

**RESEARCH PAPER****Climate Change and Climate Induced Migration in Pakistan: A Threat to Human Security (The Study of RajanPur and Taunsa Sharif after Flood 2022)****Prof. Dr. Rehana Saeed Hashmi**

Professor, Department of Political Science, University of the Punjab, Lahore, Pakistan

***Corresponding Author:** Rehana.polsc@pu.edu.pk**ABSTRACT**

Climate change is expeditiously reshaping the socio-geographic landscape of Pakistan and thus has compelled the communities to adapt to the unrivaled environmental challenges. The unprecedented climate change has raised concerns regarding human security in Pakistan. The background of this study is related to the massive damage of infrastructure and human loss during and after flood 2022 in the areas of Southern Punjab (RajanPur and Taunsa Sharif). The principal objective of the study is to understand the hazardous impact of the trilogy of climate change, climate-induced migration, and human security. By analyzing the intersecting factors such as water scarcity, damaged livelihoods, lack of shelter, security concerns, agricultural shifts, and extreme weather events of 2022, the article highlights significant problems of the flood affected population. A mixed method approach has been opted for conducting the research, i.e., qualitative methodology has been used for developing a theoretical understanding of climate change, climate-induced migration, and human security. Moreover, quantitative methods such as surveys have been conducted in the affected regions. The mixed method research design has been operationalized following a case study approach. The study suggests that a comprehensive approach is imperative to safeguard human security in Pakistan.

Keywords: Climate Change, Climate Induced Migration, Flood, Human Security**Introduction**

Pakistan is one among many climate vulnerable states. The pattern of climatic change is converted in to climate crisis. The weather pattern in Pakistan is also changed from mild to harsh both in summer and winters, despite this the four weathers which ones added beauty to Pakistan now vanished. Thunder storms, abrupt rains, hail storms and out of pattern rainfalls are also causing floods in different areas.

It is a global critical issue for various reasons, as it significantly impacts the environment, leads to frequent natural disasters, and disrupts ecosystems. The changes in weather patterns significantly impact human health, pose more significant economic risks, exacerbate inequality among vulnerable populations, and, lastly, affect the long-term sustainability of Earth. Climate change is also known to threaten human security by undermining livelihoods, compromising cultural and individual identities, increasing migrations, and undermining and challenging the capabilities of states to provide necessities for human security. One of the most significant effects is on the migration dimension of human security. This research revolves around the climate-induced migration aspect of human security in Pakistan's South Punjab region after the 2022 floods. The research has also incorporated the patterns of migration in Pakistan generally and in South Punjab particularly. The reasons behind the temporary or permanent migration of people from RajanPur and Taunsa Sharif are also discussed in detail and analyzed through the survey conducted among the flood victims of these areas

To understand the relation among climate change, human security and climate induced migration it is pertinent to be aware of the values of these concepts.

Climate Change

Climate change is an extensive concept and has been explained in various terminologies. In simple words, climate change can be described as,

"a shift in average weather conditions, including measures such as temperature, humidity, rainfall, cloudiness and wind patterns and changes in the frequency or severity of these conditions." (U.K. Climate Assembly)

The planet's climate has been changing throughout history in cycles, which have been occurring over long periods, and this is a natural process. However, there has been a rapid climate change that has emerged over the past 50 years. There is scientific evidence that these changes have not been driven by the natural climate cycles; instead, these are because of global warming and human activities.

Human security

Human security has been defined in various contexts. In climate change, human security is "a condition that exists when the vital core of human lives is protected and when people have the freedom and capacity to live with dignity." (Adger et al., 2014). Human security can be considered inclusive of socio-cultural, political, and economic rights and does not confine to the legal rights of an individual (C.H.S., 2003).

Further discussion would be based on the argument that climate change impacts and breaches the fundamental human rights to life, shelter, food, and security.

Literature Review

Climate change and human security

At present, there is a widespread argument that the current changes in the climate of the Earth's system have no prior link to the history of human civilization (IPCC, 2007). Climate change poses significant risks to human security, ranging from coastal erosion, soil moisture, decreased precipitation, increased storm intensity, and species migration (McCarthy et al., 2001). The impacts of climate change around the world can be through both the changes in mean conditions, including temperature, sea level, or precipitation over a more extended period, and secondly through a rapid increase in the intensity and frequency of droughts, storms, floods, cyclones, epidemics, and heatwaves. Apart from these long and short-term changes, some other high-impact changes are at risk. Such events or changes include the melting of glaciers which can lead to high sea levels and can also cause a collapse of the thermohaline circulation which can lead to significant climate changes in the northern hemisphere and a shift in significant monsoon season in Asia and the El Nino Southern Oscillation phenomenon (Oppenheimer & Alley, 2004; Vellinga & Wood, 2007; Schneider et al., 2007).

The climate change over the past 10 years is unprecedented, and the climatic variations have significantly triggered social disruptions. The El Nino events and famines have been documented to have killed millions of people across the tropics in the 19th century (Davis, 2001). The famine is said to have been triggered by the drought yet was caused by the economic and political colonization that deprived the people of natural resources. The famines have been analyzed because of poverty, inequality, and market and policy failures instead of being disguised as natural disasters.

The vulnerability of people towards climate change depends on the extent to which they rely on natural resources and ecosystem services; the extent to which they are dependent upon these resources is often sensitive to climate change and, thus, their ability to adapt to these changes in the services and resources. Thus, it means that the more people are dependent on the forms of climate-sensitive capital and less on the economic and social forms of capital, the more they are prone to the risk of climate change.

However, not only do environmental changes undermine human security, but various social factors also play an essential role in poverty, degree of discrimination or support from the states, accessible economic opportunities, effectiveness of decision-making, and social cohesion within the communities.

Even though the individual is the central focus of human security, the processes that strengthen or undermine human security can often be external to the people's community. Regarding environmental change, several actors and processes are to influence the security of individuals entitled to natural resources. Some of them include atmospheric polluters, mining and logging companies, and regional-scale climatic processes. On the other hand, if we consider the social determinants, they include warfare, corruption, macroeconomic policies, trade dependency, and globalization processes, which, in short, shape the economic and social entitlements that impact an individual's vulnerability. The processes that shape an individual's entitlements to social, economic, and natural capital can be vulnerable to climate change (Barnett & Adger, 2007).

