



# Spatial Migration Resulting from Climate Change and Environmental Hazards: a review article

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**Abstract:** Migration is a contemporary environmental issue linked to climate change. Several phenomena, including drought, desertification, and water scarcity, contribute to increased spatial displacement, forcing millions of people to leave their homes in search of more stable environments. This study explores the relationship between climate change, environmental risks, and spatial displacement by identifying the factors influencing this increase. The study employs an analytical review methodology, examining studies related to climate change and migration, and drawing upon international sources and reports specializing in spatial displacement. The study demonstrates that climate change is a major driver of increased spatial displacement, leading to a decline in economic and social stability, particularly in arid and semi-arid environments, which are more vulnerable to environmental risks. According to data from the Internal Displacement Monitoring Centre, climate change, including drought, desertification, water scarcity, floods, and fires, caused the displacement of 45.8 million people by 2024. Armed conflicts, on the other hand, caused the displacement of 20.1 million people by the same year. The study concluded that addressing climate-related migration requires strategies that promote adaptation to climatic conditions to reduce the effects of desertification, drought and water scarcity, thereby contributing to environmental and social stability.

**Keywords:** Climate change, desertification and drought, spatial migration.

## I. Introduction

Spatial migration became more pronounced in the 1970s with the melting of snow, particularly in coastal areas. Climate change is a global challenge, especially in arid regions, due to the increasing frequency of extreme weather events such as droughts, heat waves, and wildfires. (Bellizzi, 2025) In light of these transformations, spatial migration has become one of the most prominent human responses to climate change and the environmental risks associated with it, as climate change represents an increasingly influential structural driver in spatial migration patterns through the environmental risks it leaves behind, represented by the deterioration of agricultural lands, water scarcity, and the decline in agricultural production. These factors do not operate in isolation from social, economic, and political contexts, but rather they overlap to form spatially and temporally diverse migration patterns. (Piguet, 2022) These events may lead to population displacement due to damage to or loss of land and property, highlighting the importance of this change as a decisive factor in migration decisions. It is estimated that by 2050, one billion people will be at risk from climate change. (Burrows and Kinney, 2016) The research problem stems from the increasing scale of internal and external displacement linked to climatic factors and security problems resulting from wars. All these factors have driven populations to leave their original areas in search of more stable living conditions, leading to profound demographic shifts that may result in spatial imbalances. The importance of this research lies in its highlighting of a pivotal issue in our contemporary world with humanitarian, developmental, and security

dimensions, given the additional pressure that displacement places on services, infrastructure, urban expansion, industrialization, and technological advancement. This study adopted a descriptive-analytical approach, deemed the most suitable methodology for examining the relationship between climate change and spatial migration. This was achieved through an analysis of relevant literature and studies. Data were collected from diverse scientific sources, international reports, and studies published by organizations specializing in climate change and spatial migration. The study focused on clarifying the role of desertification, drought, water scarcity, floods, and other related climatic phenomena in increasing spatial migration. It also concentrated on specific countries with fragile environments where spatial migration resulting from climate change has increased. Regarding previous studies, numerous research papers have addressed the relationship between climate change and spatial migration from multiple perspectives. One such study, conducted in Khuzestan province, demonstrated that climate change and environmental degradation have a significant impact on migration, contributing to increased economic stagnation, unemployment, corruption, violence, crime, and infrastructure deterioration. (Khavarian-Garmsir et al., 2019) A study conducted in Khuzestan showed that one of the reasons for spatial displacement is the rise in temperatures and the decrease in rainfall rates. (Dehcheshmeh & Ghaedi, 2020) a study in Bangladesh revealed the impact of climate change-related risks on migration using qualitative and quantitative approaches. The results of the analysis indicated that climate change-related events forced populations to move from high-risk areas to lower-risk areas. (Seddiky et al., 2023) a study in Sudan showed that recurring droughts, erratic rainfall patterns, and a fragile economy dependent on agricultural production led to internal displacement of populations within national borders. ("Seifeldin and,etal, 2024). A study conducted in southern Iraq showed that the marshes and agricultural areas are suffering from spatial displacement due to drought and desertification, which threatens food security and agricultural production and increases poverty and unemployment rates (Yim & Mamshai, 2026) . A study in Nigeria and Burkina Faso examined droughts, floods, and agricultural losses that led to the displacement of eight million people (Eboreime et al., 2025) . A study in Niger demonstrated that livestock production was negatively impacted by rising temperatures and desertification, contributing to increased migration.(KAWENG and et al., 2026) .

