climate-related weather hazards, including floods, heavy rainfall, heat waves, droughts, cyclones, and glacial lake outburst floods (GLOFs), which often compound to threaten human security. Pakistan ranks as the 5th most vulnerable country to climate change according to the Global Climate Risk Index (UN-Habitat 2023), and stands at 149 out of 187 countries on the ND-GAIN index (ND-GAIN 2022), which evaluates resilience alongside climate vulnerability. Average temperatures in Pakistan are projected to rise by 1.4°C to 3.7°C by 2060, and by 6.0°C by to 8.3C 2300 (GoP 2023b). Higher increased temperature are projected for the winter months and in the northern regions (GoP 2023b). Climate models indicate increasing rainfall between January and June, and decreasing rainfall between July and September, along with increasing annual precipitation in the upper Indus Basin and decreasing annual precipitation in the lower Indus Basin (GoP 2023b). Projected reductions in glacier volume and snow cover are expected to alter the seasonal flow patterns of the Indus River System and increase the occurrence of glacial lake formation and outburst events (GoP 202 3b).

Floods are the most frequent climate hazard in Pakistan, followed by storms (heavy rainfall and wind), heat waves, and landslides (1980–2020) (WB group 2020). The Indus River Basin, covering 65% of the country, is particularly susceptible to flooding. Growing human demand, inefficient water systems, and rising temperatures that accelerate glacial loss threaten the Indus's runoff and Pakistan's limited reservoir and groundwater capacity (ADB and WB 2021). Pakistan faces diverse types of flooding, including fluvial floods, flash floods, urban flooding, coastal flooding, and glacial lake outburst floods (M. Aslam 2018). Fluvial floods in the Indus plain are highly destructive due to flat, densely populated terrain, while flash floods impact hilly regions in Khyber Pakhtunkhwa, Balochistan, and Punjab (Tariq and Van De Giesen 2012). Urban flooding has become frequent in cities like Karachi and Lahore due to heavy rains and poor drainage, while coastal flooding from cyclones affect parts of Sindh and Balochistan (M. Aslam 2018). While small-scale urban and flash flooding occur annually in various terrains, the mega floods of 2010 and 2022 were catastrophic events, inundating vast areas and causing widespread destruction along the Indus Basin.

The 2010 flood was caused by unusually heavy rainfall in July and August, with more than 200 mm recorded over a four-day period in Khyber Pakhtunkhwa and Punjab. This increased flows in the Swat and Kabul Rivers to 400,000 cusecs, exceeding the previous record by 40% (Hashmi et al. 2012). The high water flow inundated into catchment area all along the Swat, Kabul and Indus river resulting in 1,700 deaths and affected 20 million people (Z. Aslam, Bell, and Claxton 2023; Oxley 2011). Pakistan's 2022 floods were the most damaging since 1961. Driven

by the compounding effects of monsoon rainfall in flood-affected areas of Sindh, which received five day accumulated precipitation of more than 400 mm in August, and a severe heat wave in northern areas that triggered intense glacial melt, contributing to high river flows (Nanditha et al. 2023a; Z. Aslam, Bell, and Claxton 2023). The floods submerged a third of Pakistan's landmass, claimed 1,739 lives, and impacted 33 million people (Z. Aslam, Bell, and Claxton 2023). Mega-floods, such as those in 2010 and 2022 that far eclipse typical flood conditions, are driven by the compound effects of unusually heavy monsoon rains (influenced by the La Niña effect), combined with elevated river flow due to heatwaves accelerating glacial melt in the Northern Pakistan (Nanditha et al. 2023b; Tanoue et al. 2021; Oxley 2011). Heat waves, characterized by prolonged high temperatures and dry conditions, are becoming more frequent and intense. Northern areas, the Sindh and Punjab plains, central and western Balochistan, and all of KP are identified as the most vulnerable (J. Ali et al. 2018; GoP 2023b). Rising temperatures in northern areas also heighten the risk of rapid snowmelt and downstream flooding, while heat waves in the agricultural plains jeopardize food security, local livelihoods, and GDP.

Approximately 80% of Pakistan is arid or semi-arid. In many of these areas, land degradation is prevalent, driven by overgrazing, water overuse, and unsustainable farming practices that are exacerbated by climate-related water scarcity, increasing temperatures, and evaporation (ADB and WB 2021). Erratic precipitation, frequent floods, prolonged droughts, and intense heatwaves accelerate soil erosion and desertification. Coastal areas, particularly the Indus Delta—situated below 2 meters above sea level—are highly vulnerable to sea-level rise, increasing the risk of severe flooding and saline intrusion (ADB and WB 2021). These threats degrade land quality and agricultural yields, disproportionately impacting marginalized communities .

Projected temperature increases, shifting precipitation patterns, extreme weather events, and reduced water availability all pose severe risks for Pakistan's agriculture sector. This sector employs nearly 39% of the national workforce, and even more in in rural areas, and contributes 22% to GDP (ADB and WB 2021). A temperature increase of approximately 0.5°C to 2°C by 2040 is projected to reduce yields of key crops like cotton, wheat, rice, sugarcane, and maize by 8% to 10% (Dehlavi et al. 2015). By disrupting land and water systems, climate change is expected to reduce food availability, limit access, and lower quality by decreasing crop yields and driving up production costs.

The Government of Pakistan enacted its first climate change legislation in 2017—the Pakistan Climate Change Act—establishing three key institutions: the Pakistan Climate Change Council, the Pakistan Climate Change Authority, and the Pakistan Climate Change Fund (Jamal 2019). Building on the 2012 policy, the National Climate Change Policy was updated in 2021 to provide a comprehensive framework for addressing adaptation and mitigation challenges (GoP 2021b). Pakistan's commitment to climate action is evident in its submission of Nationally Determined Contributions (NDCs) to the Paris Agreement in 2016, and its latest national communication to the UNFCCC in 2019 (ADB and WB 2021). Additionally, the National Disaster Risk Reduction Policy (GoP 2013) offers a framework to enhance resilience and preparedness across sectors. It is supported by the National Adaptation Plan (NAP) (GoP 2023b) and the National Disaster Management Plan (NDMP) (GoP 2012), which outline specific measures for adaptation and disaster response.