In sum, climate change has threatened human security by undermining livelihoods, compromising cultural and individual identities, increasing migrations that otherwise could have been avoided, and, lastly, undermining and challenging the capabilities of the states to provide the primary conditions for human security. It is plausible for climate change to influence all these factors simultaneously, and the interaction of these factors can cause extreme insecurity, such as conflicts, famine, and socio-political instability. For most of the populations around the world, mainly belonging to the developing states, being socially marginalized and resource-dependent, and a simple change in climate would progressively undermine human security.

Climate induced migrations (An Overview)

Climate change has had adverse impacts on human security, and also a significant impact on the migration dimension of human security. Climate-induced migration can be referred to as "the movement of a person or group of persons who, predominantly for reasons either sudden or progressive change in the environment due to climate change, are obliged to leave their habitual place of residence, or to do so, either temporarily or permanently, within a state or across an international border." (I.O.M., 2019). Temporal or spatial characteristics, i.e., can define migration; it is either a permanent or a semi-permanent movement by a person (Brown & Bean, 2005). These sorts of migrations have been prevalent all over the world and can be derived from various imperatives. It has been observed that during the past few decades, extreme weather events have displaced the populations for a shorter term because they lost their residence and had economic disruptions—only a significant proportion of displacement results in permanent migration (Foresight, 2011). The displacements due to weather events are usually temporary, and people tend to return to their original residence and area after its rebuild.

The 2010 floods in Pakistan caused only a localized displacement over a wide area rather than a long-distance migration (Gaurav et al., 2011). The only thing that can determine the shift from a temporary displacement to a permanent migration is the structural economic cause of the vulnerability. For example, when Hurricane Katrina hit New Orleans in 2005, the economically devastated population was displaced and did not return (Myers et al., 2008). The displacement has also affected human security through

various things such as housing, economic and health outcomes (Adams et al., 2009) along with causing well-documented gender differences in displacement where women mainly lost their social capital and were affected by adverse kinds of mental health outcomes (Hunter & David, 2011). The long-term climatic change, rise in sea level, coastal erosion, and the decrease in agricultural productivity significantly impact migration flow (Lilleor & Van den Broeck, 2011).

Populations all over the world are vulnerable to the impacts of climate change. A region-wise discussion of climate-induced migration is done below:

The African Sahel

This region stretches across Africa, particularly from Ethiopia to Senegal, and climate-induced migration has become a prominent issue within this region. Most people have been facing food insecurities and unpredictable weather events, so people have been leaving for the urban centers of Africa. This migration has led to potential conflicts with the previously existing populations over space and other necessities (Henderson et al., 2017). On the other hand, some people have been resorting towards a dangerous migration across the Sahara and Mediterranean, hoping that they would make it to Europe. Such a migration route can be characterized by dangerous conflicts with the governments and residents and hazards during the travel across the ocean and desert (Parenti, 2011). Even after migration, they would face the problems of intense political tension, discrimination, and violence.

Middle East and North African Region

According to the climate models, it is estimated that 2050 temperatures in the region will drop to the 90th percentile, and the hottest temperatures will exceed about 100 degrees Fahrenheit (Lelieveld, 2016). It has also been suggested that the heat stress over the soil would be able to desiccate organic life. Moreover, the climate change has led to a civil strife in Syria. A prolonged drought in the East and North-East can be linked to the farmers forced by climate change to abandon their livelihood land and migrate to the cities West of Syria. About one million people migrated from rural to urban areas from 2010-2011 (Gleick, 2014).

Central America

Central America faced drastic climate change and experienced drought, livelihood collapse, discord, and distressed migration (Wernick, 2019). Since 2009, the "dry corridor" of Nicaragua, Honduras, El Salvador, and Guatemala has been experiencing devastating multi-year droughts. The Food and Agricultural Organization (F.A.O.) of the United Nations has asserted that the loss of crops from 2006 to 2016 reached 50% to 90% and left people on humanitarian aid (F.A.O., 2016). Most of the population needs more income to buy food (W.F.P., 2019). People have chosen to migrate due to the uncertain future rainfall, thus increasing emigration from the region to 500% from 2010 until 2015. The majority of the people have moved Northwards in order to seek better prospects for themselves. This migration resulted in an increased conflict among the migrants and the authorities.

South Asia

Climate change has also had a great impact on the South Asian region. The 2017 Representative Concentration Pathway (R.C.P.) model has asserted that an extreme wet-bulb temperature would be expected to exceed up to 35 degrees Celsius, considered the highest limit for human survivability. Moreover, Bangladesh has to face the impacts of rising sea levels and coastal flooding. In recent years, extreme heat waves have been experienced in South Asia, including the fifth deadliest heat wave in 2015 in Pakistan, which killed almost 3500 people. The 2018 World Bank Report propounded that by 2050, South Asia will see

about 11-22 million climate migrants due to urgent climate mitigation (Rigaud, 2018). Most of the population is dependent upon rain-fed agriculture and summer monsoons, which makes it vulnerable to any change in temperature or rainfall.

Pakistan: A Back Ground

Among the South Asian countries, Pakistan has been severely impacted by climate change, and the significant impact is on climate-induced migration. A number of studies have shown that more than 18 million people were forced to migrate because of climate change. Climate scientists have asserted that temperature will increase from 3 to 6 degrees in Pakistan at the end of this century. The maximum temperature rise is to be expected in the Northern areas, Southern K.P.K., and the Central and Southern Punjab. Sindh and Baluchistan are to face extreme heat stress and droughts.

The Global Climate Risk Index claimed that Pakistan is one of the ten countries the most vulnerable to climate change. In the 2020 list, it was ranked fifth (Eckstein, 2022). All the regions of Pakistan have been facing climate-induced migrations. Climate change is expected to cause 1 billion people to migrate by 2050. Heat waves, droughts, floods, and rising sea levels have significantly affected communities and forced people to migrate. However, these migrations have led to the challenges of space and resources, aggravating inequality, which made them vulnerable to climate change in the very first place (Joles, 2022). Most of the displacements due to floods were relocated to areas that lacked adequate food and shelter. Most male members of the families migrated to the urban areas in search of job opportunities. Most of the people are migrating to the urban areas and targeting the major cities so that they can fulfill their economic needs. The patterns of coerced displacement and migration are evident throughout Pakistan. The K.P.K. and Gilgit Baltistan residents usually migrate seasonally or sometimes permanently due to the Glacial Lake Outburst Floods (GLOF).