## II. The concept of spatial migration:

The issue of displaced persons has been a central topic of discussion since the beginning of climate change, and the United Nations Environment Programme defines them as those who have been forced to migrate temporarily or permanently due to climate conditions ("Regassa and etal, 2012) . The International Organization for Migration defines environmental migrants as individuals or groups who have migrated due to a sudden or gradual change in the environment that has negatively affected their lives or living conditions, forcing them to leave their usual homes, temporarily or permanently, and to be displaced within their country or abroad.(Change, 2010) Climate change-induced migration can be defined as human movement linked to climatic factors such as drought, floods, extreme heat waves, rising sea levels, and deteriorating ecosystems, which are interconnected and rarely occur in isolation from each other.(Nantsou and et al., 2026) . Climate change is a phenomenon capable of influencing a wide range of physical and conceptual phenomena. As the concept of climate change has spread globally, it has acquired multiple and complex political and cultural connotations. However, the preferred scientific term is climate change. (Hulme, 2017) The effects of climate change are exacerbated in regions already experiencing extreme weather events, particularly floods and storms. The World Bank projects that some 216 million people will be affected by 2050, coinciding with increasing water scarcity and escalating social and agricultural threats (Huang et al., 2023) .

### **The relationship between spatial migration and climate change:**

Environmental pressure, exacerbated by climatic events such as drought, rising sea levels, flash floods, and desertification, is a risk multiplier and another negative driver of migration (Figure 1). It can affect agricultural production and the livelihoods of rural populations, and land degradation and competition for dwindling natural resources can also exacerbate conflicts and tensions, leading to further displacement and forced migration (Fotso, 2023) . Although migration is a logical option for families affected by disasters, climate

change is encouraging international migration in developing countries, and recent evidence suggests that internal migration in Asia and Africa will increase if the governments of these countries do not implement development policies that mitigate the effects of climate change. (Wiederkehr and et al., 2018) . Population movement is influenced by economic, social, demographic, and political factors, as well as factors such as transportation costs, accommodation, and local policies. Climate change has become a driving force for population movement as a result of environmental pressures, with its consequences leading to either permanent or temporary migration, or temporary displacement. It may involve the entire family or just one of its members, and it may be internal or international (Wahyuni and et al, 2020) .

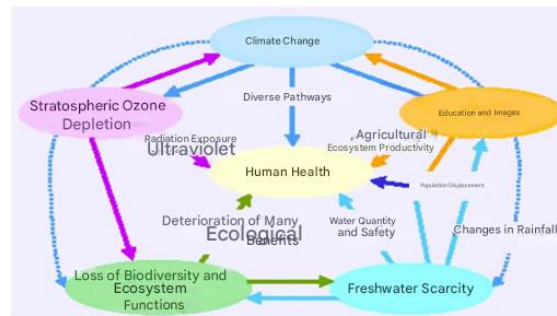


Figure (1 )The relationship between climate change and population migration.

**Source: Prepared by researchers based on literature and previous studies related to climate change and population displacement.**

### III. Effects of spatial displacement resulting from climate change:

#### First: The Economic Effects of Spatial Displacement:

When people are displaced from their areas due to drought, desertification, floods, hurricanes, or other disasters, they lose their economic assets such as agricultural land, farms, household property and even small tools. This reduces the family's ability to continue producing or earning a living. Environmental degradation, climate change, and the increasing area of land used for non-agricultural purposes place an additional burden on agriculture. Thus, climate displacement creates a negative economic cycle that repeats itself with each climate disaster, leading to an increased demand for migration (Singh et al., 2026) . Water scarcity and increasing drought are major factors in local conflicts between tribes.(Hassan et al., 2018) This has led to a decline in family ties, particularly in villages that have experienced 50% population change, making it more difficult to resolve conflicts peacefully (Schwartzstein, 2017) . The populations most affected by environmental changes are farmers with long-standing tribal claims to land that has become uncultivable due to water scarcity, salinity, or pollution, and the Marsh Arabs who can no longer rely on the wetlands for their livelihoods.(Fatli, 2018) . Poverty is a major driver of migration. When work is unavailable and hunger is a concern, people strive to find a way to succeed. When the poor cannot afford to feed themselves in their cities and witness their children suffering from hunger, they are forced to migrate. This poverty has led to them constituting the majority of urban populations, and migration has become an integral part of the contemporary international economic system. A negative impact of migration in developing countries is the brain drain, which has led to increased reliance on remittances (Ihezue et al., 2025) .