Socio-economic and political context

Witha population of 241million andanaverage annual growth rate of 2.6% since 2017, Pakistan is rich in ethnic, linguistic, religious, and cultural diversity (GoP 2023a). This diversity traces back to its pre-partition colonial legacy. Major ethnic groups include Punjabis, Pashtuns, Sindhis, Baloch, and Mohajirs, along with various sub-ethnic communities that contribute to the nation's multicultural identity. Urdu is the national language, English serves as the official language, and regional languages—such as Pashto, Punjabi, Sindhi, Hindko, Balochi, Kashmiri, Shina, and Balti—are widely spoken in specific areas. More than 96% of Pakistanis are Muslim (Pakistan Bureau of Statistics 2023), and represent numerous various including Sunni (Deobandi and Barelvi), Shia, and Shia- Ismaili. Religious minorities in Pakistan include Hindus and Christians, who make up 1.6% of the population, along with followers of other faiths (Pakistan Bureau of Statistics 2023).

The population is predominantly young, with 59% under the age of 24 (GoP 2023a). The gender ratio is balanced, with 48.5% female and 51.5% male (GoP 2023c). There is a distinct rural-urban divide, as 61% of the population resides in rural areas (GoP 2023a). The average household size is 6.3 members, similar in rural and urban settings. Population density varies but averages to 303 people per square kilometer (GoP 2023a). Provincially, Punjab has the highest density at 622 people per square kilometer, while Balochistan has the lowest density at 43 (GoP 2023a). Urban centers such as Karachi, Lahore, Rawalpindi, Faisalabad, and Islamabad are exceptionally dense.

Pakistan's GDP fluctuates annually, influenced by domestic politics, regional conflicts, and global economic conditions. In 2024, Pakistan's GDP per capita ($1,590) was 38.0% lower than its South Asian neighbors; including India, Bangladesh, Nepal and Bhutan (IMF 2024a). Investment levels have varied over time, influenced by periods of increased domestic and foreign direct investment. These shifts are shaped by domestic stability and the regional political and economic environment. The investment-to-GDP ratio in Pakistan remains static at around 14% between 2018 and 2023, the lowest among its regional peers (GoP 2024). Pakistan's poor economic progress stems from political instability, interruptions in the democratic process, lack of policy continuity, and poor governance. These challenges reflect deeper issues including mismanaged provincial economic disparities, ethnic divisions, sectarianism, and religious fundamentalism. The fiscal situation faces ongoing challenges, including budget deficits and debt management issues. Over the past decade, the fiscal deficit has ranged from 4.1% in 2016 to 7.9% in 2022 (GoP 2024). Trends in borrowing and debt service reflect fluctuations in fiscal and current account deficits, as Pakistan's gross debt-to-GDP ratio has steadily risen from 58.5% in 1994 to 69.2% in 2024 (IMF 2024b). The country's political economy is shaped by feudal culture, patronage, and rent-seeking behaviors, with political power and agenda-setting authority concentrated in the hands of a select few.

Agriculture is responsible for 39.0 % of the employment (37.0 % in rural areas and 2.0 % in urban areas), making it a key driver for livelihood and poverty reduction, due to its linkages with other sectors (ADB and WB 2021). Of the total 79.6 million hectares of land within Pakistan, 34.7 million hectares (43.6%) is arable land, with 22 million hectares (63.4%) under cultivation (GoP 2022a). There are two major cropping systems: kharif crops, sown from April to June and harvested from October to December, and rabi crops, sown from October

to December and harvested from April to May. Agriculture contributed an annual average of 19% to national GDP between 2020 and 2022, of which crops accounted for 9.9% of total GDP(FAOSTAT 2023; IMF 2024a). The major cash crops in Pakistan—wheat, rice, maize, and sugarcane—are crucial the livelihoods of rural farmers. During the same time period, wheat (2.5%), rice (2.5%), sugarcane (1.0%), and maize (0.8%) together contributed 6.8% to national GDP (FAOSTAT 2023; IMF 2024a). Livestock production is also vital, contributing 9.1% to national GDP (2020 to 2022) and supporting the livelihoods of approximately 8 million households (Ilyas et al. 2021; FAOSTAT 2023; IMF 2024a). Although fisheries contributed only 0.05% to the national GDP on average between 2020 and 2022, it is a key livelihood source for vulnerable coastal communities (FAO 2024). In 2021, marine fishing, which comprises 64.0% of fisheries production, is concentrated in Sindh and Balochistan, while inland fishing, contributing 36.0%, is primarily practiced in Punjab, Khyber Pakhtunkhwa, and Sindh (GoP 2021a).

The Indus River system is the primary source of water for domestic, industrial and agricultural use delivering 180 billion cubic meters (bcm) annually through its river system, with about 128 bcm diverted to distribution canals (Basharat 2019). The transboundary Indus River Basin spans a total area of 1.12 million km², shared by Pakistan (47%), India (39%), China (8%), and Afghanistan (6%) (FAO 2011). In Pakistan, the Indus Basin covers approximately 520,000 km², or 65% of the territory, including the entire provinces of Punjab and Khyber Pakhtunkhwa, most of Sindh, and the eastern part of Balochistan. After the Indus system, rainfall (50 bcm annually) and groundwater (50-60 bcm annual usage) are the other major water sources (Basharat 2019).