Permanent climate-induced migration in Pakistan

Extreme weather events such as increased floods, rising temperatures, rising sea levels, and changes in precipitation patterns have profoundly impacted the livelihood of individuals, compelling them to migrate. Permanent climate-induced migration is a pressing issue in Pakistan, and an amalgamation of environmental factors has driven it. In the last few years, people have permanently migrated from their areas to more significant and more sustainable areas, particularly the major cities of Pakistan. Forced climate-induced migration and displacement have been evident in each province of Pakistan. However, the people of K.P.K. and Gilgit Baltistan often migrate permanently due to Glacial Lake Outburst Floods (GLOF) and riverine flooding. The most apparent example of such flooding was the floods of 2010, where almost 20 million people were displaced. Moreover, in 2012, the monsoon flooding affected about 4.5 million people in Sindh and Baluchistan.

About 50% of Pakistan's population has become vulnerable to the change in climate patterns. It has been observed that the population of Islamabad has increased from 500,000 to more than 2.2 million since 2010. On the other hand, Karachi has welcomed about 30 million climate migrants in the last few years. Moreover, the issue of sea erosion in the Indus River delta islands has affected three significant districts of Sindh i.e. Thatta, Badin, and Sajawal districts, and the local communities had to migrate to Karachi (Latif, 2019).

The primary reasons behind permanent climate-induced migration are:

Rise in sea-level

The coastal areas of Pakistan, such as the provinces of Baluchistan and Sindh, have been vulnerable to sea-level rise after climate change. The rise in sea levels causes coastal

erosion, an increase in flooding, and saltwater intrusion. The people belonging to these areas were compelled to migrate towards inland locations.

Glacial melt and water security

Due to the receding of glaciers because of high temperatures, there has been a need for freshwater availability, particularly in the Indus River basin. This scarcity would have a destructive impact on agriculture, making the people migrate to regions with reliable water sources.

Agricultural shifts

Pakistan is an agrarian state, and the changing precipitation patterns have made certain areas unsuitable for agriculture. As agricultural productivity declined, the farming community migrated permanently to a place with more viable agricultural areas or other employment opportunities.

Temporary climate induced migrations

The temporary climate-induced migration in Pakistan is usually during the monsoon season, often called the "kharif" or "catchment" season. Most of the people move during this season due to the climatic conditions. People have relied on seasonal or circular migrations for many years to survive. Most of these people belonged to the rural agricultural background that migrate for employment purposes and usually return in the crop production season. However, during the past few years, drastic climate change disrupted this system, forcing the communities to permanent migrations. Thus, it can be inferred that recent climate change has turned seasonal migrations into long-term migrations.

The primary reasons behind this temporary migration are:

Flooding concerns

The monsoon season in Pakistan often results in a riverine and flash floods. In flood-prone areas, such as the Sindh and Punjab plains, the people from these areas migrate to the higher grounds for safety.

Crop losses

Excessive rainfall causes crop damage and affects the farming communities. These communities tend to migrate temporarily for this season to find an alternative source of income.

While temporary migration during the catchment season has some advantages, there are some challenges and specific challenges, such as overcrowded urban areas, competition for employment opportunities, and the strain on social services.

The table below gives a general insight of climate-induced migration in Pakistan and how internal migrants have been migrating from one area to another over the past few years.

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

Source: Computed by the authors from PDHS 2017–18 microdata.

The table above shows the data on the direction of population move by provinces and the agroecological zone. About two-thirds of the internal economic migrants moved from the rural to urban areas, and this sort of movement was most significant in Khyber Pakhtunkhwa, FATA, Gilgit-Baltistan Azad Jammu, and Kashmir. Moreover, about one-fifth of the migrants moved within the urban areas, and almost 16% of them sorted migration from one rural area to another rural area. However, migration from an urban area to a rural one has been rare, i.e., 3.7% (Arif&Sadiq, 2019). Thus, it can be inferred that most migrations occurred from rural to urban centers, and this pattern has also been prominent in the agroecological zones.

The following section is based on the case under discussion, the two prominent flood affected areas of Southern Punjab where people migrated towards urban centers. The research tried to highlight the problems of host areas and the migrators through survey research methods.

Case Study: Taunsa Sharif And Rajanpur Floods 2022

Taunsa Sharif

Taunsa sharif was declared a district in 2020. It comprises thirteen union councils and three tehsils come under the Taunsa district.

According to the Pakistan Bureau of Statistics (PBS), the Taunsa Tehsil has a total population of 677,785. The rural area comprises 580 592 people, of which 300,077 are male and 280,483 are female. The population in the urban areas is 97,913, out of which 50,363 are male and 46,828 are female. The whole district acquires about 2,769 Square Kilometers (PBS, 2017).

Rivers

The district has several rivers and canals for irrigation purposes. Some of the major canals and rivers include:

- Indus River: It is one of the major rivers of Pakistan and flows near Taunsa
- Taunsa Barrage: It is an essential structure in Taunsa over the Indus River and diverts water into various canals for irrigation purposes.
- DG Khan Canal
- Taunsa-Panjnad Link Canal: The canal links the Panjnad and Indus rivers to act as a significant channel for water distribution in the region.
- Panjnad River was formed by the confluence of five rivers, mainly Chenab and Sutlej.

As the district is linked with significant canals and rivers, there has always been a constant threat of water overflow. Due to the rapid climate change and an increase in the rains during monsoon season, the canals overflowed and resulted in drastic damage to the infrastructure and agriculture of the district. The villages were majorly affected by the River flood and hill-torrent flood.

The major source of income

The primary sources of income for people in Taunsa include:

- **Agriculture:** It can be considered the backbone of the economy in the district. The region has fertile land for cultivating crops such as wheat, rice, sugarcane, maize, and cotton.
- **Fishing:** As the Indus River and its canals are present in the region, fishing has been a significant source of income for some communities.
- **Livestock and dairy farming:** Most residents have been engaged in livestock farming, including dairy farming, poultry, and rearing cattle.

All these significant sources of income have been compromised during the 2022 floods as they destroyed all the crops and lands. Moreover, a large number of animals drowned in the water, depriving people of their livelihoods. Most people had to leave their farms and animals behind to migrate and settle for survival during the difficult situation. This migration made people economically vulnerable and left people empty-handed.

Rajanpur

District Rajanpur is the Southern-most district of Punjab, established in 1982. It comprises five tehsils, i.e., Rajanpur, Fazilpur, Kot-Mithan, Jampur, and Rojhan, and 69 union councils.