#### Secondly: The Social Impacts of Spatial Migration:

Climatic displacement leads to a change in the social structure of communities that were once socially interconnected, with their members dispersed across different cities. This results in the loss of traditional social networks that provided material and moral support. Climate displacement also leads to significant disruptions in education, especially for children and youth. Families are often forced to move to temporary locations, and this disruption in education has long-term effects, such as the loss of learning opportunities, leading to decreased levels of competence and skills. This makes children more vulnerable to persistent poverty and reduces their chances of future employment (NWOSU & OKAFOR, 2024) . Climate displacement is closely linked to the deterioration of the health of displaced persons. Families often move to overcrowded

areas or areas lacking adequate health infrastructure, which increases the spread of infectious diseases, especially those related to contaminated water such as cholera and diarrhea. This leaves deep psychological effects on individuals and the community, creating a sense of insecurity. In addition, psychological effects are one of the invisible dimensions of displacement, with disorders, depression, and anxiety becoming widespread, especially among women and children (Jafaru et al., 2025). Furthermore, the psychological health effects are more severe for women as they face additional stresses such as financial difficulties and disproportionate social isolation. Studies indicate that women are more prone to depression, anxiety, and physical symptoms as a result of difficult life events (Schuster et al., 2024).

#### **Third: The Impact of Migration on Food Security:**

Climate change negatively impacts food security in many regions, leading people to migrate to areas with better livelihoods and food sources. (McMichael, 2013). Food security is defined as the ability of people to have physical and economic access to sufficient food to meet their nutritional needs for an active and healthy life (Cochrane, 2002). There are multiple factors that have contributed to food insecurity, including limited access to productive resources and reduced land productivity due to environmental degradation (Regassa & Stoecker, 2012). Food insecurity has contributed to population migration, and 84% of Ethiopia's population is exposed to food insecurity as a result of climate fluctuations, which have caused land degradation and a decline in agricultural production levels in rural areas (Bogale, 2012). In Pakistan, infrastructure and human lives were damaged during the 2022 floods (Hashmi, 2023). Food security remains a persistent concern in Iraq, with an estimated 1.77 million people experiencing food insecurity (Iraq, 2022). This is due to environmental and climatic changes that have contributed to the loss of agricultural livelihoods and a decline in agricultural production. The most vulnerable populations rely on government food rations, making them highly susceptible to health risks associated with malnutrition (Ali et al., 2024). Food insecurity impacts the relationship between climate change adaptation strategies. For example, approximately 78% of households in Iran experienced food insecurity, increasing their risk of displacement due to climate-related disasters (Pakravan-Charvadeh et al., 2025).

#### **Fourth: Demographic Shifts:**

Climate-driven migration is one of the most prominent contemporary factors influencing the reshaping of the global demographic structure. Environmental disasters such as floods, droughts, and rising temperatures contribute to the internal and external displacement of increasing numbers of people. International reports indicate that the number of internally displaced persons reached approximately 74.6 million in 2023, the highest figure ever recorded globally, with an estimated 83.4 million new displacements expected in 2024. Climate factors play an increasingly significant role in this phenomenon, with natural disasters causing the displacement of 7.7 million people in 2023 (Charles-Edwards and et al., 2025).

#### **Global case studies on spatial migration related to climate change:**

Climate change over the past decade has led to significant social upheaval, particularly famines that have claimed millions of lives in tropical regions (Hunter and David, 2011). This has resulted in conflict and socio-political instability for large segments of the population in developing countries (Lelieveld et al., 2016). People are suffering from rising temperatures, freshwater shortages, droughts, floods, and extreme weather events, causing the displacement of 37.9 million people worldwide by the end of 2014, a number projected to reach 83.4 million by the end of 2024 (Figure 2).