Poverty and inflation are deeply intertwined, reflecting Pakistan's weak economic performance. As of 2023, 37.2% of the population lives below the $3.65 per day poverty line (based on 2017 PPP) (WB group 2023b). Recent estimates from the Multidimensional Poverty Index (MPI), which assesses deprivation across 15 indicators in education, health, and living standards, indicate 39.5% of the population is multidimensionally poor. The rural-urban trend in MPI reveals an increase in the headcount ratio of multidimensionally poor individuals in rural areas, from 9.5% in 2014-15 to 17.3% in 2019-20, and a slight decrease in urban areas, from 54.2% in 2014-15 to 51.9% in 2019-20 (PIDE 2021). Inflation remains persistent, with significant fluctuations in food prices, impacting the cost of living. In 2023, Pakistan saw a sharp 30.8% increase in the Consumer Price Index, marking one of the highest annual increases in prices (WB group 2023a).

A significant number of children in Pakistan remain out of school, and poor education quality contributes to "learning poverty"—the inability to read and comprehend by age 10. Currently, 39% of school-aged children are out of school (GoP 2022b) and 75% cannot read age-appropriate text (WB group 2022). Primary education completion stands at 67%, drops to 47% at the lower secondary level, and is just 23% at the upper secondary level (UNICEF 2023). Girls' enrollment and completion rates lag boys', particularly in poor households, rural areas, and conflict-affected regions. Marginalized adolescents face systemic barriers such as poverty, poor-quality services, and discriminatory norms, limiting their access to education, skill development, and employment opportunities (UNICEF 2023). Malnutrition poses a major challenge to Pakistan's development, with severe long-term impacts on human capital and economic growth.

Among young children, 40% are stunted, 30% are underweight, 18% are wasted, and 10% are overweight—all rates higher than any other South Asian country (WB group 2022).

Women's status in Pakistan is shaped by deeply ingrained patriarchal norms that severely limit their rights, opportunities, and autonomy. Consequently, many women are excluded from decision-making at the personal- (e.g., health or education), household- (e.g., mobility), community- (e.g., local matters and traditional governance), and political levels (e.g., formal governance) (T. S. Ali et al. 2022). This lack of agency undermines their autonomy and identity, leaving women vulnerable to systemic discrimination. Cultural practices further entrench marginalization; women are commonly subject to early and forced marriages, denial of inheritance rights, discrimination in service provision, mobility restrictions, and physical abuse (T. S. Ali et al. 2022). These challenges create a cycle of disempowerment, limiting women's social, political, and economic contributions. Gender disparities are particularly pronounced in education, health, and employment. More than half of women aged 15-64 years have never attended school, and those who have, drop out at significantly higher rates than boys (UN-Women 2023). This situation is worse in rural areas, where 75% of young women (aged 15-24) are not in education, employment, or training (UN-Women 2023). Health inequities are similarly severe, with women facing limited access to prenatal and postnatal care, restricted reproductive rights, and inadequate nutrition, resulting in high rates of maternal mortality and morbidity (T. S. Ali et al. 2022). Women's participation in the labor force is strikingly low at just 21% (UN-Women 2023). Of those employed, 67% of women work in agriculture, often in low-paid or unpaid roles, while their representation in the services (16%) and manufacturing (14%) sectors is minimal (UN-Women 2023). Barriers to economic participation include low education levels, lack of skills, mobility restrictions, gender stereotypes, and sex-segregated job roles (T. S. Ali et al. 2022).

There is stark inequality in socio-economic development among the provinces of Pakistan. Punjab, the most populous province, has the highest HDI and GDP share, benefiting from better access to education and healthcare (UNDP 2020). Sindh follows with relatively high HDI values, driven by its larger economy, notably due to Karachi, the economic hub. However, Khyber Pakhtunkhwa and Baluchistan lag behind with lower HDI values, primarily due to poor education and healthcare outcomes (UNDP 2020). This trend is reflected in the disparity in income across provinces, with the gap between the richest and poorest provinces widening in recent years.

Human mobility

Rural-urban migration, internal displacement, and refugee movement are the main forms of human mobility in Pakistan, each influenced by a combination of distinct but overlapping factors. Since 1980, Pakistan's urban population has tripled from 22.4 million to 93.9 million in 2023, and is projected to rise from 32% of the population in the 1998 Census to 50% by 2030 (UNFPA 2017; GoP 2023a). This rapid urbanization is primarily driven by rural- to-urban migration (Naz 2021). Key push factors include poverty, socio-economic disparities, and limited countryside livelihood opportunities (Farah, Izhar, and Maan 2018). The lack of policy, planning, and legislation to manage internal migration has created human security risks for migrants such as health and food insecurity, sociocultural exclusion, personal safety concerns, socio- economic discrimination, and limited access to services (Rajan 2016).

Climate- and conflict-related internal displacement has also been a growing issue over the past two decades. Displacement due to extreme climate events and natural disasters—such as floods, storms, droughts, and earthquakes—is unfortunately common. Widespread flooding in 2022 displaced 8.2 million people, making it the largest disaster displacement event globally in the past since 2010 (IDMC 2023b). Prolonged droughts, water scarcity, declining agricultural productivity, and growing climate insecurity—particularly within the Indus Basin—further force people to migrate (Salik et al. 2020). Between 2008 to 2023, 5.1 million people were displaced as a result of conflict in Khyber Pakhtunkhwa and Balochistan (IDMC 2023a).

Since 1980, Pakistan has hosted one of the world's largest refugee populations, mainly from Afghanistan (UNFPA 2017). Continuous waves of refugees have arrived due to Afghanistan's protracted conflict, from the Soviet invasion to the recent return of the Taliban (S. Ahmad 2018). These waves occurred in 1979/80, from 1991-2000, and post-2001, with many refugees settling in camps or with host communities in central and southern Khyber Pakhtunkhwa and Balochistan, based on tribal ties and existing cross-border networks. Refugees from earlier waves who secured Proof of Registration (PoR) cards often moved to urban and semi-urban areas for better livelihoods (UNFPA 2017). Over the past few years, there has been a growing trend toward the repatriation or outright deportation of Afghan refugees. The 2023 "illegal Foreigners Repatriation Plan (IFRP)" legally formalized this practice, resulting in the repatriation of more than 600,000 Afghanis in just twelve months (IOM 2024).