According to the Pakistan Bureau of Statistics (PBS), the Rajanpur district has a population of 1,996,039. The rural area comprises 1,658,743 people, of which 855,496 are male and 803,097 are female. The urban area comprises 337,296 people, of which 172,668 are male and 164,571 are female. Rajanpur district is based on 12,318 Square Kilometers (PBS, 2017).

Rivers

River Indus is considered a transboundary river of Asia and the trans-Himalayan river of South Asia. Indus covers 180 km of District Rajanpur and enters Sindh through the district. The river on the east of Rajanpur begins to rise when the snow in the Himalayas melts in May, and its beds are filled, reaching the breadth of about 15 to 20 kilometers in the

summer season. The eastern part of the district, i.e., Kacha Zone, is closest to the riverbed; thus, it is often vulnerable to floods from the Indus River in the monsoon season in July and August. The riverine flooding usually hits the low-lying areas of the district, which are closer to the river belt of the Jampur, Rajanpur, and Rojhan tehsils.

According to the National Weather Forecasting Center report, the Pakistan Meteorological Department recorded an average rainfall of 293 mm in Rajanpur district during 2022, which is higher than the previous five years. Incessant rains in the Koh-e-Suleman catchment area caused exceptionally high flooding in the district, affecting about 80% of the area and 60 % of the population. In addition, in August 2022, two major Hill torrents, Kaha and Chachar, released about 184,841 cusecs of torrential water.

The major source of income

The primary source of income of the residents of Rajanpur district include:

- **Agriculture:** Most of the people of the district earn through the agricultural sector.
- **Seasonal crops:** Rajanpur has been declared one of Pakistan's best cotton-growing districts. Other crops famous in the district include wheat, rice, sugarcane, gram, and sesame.
- **Livestock:** The district's residents own various animal farms and earn through dairy and poultry farming.
- **Labor work:** People usually hire laborers on a daily wage basis to work on farms and in the agricultural fields.

The heavy rains during the monsoon season always threaten the district's crops and agriculture. In addition, a flash flood is another hazard that develops from the mountain ranges of Koh-e-Sulaiman, present on the west side of Rajanpur. The crops permanently get damaged in the flash flood and riverine areas. As agriculture is the primary source of income for farmers and farm laborers, the hazards affect the business in the Rajanpur district.

Methodology

The recent floods of 2022 affected 33 million people in Pakistan, and all four provinces of Pakistan were severely affected. This research has its focus on the mentioned areas of South Punjab. Water levels in the River Indus at Kot-Mithan (Rajanpur) have risen due to the heavy rainfall in Northern areas of Pakistan. This immediate rise in the Indus River during mid-July damaged the livelihood of riverine areas of Rajanpur. Approximately 7,20,000 cusecs discharged from Taunsa, Panjnad, and RodhKohi Channels were reported at the Benazir Bridge. All five rivers of Pakistan joined at KotMithan in the Rajanpur district, and this caused a massive increase in pressure on the areas of Rajanpur.

Moreover, the flash flood from the Koh-e-Suleman range of mountains on the western side of Rajanpur proved to be hazardous during the rainfall of 2022. This developed a comparatively high-level flash flood in the Pachadh Areas of Rajanpur. Due to this high-level flash flood, the Western and Eastern parts of the district were highly affected.

Taunsa district was also the most hit region in South Punjab. Over half of the area was submerged and lacked safe water and food. Emergency was imposed across the district, and the village residents adjoining the rain-fed rivers were evacuated; people were forced to leave to safe shelter places after the roads and link bridges were washed away.

To get the hands on information that how the flood forced people for temporary migration, how human security be at risk and to what extent people are satisfied with the government's counter actions to address the issue. A short survey has been designed and

conducted in the major affected areas of Rajanpur and Taunsa Sharif. Most of the people in the areas were reluctant to answer the questions, so only 65 majorly affected respondents from Rajanpur and 100 from Taunsa Sharif helped in conducting the survey. For creating symmetrical results 65 responses from both the regions used for analysis. The survey questions were translated in to the local language that is Saraiki, lately all the responses were translated into English language.

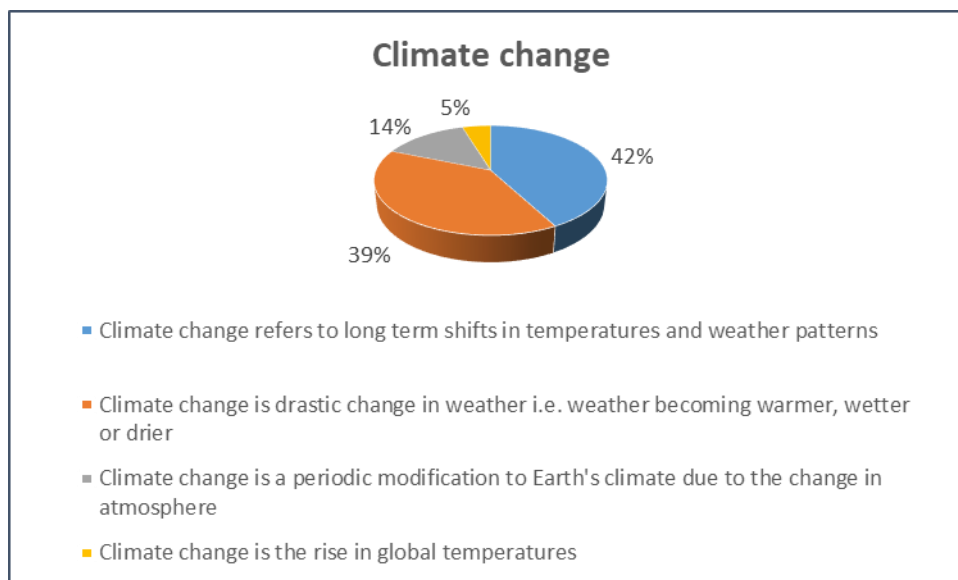
Discussion and Analysis

This section pertains to 10 survey questions framed from assessing the responses of 65 respondents. The questions are analyzed under three major themes, i.e., awareness of climate change, climate-induced migration, and government response to the 2022 floods.

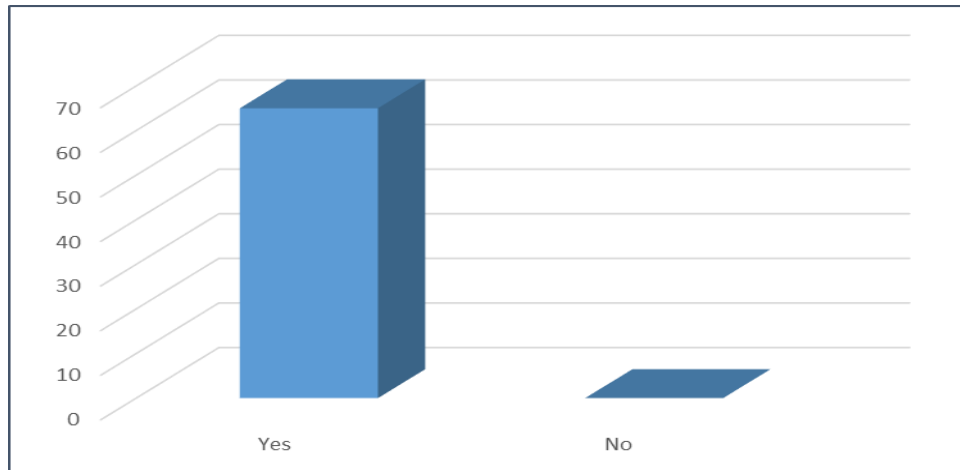
Awareness of climate change

Awareness of the climate change is of paramount importance all over the world. It is a global crisis and has far-reaching impacts on the environment, economies, and societies. Awareness of the climate change is a foundational step to address this issue. This awareness catalyzes in order to develop policies and global cooperation, which is necessary to reduce its impacts.

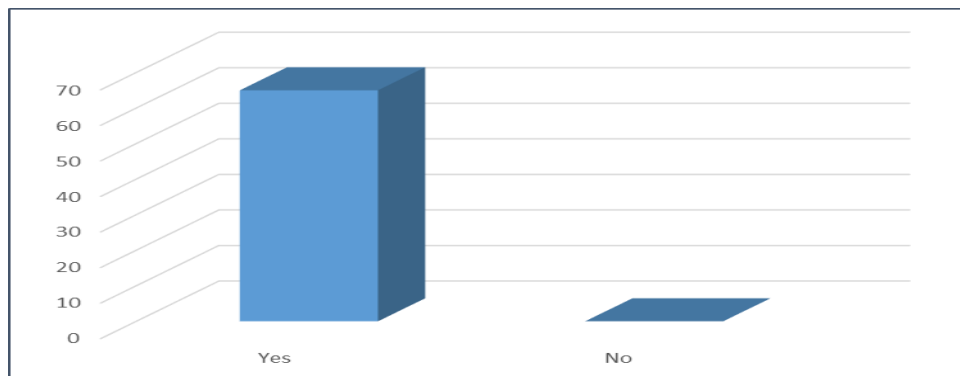
The first question under this theme was how do you define the concept of climate change? Around 42% of the people referred to climate change as the long-term shifts in temperature and weather patterns. Whereas 39% of people think climate change is a drastic change in weather, i.e., weather becoming warmer, wetter, or drier. Moreover, about 14% of people have referred to climate change as a periodic modification to Earth's climate due to changes in the atmosphere. Lastly, about 5% of the population considers climate change to be rising global temperatures.



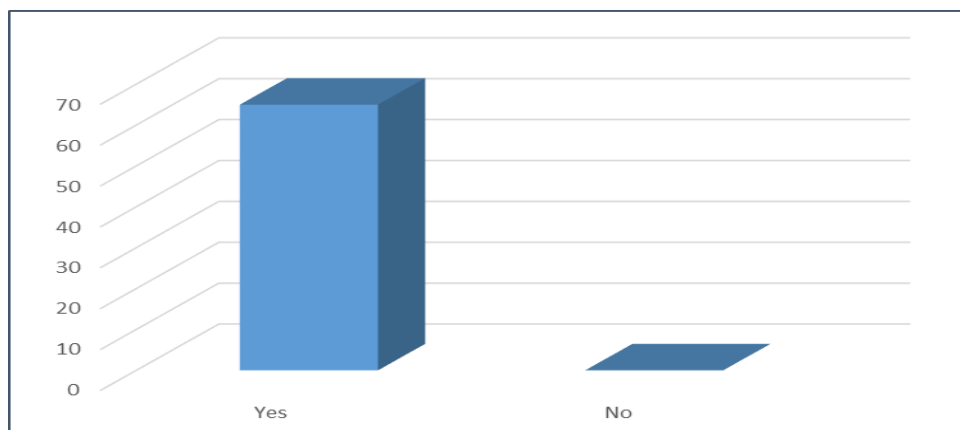
The second question under this theme was, do you believe climate change has contributed to the frequency and intensity of floods in the region? All 65 respondents agreed that climate change has contributed to increased floods in the region, and neither disagreed.



The third question under this theme was: Did the 2022 floods affect local infrastructure, livelihoods, and access to essential services like water and healthcare? To this question, all 65 respondents agreed that the 2022 floods destroyed and greatly affected the local infrastructure and deprived people of necessities.



The last question under this theme was, were any casualties reported in your community due to the floods? All 65 respondents agreed that the 2022 floods left their community destroyed, and many people died due to this disaster. No one disagreed to the question.