Conflict and fragility

Pakistan's domestic security landscape is characterized by a complex web of internal and external dynamics. Pakistan's prolonged fragility leads to shifting levels of conflict, driven by the actions of diverse actors and regional dynamics, sometimes causing human casualties and displacement. (M. Waseem 2011; Yamin and Malik 2014b). Long-standing sectarian, ethnic, and political disputes, compounded by external conflicts including the US invasion, occupation, and exit from neighboring Afghanistan, have made Pakistan one of the most fragile and least peaceful countries globally. It ranks 140th out of 163 on the Global Peace Index, which measures peace across three domains: social security, ongoing conflict, and militarization (IEP 2024). Additionally, Pakistan is ranked the 27th most fragile state on the Fragile State Index, which assesses a state's vulnerability to collapse based on twelve conflict indicators (FFP 2024).

Pakistan's security challenges are deeply influenced by its external environment, particularly its relationships with neighboring countries and global powers. Historical territorial disputes with India, especially over Kashmir, have propelled Pakistan into an arms race, prioritizing military security at the cost of trade and regional cooperation (M. Waseem 2011). The Afghan conflict, beginning with the Soviet invasion in 1979 and continuing through decades of external intervention and protracted violence, has spilled over into Pakistan, resulting in a refugee crisis, the proliferation of arms, and the entrenchment of militant networks (Yousaf 2020). The porous Afghan-Pakistan border remains a hotspot for transnational militant activity, significantly affecting Pakistan's security and governance.

Internally, Pakistan faces a multifaceted security crisis shaped by socio-economic disparities, weak governance, and the militarization of society. A focus on military responses over inclusive socio-economic policies has alienated marginalized regions like Balochistan and the Newly Merged Districts (or NMDs, known as Federally Administered Tribal Areas until 2018) (Yousaf 2020). These areas, often neglected in terms of development and representation, have become hubs of violence, with extremist actors exploiting local grievances to mobilize individuals into violent activities. While military operations against insurgents are necessary to combat terrorism, they frequently result in internal displacement and civilian casualties, further exacerbating anti-state sentiments (Yousaf 2020). Urban centers like Karachi suffer from political and ethnic rivalries, fueling instability, while rural areas contend with militant activities and inter-tribal conflicts (Yamin and Malik 2014b). Weak governance and ineffective law enforcement perpetuate these cycles of violence in both, urban and rural areas.

The rise of groups like the Tehreek-e-Taliban Pakistan (TTP), with connections to transnational networks such as the Afghani Taliban, highlights Pakistan's militant landscape. Emerging from Pakistan's involvement in the Afghan Jihad, these groups target both civilian and military targets, including foreign contractors working on state-led development initiatives (such as the China-Pakistan Economic Corridor). They also exploit weak state capacity in regions Baluchistan and the Newly Merged Districts of Khyber Pakhtunkhwa (Yousaf 2020). Although military operations have weakened some militant networks, they have also created splinter groups, prolonging instability. Heavy-handed approaches, such as operations in South Waziristan, the Swat Valley, and Balochistan, have displaced millions and deepened anti-state sentiments among local populations (Yousaf 2020). The reliance on military solutions, without addressing underlying grievances, has proven insufficient for sustainable peace.

Sectarian strife between Pakistan's Sunni and Shia communities is also a persistent issue. Groups like Lashkar-e-Jhangvi have been responsible for repeated attacks on Shia minorities, with regions such as Balochistan and Gilgit-Baltistan experiencing severe violence (M. Waseem 2011). Furthermore, the Hazara community, comprised mainly of Shia Muslims in residing in Balochistan are often targeted by Lashkar-e-Jhangvi (LEJ) and Tehrik-e-Taliban (TTP) (Bhattacharya 2015). Ethnic sectarian conflicts stem from regional geopolitics and domestic ideological divisions, often perpetuated by state policies favoring certain groups. Ethnic tensions also highlight the challenges of Pakistan's diverse demographic makeup. In Karachi, competition for resources and political dominance among Muhajirs, Pashtuns, Sindhis, and Baloch has led to targeted killings and gang wars (Yamin and Malik 2014b). Political sectarianism has been at the center of Pakistan's struggle for political stability and is influenced by complex ethnic and regional dynamics rooted in post-independence power struggles. Partition resulted in political developments that prioritized ideological mobilization, centralization of power, militarization of governance, and a national vision centered on security (M. Waseem 2011). In Pakistan, political sectarianism has been driven by demands for autonomy and control over natural resources, provincial socio-economic development inequality, fueling between the province and the federal government (Yamin and Malik 2014b).Examples of such tensions include the ongoing Baloch rebellion (1973–present), the Sindhudesh movement (1980s), the Muhajir militancy in Karachi (1980s), and the contemporary Saraiki and Hazara movements (Nazir 2019).

SECTION 2

CLIMATE-SECURITY-MOBILITY PATHWAYS

This preliminary analysis of the interactions between climate, mobility, peace, and security is based on a systematic literature review and has been validated by a team of local and international experts familiar with the Pakistani context. The research process consists of a systematic literature review and qualitative content analysis to explore the complex dynamics arising from the interplay between climate, mobility, and peace-conflict systems. Context-specific literature, including research articles, position papers, and grey literature (such as reports, briefs, and policy papers), was identified using a taxonomy of terms related to climate, mobility, security, and peace. This framework guided the selection of knowledge materials for review and analysis by the research team.