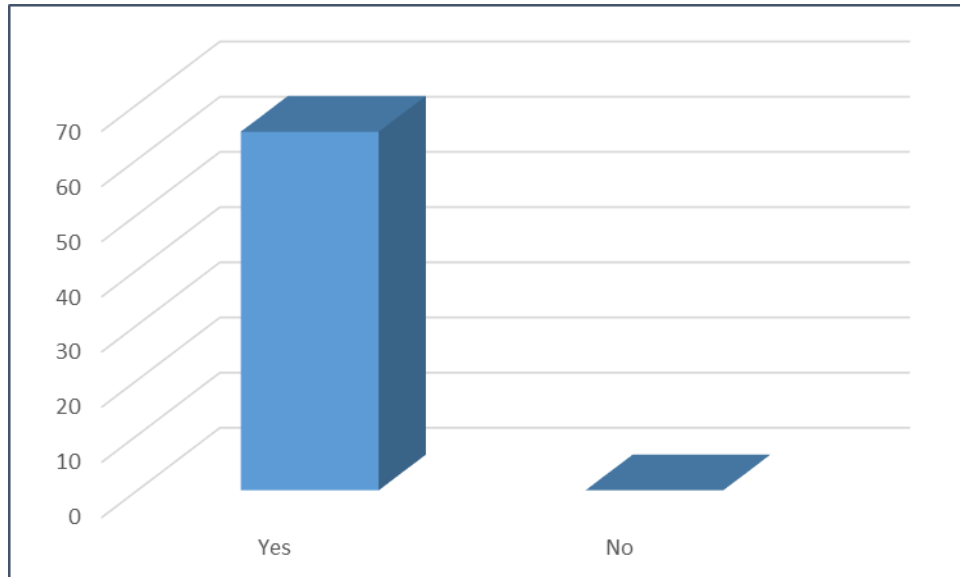


Climate induced migration

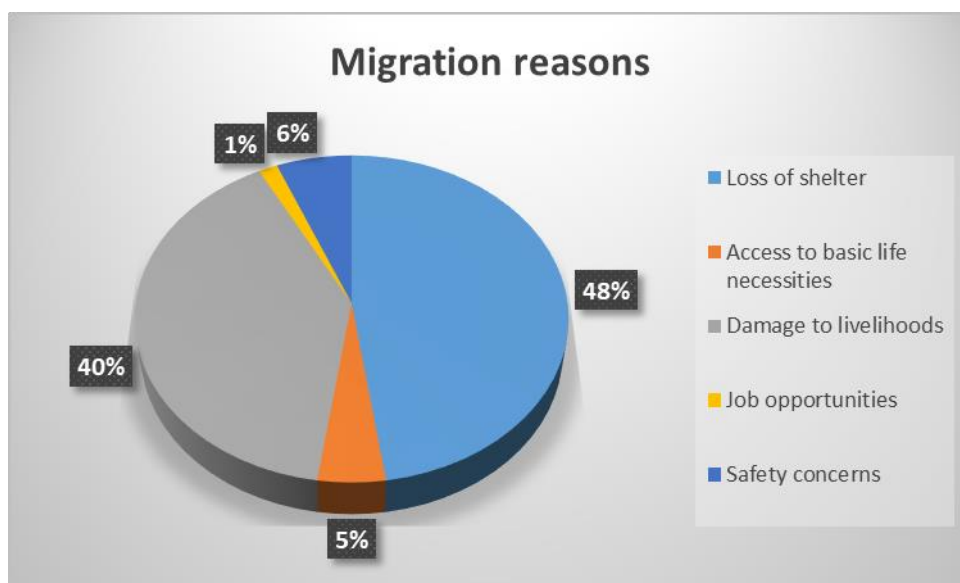
Climate change has had adverse impacts on human security, and its significant impact was on the migration dimension of human security. Climate change has severely affected Pakistan, and the significant impact has been climate-induced migration.

Particularly after the recent floods of 2022, people from the affected areas have been forced to migrate to other regions to survive and get the necessities of life.

The first question under this theme was, have you or anyone you know considered migrating to another area due to the 2022 floods? While answering this question, all 65 respondents strongly agreed, and neither denied that these floods forced people to migrate from their hometowns.

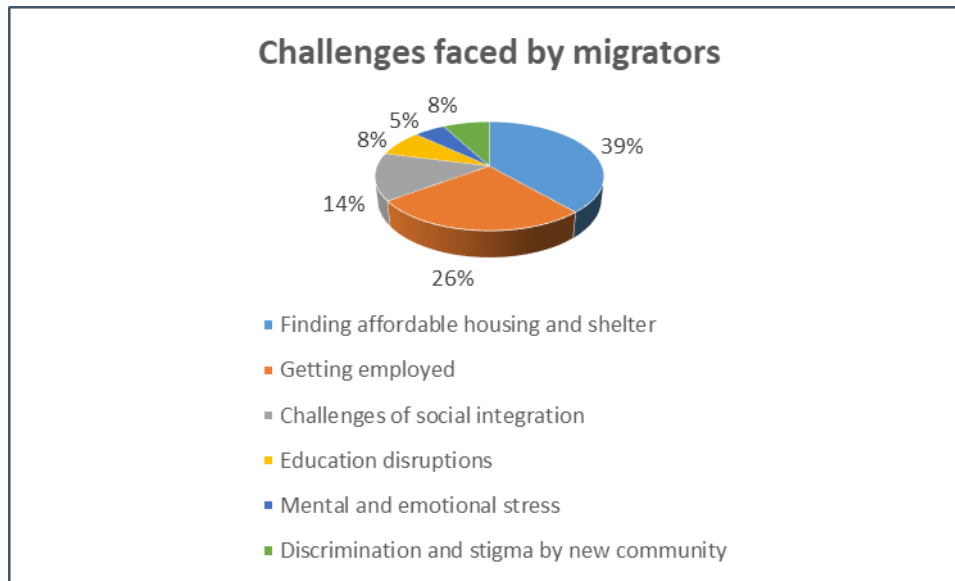


The second question under this theme was what were the primary reasons to migrate? About 48% of people mentioned the loss of shelter as the significant reason behind migration. In contrast, 40 % of the people considered damage to their livelihoods as the significant reason behind migration. In addition, 6% of people consider safety concerns, 5% consider access to basic life necessities, and 1% consider job opportunities to be the primary reason behind the migration from flood-affected areas to other regions.



The last question under this theme was, what challenges did the migrators face? About 39% of the respondents considered finding affordable housing and shelter as the significant challenge faced by the migrants. However, 26% considered getting employed, 14% considered challenges of social integration, 8% considered education disruptions, 8%

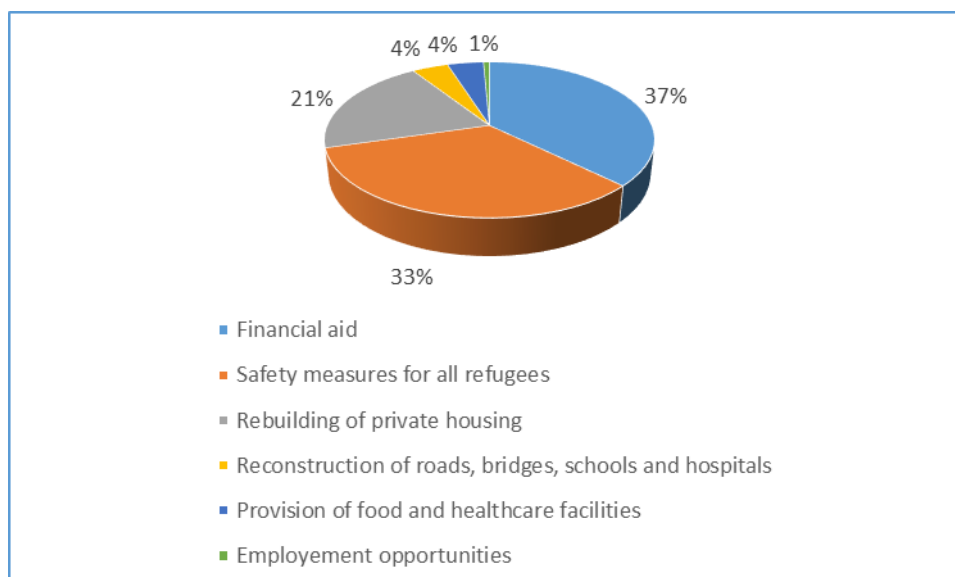
considered discrimination by the new community, and 5% considered mental and emotional distress as the significant challenges faced by the migrants after the 2022 floods.



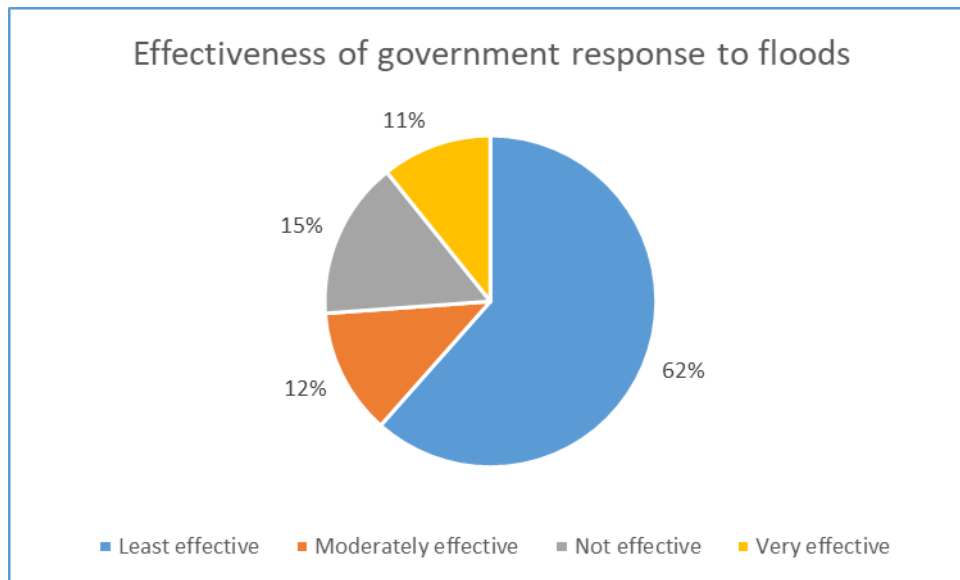
Government responses

After the 2022 floods, one-third of the country was submerged in water. About 15,000 people died or were injured, and about 8 million people were displaced. About 2 million homes, 439 bridges, and 13,000 kilometers of highway were destroyed. In addition to this, about 4 million acres of agricultural land were damaged (Nabi, 2023). The immediate response of the government was to give relief to the refugees. Funds up to \$816 million were raised to help the refugees through international funding. The coalition government tried to overcome the damage caused by the floods, but the population has yet to be satisfied.

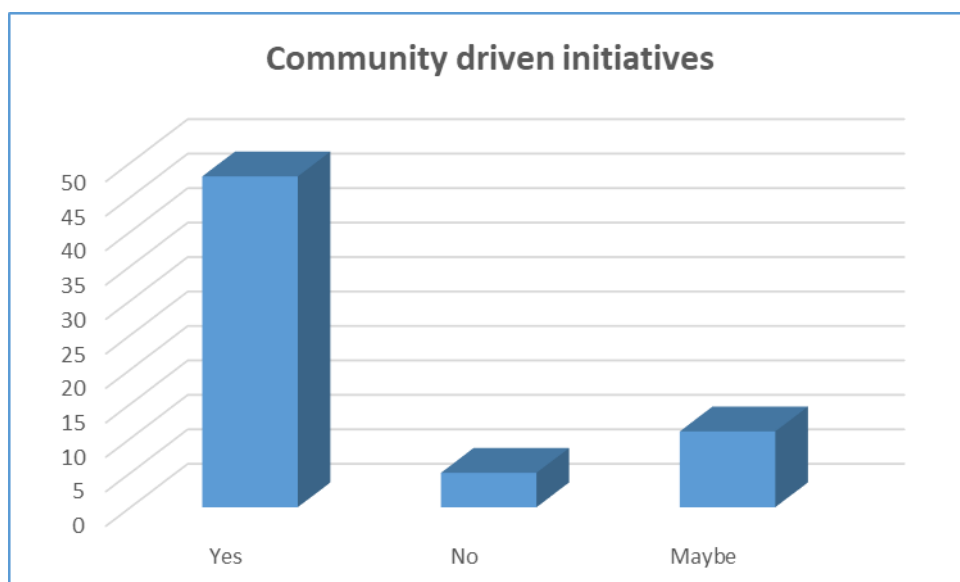
The first question under this theme was, what kind of policies and help did flood refugees expect the government to provide? While answering this question, 37% of the respondents pointed out financial aid as the most expected help from the government. Other 33% mentioned safety measures for all refugees, 21% considered rebuilding private housing, 4% considered reconstruction of local infrastructure, 4% considered the provision of food and healthcare facilities, and 1% mentioned employment opportunities to be the most expected help from the government after 2022 floods caused havoc in the region.



The second question under this theme was, how effective do you think the government's response was in providing relief and support after the floods? Out of the 65 respondents, about 62% of the people considered the government's response in providing relief and support after the 2022 floods as least effective. While 15% considered it ineffective, 12% considered it moderately effective, and 11% considered the government's response very effective.



The last question under this theme was, were there any community-driven initiatives to address the impacts of the floods and promote resilience? In response to this question, out of 65 respondents, 48 agreed that there were community-driven initiatives, while 11 people answered as may be, and five disagreed.



Conclusion

Climate change and climate-induced migration have represented a multifaceted threat to human security in Pakistan. As the temperature rises, extreme weather events become frequent, and the water resources become scarce, pushing the vulnerable communities to the brink. This environmental stress eventually exacerbates society's social,

economic, and political challenges and leads to conflicts, displacement, and a decline in the well-being of the concerned population. In order to safeguard human security in Pakistan, a comprehensive approach is imperative. This approach includes mitigation and adaptation measures to counter the challenges posed by climate change and address the needs of people who had to migrate because of its impacts. 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.