Recognizing the inherent complexity of relationships, we have employed a risk-based approach to form "impact pathways," or event sequences in which climate, security, and mobility variables may interact to drive emergent outcomes. While the three pathways presented here do not represent the full spectrum of possible linkages between climate, peace, and security, they have been chosen because they are well-represented in relevant peer-reviewed literature. These pathways should not be read simply as linear event sequences. Instead, we aim to briefly introduce key linkages that occur within complex socio-ecological systems and are heavily dependent on local variables. Collectively, the three pathways provide a snapshot of how key relationships have played out in different parts of Pakistan, as documented in scientific literature.

Pathway 1:

INCREASING RISKS TO HUMAN SECURITY DUE TO CLIMATE'S IMPACT ON LAND, WATER, AND FOOD SYSTEMS

Climate change and extreme weather events are disrupting social and ecological systems throughout Pakistan, amplifying the risk of conflict and/or displacement by driving resource competition, exacerbating inequities in access and distribution, and directly impacting livelihoods and food security. These trajectories interact with pre-existing economic, social, and environmental insecurities to drive new or reignite pre-existing tensions. At household level, when in situ adaptation fails, out-migration increases in likelihood. At the local level, rural communities that rely heavily on agriculture and related livelihoods are especially vulnerable, as changes in resource availability, access, and usage heighten human security challenges. At the national level, inter-provincial competition over resources, exacerbated by climate-related resource scarcity, fuels ethnic divisions. Political tensions between provincial administrations over water distribution and hydropower development—such as the Kalabagh and Diamer Bhasha Dams—extend to community-level conflicts. These inter-provincial tensions are driven by power imbalances between upstream and downstream provinces, unequal distribution of risks and benefits, socio-economic disparities, and historical grievances (Mustafa et al. 2017). At community level, water can become a tool of conflict rather than a cause. It is often used as leverage in local political and ethnic struggles, particularly to rally agricultural communities against opponents in Punjab and Sindh, where access to clean water and irrigation water is a major point of contention (Ranjan 2012). Displacement can result when either local social-ecological systems fail to support livelihood generation, extreme weather forces households to flee for safety, or when increasing violence becomes too much to bear. Internationally, the fragile water-sharing agreement between Pakistan and India remains susceptible to geopolitical strains and climate-related pressures. The cascading impacts of climate change on Pakistan's land and water systems are intensifying human security challenges and elevating the risk of conflict and/or displacement.

Rising temperatures, shifting rainfall patterns, and accelerated glacial melt are also straining Pakistan's surface and groundwater resources. Climate change affects the water cycle through increased evaporation, altered monsoon patterns, rapid Himalayan glacier melt, and reduced groundwater recharge (Maqbool 2023). These changes heighten water stress, decrease storage capacity, and increase the variability of river flows (Maqbool 2023), leading to more frequent flooding (Babur et al. 2016). Groundwater depletion, driven by over-extraction, shifting cropping patterns, and reduced recharge, disproportionately affects rural and urban populations reliant on this resource (Mujtaba et al. 2022). For example, surface water availability during the kharif season declined from 7.75 billion cubic meters (Bm^3) in 2013 to 4.81 Bm^3 in 2018, with similar trends during the rabi season (Mujtaba et al. 2022). This scarcity increases agricultural water demand, leading to resource competition and inequities in access. Groundwater depletion significantly affects the access and distribution of water for more than 70% of urban and 97% of rural populations, who rely on it for household needs and livelihoods (Mujtaba et al. 2022). In Balochistan, the karez system—a community-

based system of groundwater extraction for agricultural irrigation—has sustained communities for thousands of years but is now under threat from increasing over-extraction. These climate-related pressures pose a direct threat to traditional ways of life and, thus, social cohesion.

Rising temperatures and changing precipitation patterns are disrupting biodiversity, particularly in the northern mountains and marine ecosystems, accelerated by human activities. In the north, accelerated glacial melt threatens native species, while invasive species that prey on crops, such as wild boar in Khyber Pakhtunkhwa, thrive (Khan, Gul, and Khan 2015). Overgrazing and deforestation further degrade these ecosystems, undermining agriculture and livelihoods (Khan, Gul, and Khan 2015). This increases the likelihood of displacement in peaceful areas, such as in Gilgit-Baltistan, and conflict-prone areas, like Khyber Pakhtunkhwa and Balochistan, where livelihood insecurity exacerbates existing vulnerabilities or creates new ones, driving people to leave their homes. In marine environments, coral bleaching and changing currents jeopardize fisheries, posing risks to coastal communities dependent on these resources (Haider Ali and Hussain 2023). Due to Karachi's proximity to fishing communities, it is a common destination for rural-urban migrants, whose arrival can amplify tensions over resources (land and water) and economic opportunities, in a dense city already burdened by generalized crime, poor public services and infrastructure, ethnically-drive politics, and sectarianism.

Climate-related disruptions to water and land systems threaten Pakistan's agricultural productivity, food security, and rural livelihoods. Poverty, food insecurity and landlessness has been linked with increased likelihood of violent conflict in Pakistan (Malik 2011). Key crops, such as wheat, rice, maize, cotton, and sugarcane, are facing yield declines due to rising temperatures, floods, and droughts (Nadeem, Jacobs, and Cordell 2022). For example, higher temperatures have negatively impacted wheat, while erratic rainfall disrupts rice and maize growth (Syed et al. 2022). The decline in wheat yield and basmati rice production is expected to worsen food insecurity and malnutrition, especially in rural areas (Syed et al. 2022). In livestock, heatwaves and water scarcity have reduced milk production by 20–30%, affecting farmer incomes (Q. Abbas et al. 2019). These challenges are particularly acute in regions like western Sindh and Balochistan, where agricultural output is heavily dependent on groundwater (Q. Abbas et al. 2019). Declining productivity exacerbates rural poverty and malnutrition, leaving communities more vulnerable to socio-economic instability. Areas with high levels of deprivation, such as Swat, North Waziristan, and Dera Bugti—where food insecurity is particularly acute—are also among Pakistan's most conflict-affected regions (Malik 2011).

Urban centers including Islamabad, Karachi, Lahore, Peshawar, and Rawalpindi face increasing risks from urban flooding, heavy downpours, heatwaves, droughts, storm surges, and flash floods (Atta-Ur-Rahman and Shaw 2015). These climate hazards exacerbate the pressure on an already depleted and scarce land and water resources, and on the limited capacity of the administration to provide adequate infrastructure or basic services such as electricity, water, and waste disposal. These hazards further exacerbate health risks, such as the spread of diseases and air pollution (Babar et al. 2021). Rising food prices due to reduced agricultural productivity further increase urban inflation, disproportionately affecting vulnerable populations (Bandara and Cai 2014). Poor urban planning has led to the proliferation of densely populated, disadvantaged, low-

income settlements such as Ibrahim Hyderi, Lath Basti, and Rehri Goth in Karachi. Migrants, sometimes already displaced from other areas, tend to settle, but often face additional environmental hazards that increase the threat of being displaced once again (ICRC 2020). Large, insecure urban areas like Karachi are susceptible to ethnic politics and sectarianism, with rural-to-urban migration potentially exacerbating existing crime, terrorism, and generalized insecurity (Ahmed 2018).

Climate change and extreme weather events increase the scarcity of the natural resources necessary for livelihood generation. This includes the water, land, and forests essential for agricultural production (crops, livestock, fishing) and linked value chain actors, as well as manufacturing, food processing, and textile production. This in turn, can increase the likelihood of intra- and inter-communal conflict in areas dependent on these vulnerable livelihoods. For example, water shortages in Khyber Pakhtunkhwa's Karak district have led to violence (Rasool, Saeed, and Shah 2020). In Khyber Pakhtunkhwa's Newly Merged Districts (NMDs) landlessness, food insecurity, and poor resource access contributes to the growth of militant groups, such as Tehrik-e-Taliban Pakistan (TTP), who exploit these grievances to mobilize support from marginalized communities (Saad, Mahsud, and Mian 2024). In the wake of the 2010 and the 2022 floods, terrorist organizations such as TTP, Jamaat-ud-Dawah (JuD), Lashkar-e-Taiba (LeT), and the Baloch Liberation Army (BLA) increased relief and aid operations in KP and Balochistan, garnering local sympathy and bolstering their recruitment efforts (Saad, Mahsud, and Mian 2024). Additionally, the potential for civil unrest and social discord is exacerbated by district, provincial, and federal governments that struggle to provide basic services, economic opportunity, or fully address social grievances.

Furthermore, elites often capture resources through corruption, favoritism, nepotism, and bribery, leaving marginalized communities without access to agricultural land, water, and productive infrastructure (B. Aslam, Akhtar, and Nasim 2022). Water scarcity has heightened inter-provincial political tensions, with the Government of Sindh accusing the Government of Punjab of overusing Indus River water for irrigation and hydroelectric projects, exacerbating ecological concerns and political instability (Imran 2021). At the regional level, India and Pakistan's water cooperation under the Indus Waters Treaty is strained by climate change and contested hydroelectric projects, heightening the risk of an international dispute (Zahoor 2024).

Pathway 2:

CLIMATE AND CONFLICT-RELATED MOBILITY LEADING TO HUMAN SECURITY RISKS IN ORIGIN AND DESTINATION AREAS

Displacement and forced immobility stemming extreme climate hazards and/or pre-existing conflict present significant challenges to human security, increasing the risk of additional forced migration and/or conflict—if poorly managed. Climate-related migration disrupts the human security of affected populations, particularly through its impact on livelihoods, entrenchment of poverty, and the state's inability to provide adequate aid and basic services (Barnett and Adger 2007). These migration patterns interact with pre-existing tensions and introduce new pressures on resources, economic conditions, and livelihood opportunities in destination areas, amplifying the risk of conflict. Factors such as resource depletion, overpopulation, economic competition, and disputes over land and water use in urban centers; such as Karachi, Lahore, Islamabad, have been identified as significant drivers of conflicts linked to climate-related mobility in Pakistan (F. Ali et al. 2018). In 2010, many flood-affected households migrated to Mohajir areas in Karachi, including Sindhi households from interior Sindh and Pashtun households from Khyber Pakhtunkhwa. These shifting demographics triggered resentment among Muhajir communities due to increased competition over land, water resources, and economic opportunities, leading to a notable intensification of ethnic conflict in the city (Makki et al. 2020; Crisp, Morris, and Refstie 2012).

Between 2008 and 2023, 25.5 million people were displaced by climate events, with 95% of these displacements resulting from floods. In some cases, the increasing frequency and severity of climate-related disasters have led to repeated displacements (H. B. Waseem and Rana 2023). Some return to areas of origin, despite the likelihood of recurring climate hazards, particularly flooding (Salik et al. 2020). Reasons for return include the psychological connection one's home, formal land ownership or informal rental agreements, social ties, and limited financial resources (Salik et al. 2020). Pakistan now faces increasingly severe annual flood events. When combined with pre-existing poor socio-economic conditions, elite exploitation, and the state's inability to efficiently disburse aid, these events exacerbate grievances among affected populations, creating tension not only with the state but also with local elites and along ethnic lines. For example, following the 2010 floods, inequitable distribution of relief and recovery resources aggravated historical tensions between landowners and tenant farmers (Arai 2012). In Sindh, landlord-tenant relations, already fraught, deteriorated further as landlords controlled aid distribution, using it to assert social control (Arai 2012). Repeated extreme events continue to strain the state's capacity to deliver aid and address the basic needs of affected populations, including shelter, sanitation, and livelihood support. Since the devastating floods of 2022, the state and international community have struggled to mobilize resources matching the country's needs (Frege et al. 2023). International aid pledged remains only partially disbursed, highlighting gaps in financial and institutional capacity (Frege et al. 2023). As vulnerabilities increase across physical, infrastructural, social, economic, and institutional domains, the risks to human security intensify (H. B. Waseem and Rana 2023).