Suggestions

Climate change and climate-induced migration have posed significant challenges for Pakistan. Here are some suggestions to address and lessen the impacts of floods due to climate change in Pakistan.

- **Energy efficiency:** Energy efficiency should be promoted to help with flood mitigation by reducing greenhouse gas emissions, exacerbating the weather patterns, and raising the risks of increased floods.
- **Water resource management:** An adequately managed system for water resources can help to control and reduce the risks of floods. Building dams, reservoirs, and levees can reduce the severity of flooding due to heavy monsoon seasons. Moreover, the flood refugees demand that the reservoirs and levees, damaged due to the 2022 floods, be reconstructed to avoid future damages.
- **Floodplain zoning and urban planning:** The floodplains need to be developed, and strict zoning regulations must be implemented to prevent any construction. This would reduce the economic and human toll of floods.
- **Advanced early warning system:** An advanced early warning system needs to be implemented to keep the communities aware of information about impending floods so that they can evacuate on time.
- **Reconstruction of local infrastructure:** The 2022 floods left the local infrastructure severely damaged, including schools, hospitals, roads, bridges, and houses. The residents have been demanding that the government help them reconstruct the local infrastructure so that the communities can return to their everyday lives.

References

- Adger, W., Pulhin, J., Barnett, J., Dabelko, G., Hovelsrud, G., Levy, M., Vogel, H. (2014). *Human Security*. Cambridge University Press.
- Arif, G., &Sadiq, M. (2019). Climate change and migration as adaptation in Pakistan: Preliminary findings. In G. Arif, M. Riaz, N. Faisal, & K. Khattak, *Climate, population and vulnerability in Pakistan: Exploring evidence of linkages for adaptation* (pp. 61-75).
- Barnett, J., &Adger, N. (2007). Climate change, human security, and violent conflict. *Political Geography*, pp. 639–655.
- Brown, S. and F. Bean, (2005). International migration. In: *Handbook of Population* [Poston, D.L. and M. Micklin (eds.)]. Kluwer, Dordrecht, Netherlands, pp. 347-382.
- Commission on Human Security, (2003) *Human Security Now: Protecting and Empowering People*. Commission on Human Security (C.H.S.), Human Security Unit, United Nations Office for the Coordination of Humanitarian Affairs (OCHA), New York, NY, U.S.A
- Davis, M. (2001). *Late Victorian holocausts: El Niño, famines, and the making of the third world*. New York: Verso.
- Food and Agricultural Organization of the United Nations.(2016). *Dry Corridor in Central America, Situation Report*. Food and Agriculture Organization of the United Nations.
- Foresight,(2011). *Migration and Global Environmental Change: Future Challenges and Opportunities. Final Project Report, U.K. Government Office for Science*, London, UK, 236 pp
- Gaurav, K., R. Sinha, and P. Panda, (2011). The Indus flood of 2010 in Pakistan: A perspective analysis using remote sensing data. *Natural Hazards*, 59(3), 1815-1826.
- Gleick PH.(2014) *Water, drought, climate change, and conflict in Syria*. Weather, Climate, and Society. 2014; 6, pp-331–40
- Henderson JV, Storeygard A, Deichmann U.(2017) *Has climate change driven urbanization in Africa? J Dev Econ. 2017;124: pp,60–82*
- Hunter, L.M. and E. David, (2011). *Displacement, climate change, and gender*. In: *Migration and Climate Change*. [Piguet, É., A. Pécout, and P.d.Guchteneire (eds.)].United Nations Educational, Scientific and Cultural Organization (UNESCO), Cambridge University Press, Cambridge, UK and NewYork, NY, U.S.A., pp. 306-330
- IPCC (Intergovernmental Panel on Climate Change). (2007). *Climate Change 2007: Synthesis report*. Contribution of Working Groups I, II, and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge: Cambridge University Press
- Lelieveld J. (2016) Strongly increasing heat extremes in the Middle East and North Africa (MENA) in the 21st century. *Climate Chang. 2016;137*, pp-245–60. Provides regional forecasts of rapidly warming climate in the MENA region
- Lilleør, H.B., and K. Van den Broeck, (2011). Economic drivers of migration and climate change in L.D.C.s. *Global Environmental Change: Human and Policy Dimensions*, 21(Suppl. 1), S70-S81.

- McCarthy, J., Canziani, O., Leary, N., Dokken, D., & White, K. (2001). *Climate change 2001: Impacts, adaptation, and vulnerability*. Cambridge: Cambridge University Press.
- Myers, C.A., T. Slack, and J. Singelmann, (2008). Social vulnerability and migration in the wake of disaster: the case of Hurricanes Katrina and Rita. *Population and Environment*, 29(6), pp-271-291
- Nabi, I. (2023, February 10). *Responding to Pakistan floods*. Retrieved from Brookings: <https://www.brookings.edu/articles/pakistan-floods/>
- Oppenheimer, M., & Alley, R. (2004). The West Antarctic ice sheet and long-term climate policy. *Climatic change*, 64, p.10.
- Parenti C.(2011). *Tropic of chaos: Climate change and the new geography of violence*. New York: Nation Books; 2011
- Rigaud KK, de Sherbinin A, Jones B, Bergmann J, Clement V, Ober K, et al.(2018). *Groundswell: Preparing for internal climate migration*: World Bank; 2018. <https://doi.org/10.1596/29461>.
- Schneider, S., Semenov, S., & Patwardhan, A. (2007). Assessing key vulnerabilities and the risk from climate change. Contribution of Working Group 2 to IPCC. In M. Parry, O. Canziani, & J. Palutikof (Eds.), *Climate Change 2007: Impacts adaptation and vulnerability*. Cambridge: Cambridge University Press.
- Vellinga, M., & Wood, R. (2007). Impacts of thermohaline circulation shutdown in the twenty-first century. *Climatic Change*, 91. 43-63
- Wernick A.(2019). *Climate change is the overlooked driver of Central American migration*. In Public Radio International: The World /Living on Earth. 2019. Boston; 2019.
- World Food Program(2019). Erratic weather patterns in the Central American Dry Corridor leave 1.4 million people in urgent need of food assistance. *WEF, Report*