Climate disasters also drive migration by disrupting food security, reducing food availability, and driving up prices (H. B. Waseem and Rana 2023). This creates food crises, particularly in riverine areas, where food becomes scarce and unaffordable (H. B. Waseem and Rana 2023). Rural households, reliant on ecological systems for livelihoods, are particularly vulnerable. For example, riverbank erosion in Punjab and Sindh displaces landless communities, compelling them to migrate in search of economic opportunities (D. Ahmad and Afzal 2021). Food insecurity is closely linked to migration, as households with limited or no farming land and few employment opportunities face increased pressures to relocate.

In Pakistan, many rural residents move toward cities seeking safety from violent conflict, improved livelihood opportunities, and access to services (D. Ahmad and Afzal 2021; Salik et al. 2020; Crisp, Morris, and Refstie 2012). More than 5 million Pakistanis were displaced by conflict (often terrorism or counter-terrorism operations) between 2008 and 2023, (IDMC 2023a). Urban areas—frequent destinations for those who are displaced from and agentically migrate from rural areas—may experience heightened human security risks if service delivery is not scaled to match increasing demand. For example, the arrival of Pashtuns in Karachi, fleeing violence in Khyber Pakhtunkhwa and Baluchistan, has triggered political resistance from Sindhi and Mohajir political constituencies due to perceived changes in the ethnic composition of host communities and competition for jobs and services (Makki et al. 2020; Crisp, Morris, and Refstie 2012). In diverse cities such as Karachi, ethno-political parties strategically exploit grievances, fueling sectarianism. Historical and ongoing displacement patterns, shaped by ethnic dynamics, significantly influence the trajectory of conflicts in Pakistan.

Not all households can successfully adapt in place amidst declining environmental conditions and may become immobile either by choice or necessity. Rural households that depend on agricultural production often lack the financial means or social capital to successfully adapt. While poverty is the most common driver of vulnerability, demographic marginalization can further restrict adaptive capacity; this is true for women, who face gender-based marginalization, the Hazara Shia community, who are persecuted for their religion, and Afghan refugees, who lack access to formal services and face the risk of deportation due to their nationality. Vulnerable households may become “trapped” in deteriorating social or ecological conditions or forced to return to insecure geographies after suffering a displacement event. It is often socially unacceptable for women to move without male family members, who themselves often migrate outward, sometimes seeking work after disasters like floods or droughts (Abbasi, Naeem, and Ansari 2021). This can trap women in precarious conditions. Afghan refugees, who have traditionally used cross-border and domestic movements, resource networks, and circular migration to cope with displacement, also face diminished mobility options due to heightened politicization over the past two decades (Mielke and Etzold 2022)

Pathway 3:

CLIMATE HAZARDS AND CLIMATE-RELATED DISPLACEMENT INFLAMING PRE-EXISTING CONFLICTS

In some cases, pre-existing conflicts can be exacerbated by the impacts of climate change and mobility flows. Climate change and variability can amplify the likelihood of displacement, particularly in protracted conflict areas characterized by deuterated human development, entrenched poverty, and political marginalization. Climate hazards may make it harder for households to shelter in place, rendering migration a more viable adaptation strategy than remaining in place. The negative effects of conflict and climate hazards may also compound to depress livelihood generation, pushing households to engage in economic migration. Ongoing conflicts can limit the ability of local and national governments to support climate adaptation efforts, equitably manage natural resources, respond to community conflicts, or support mobile populations through service or infrastructure provision. As a result, conflict zones provide fertile ground for extremist groups to address the unmet needs of local populations and exploit anti-state frustrations for violent or criminal activities. Consequently, even in post-conflict situations where tensions are present, but violence has subsided, climate hazards or large population movements may trigger its re-emergence, undermining stability, and resilience. Moderate-to-severe drought conditions in southwestern Balochistan (Chagai, Noshki, Kharan, and Washuk district) during the summer months, paired with extreme cold and snow events in winter months, exacerbates environmental, food, economic, and health insecurities. This can, in turn, displace household to neighboring districts in Balochistan already grappling with terrorism and insurgency-fueled instability (Moin 2023). In destination areas, declining human security may lower the perceived opportunity costs for joining extremist groups, increasing the likelihood of violence. Similarly, following the 2010 floods, in central and southern Punjab, pre-existing religious extremism, ethnic violence, and crime increased as Jamaat-ud-Dawah (JuD) and Lashkar-i-Tayyeba (LeT) from Punjab recruited small riparian farmers whose land was damaged by flood waters (Saad, Mahsud, and Mian 2024).

Events in the Swat Valley illustrate how long-standing conflict conditions can become inflamed by climate change, climate hazards, and population movements. Tensions date to the 1970s, when the Swat Valley—previously semi-autonomous—was merged into Khyber Pakhtunkhwa province. In the process, the federal government seized large areas of forestland, traditionally inhabited by local communities, which was previously not under the government control (Muzamil et al. 2021). These communities lacked documentation to support formal land claims, and resulting ownership disputes generated anti-government resistance (Muzamil et al. 2021). The anti-government resentments were further aggravated following a misguided government decision in the 1980s to build local public schools and religious schools (madrasah), as part of an effort to boost literacy, on the disputed land seized in the 1970s (Muzamil et al. 2021). Radicalization within the schools and madrasas led to a large number of students joining the fight against US forces in Afghanistan from 2001, prompting law enforcement agencies to crack down on

these institutions (Basit 2014). However, this only intensified anti-government and anti-law enforcement sentiments. During this period, the Taliban, who had expanded their influence in the region, began disseminating propaganda criticizing law enforcement agencies, Pakistan's judicial system, and its government writ large for their shortcomings in providing basic services, employment, and livelihood opportunities for Pakistanis (Basit 2014). These attempts were successful in hardening anti-state grievances among the local population. By 2007, the Taliban under the banner of Tehrik-e-Taliban Pakistan (TTP) had seized complete operational control of the Valley. Militants funded their activities by selling illicit timber, deforesting hundreds of hectares of forest and inflicting widespread ecological degradation (Muzamil et al. 2021). In addition to capturing its resources, such as forest and agricultural land, they began extorting of local businesses and exerting control over local politics, sharply curbing girls' access to education. This turned the Swat Valley into a base for militant activities targeting the Pakistani government, and triggered a large-scale counter-terrorism operation by the Pakistani military in 2007 (Muzamil et al. 2021). The operation lasted several years and inflicted significant damage on ecosystems and biodiversity, as security forces targeted forests housing militant hideouts and training camps (Muzamil et al. 2021).

Both climate change and the impacts of longstanding conflict, including poverty and ecological degradation, exacerbated the impacts Pakistan's 2010 floods—the most severe ever in terms of quantity of rainfall, lives lost, household displaced, and damage to land and infrastructure (Atta-ur-Rahman and Khan 2013). The 2010 -floods were caused by unprecedentedly high monsoon rainfall, combined with heavy snow and glacier melt, which increased the water flow in the Swat River, causing it to overflow its natural levees and flood the catchment area. This area, characterized by flat terrain and fertile soil, is intensively utilized for agriculture, settlements, and infrastructure. Additionally, conflict-related deforestation had reduced the land's natural capacity to mitigate flood damage through holding soil and reduced surface runoff, worsening the impact on local communities (Muzamil et al. 2021; Atta-ur-Rahman et al. 2017).

The compound impacts of longstanding conflict and extreme flooding had a devastating effect on Swat's economy, natural resource base, physical infrastructure, and socio-political systems. The military's counter-terrorism operation displaced 1.2 million people between 2007 and 2009, and an additional 1.5 million were temporarily displaced by the 2010 floods(Makki et al. 2020). Households that returned to Swat in 2009, after the cessation of violence, faced significant livelihood challenges due to depleted savings, loss of productive agricultural assets, and a lack of agricultural wage labor opportunities (Oxfam 2010). The flood caused extensive damage to agricultural land, housing settlements, highways, railway lines, electrical grids, communication networks, and bridges connecting different regions within the valley (Atta-ur-Rahman and Khan 2013). This significantly restricted the mobility of flood-affected persons as well as providers of aid (Rafiq, Saeed, and Golam Hassan 2024). The impact was particularly devastating for those displaced during 2007–2009 who remained within the valley, living in camps situated on land within the Swat River's catchment area. In Lower Swat, farming and trade dominate livelihoods, while in Upper Swat smaller landholdings support livestock and forest-based resources, in addition to local tourism (Muzamil et al. 2021). The compound crises of militant conflict and the extreme

flooding in the Swat Valley severely disrupted livelihoods (Rafiq, Saeed, and Golam Hassan 2024). Smallholder farmers lost income as their lands were damaged, while conflict deterred tourism, resulting in significant local business losses (Rafiq, Saeed, and Golam Hassan 2024). Decreasing trade worsened local poverty, driving many to migrate outward and increasing the susceptibility of those who stayed to the extremist narratives propagated through madrasas by TTP (Muzamil et al. 2021).

Although violence subsided once the government regained control of Swat in 2009, lasting peace remains elusive in Swat Valley due to the lingering effects of long-term conflict, climate hazards, and forced mobility dynamics. Displacement from the conflict (2007-2009) and the flood event of 2010 radically altered the region's social, political, and cultural structures. Established systems of social cohesion and conflict resolution—such as the council of elders (Jirga), men's guesthouses (Hujra), and traditional hospitality networks—were disrupted (Makki et al. 2020). These structures had historically underpinned social cohesion, and their erosion weakened the ability of traditional governance institutions to maintain peace. Secondly, TTP capitalized on displacement to advance their strategic aims. Members of the groups , familiar with the region's terrain, integrated among displaced populations (Rafiq, Saeed, and Golam Hassan 2024). This created a security threat for law enforcement agencies, political actors, local communities, and rehabilitation staff. These threats resulted in a militarized approach to governance in Swat, with the military playing a dominant role in socio-political affairs and a restrictive civil society space restricting development and perpetuating tensions (Avis 2016). Lastly, the government's inability to rehouse IDPs further amplified anti-state grievances. In the post-conflict stage, the government, with international support, launched extensive reinstatement and rehabilitation efforts for returning internally displaced persons (IDPs) (Azman Hashim, Rafiq, and Hassan 2022). However, these efforts faced numerous challenges and fell short of achieving full rehabilitation (Azman Hashim, Rafiq, and Hassan 2022). The change in social, political, and cultural dynamics within Swat further undermined the state's ability to effectively implement rehabilitation programs. Security threats, infrastructural deficiencies, bureaucratic hurdles, financial constraints, and a lack of community engagement compounded these issues, hindering progress (Rafiq, Saeed, and Golam Hassan 2024).

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About CGIAR FOCUS Climate Security CGIAR aims to address gaps in knowledge about climate change and food security for peace and security policies and operations through a unique multidisciplinary approach. Our main objective is to align evidence from the realms of climate, land, and food systems science with peacebuilding efforts already underway that address conflict through evidence-based environmental, political, and socio-economic solutions.