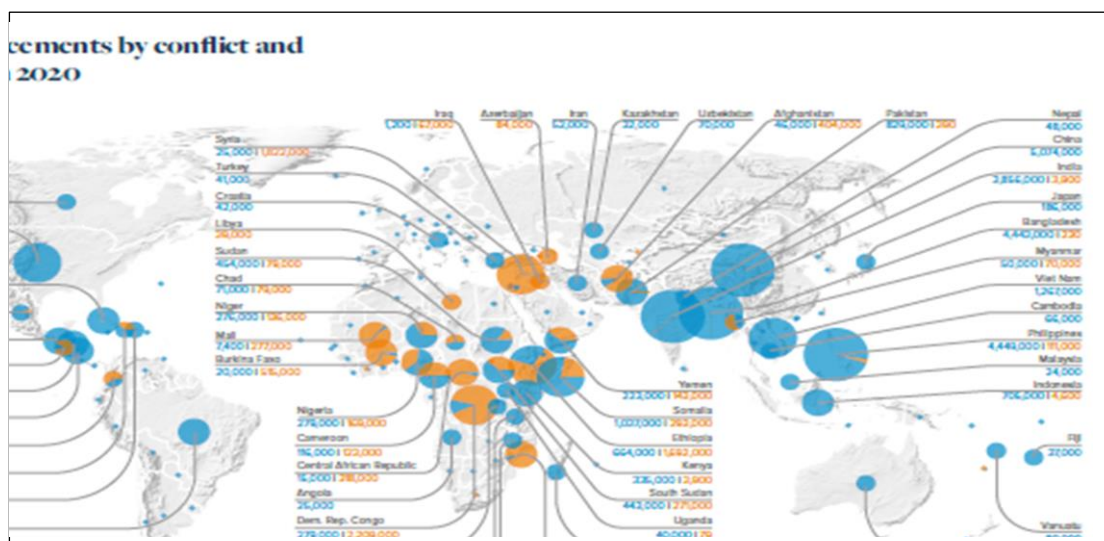
**Figure(2) Internal displacement in the world.**

| years                | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
|----------------------|------|------|------|------|------|------|------|------|------|------|------|
| Displaced persons(M) | 37.9 | 40.5 | 38.9 | 39.4 | 40.6 | 49.1 | 54.1 | 58.1 | 69.8 | 74.6 | 83.4 |

Figure (3): Displacement in countries around the world due to conflicts and disasters

| years                        | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| by disasters(M)              | 30.1 | 22.1 | 19.1 | 19.2 | 24.2 | 18.8 | 17.2 | 24.9 | 30.7 | 23.7 | 32.6 | 26.4 | 45.8 |
| by conflict and violence (M) | 6.6  | 8.2  | 11.3 | 8.9  | 8.2  | 11.8 | 10.8 | 8.6  | 9.8  | 14.4 | 28.3 | 20.5 | 20.1 |

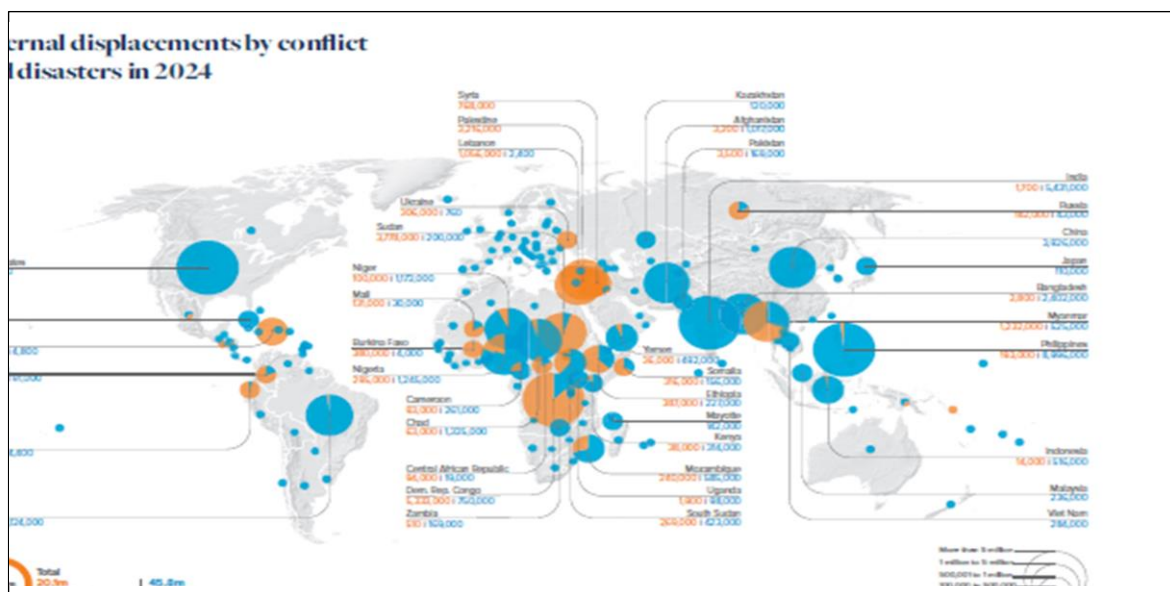
The confluence of climate-related migration factors, such as cyclones, floods, wildfires, desertification, and sea-level rise, has led to increased displacement rates. The number of people displaced worldwide by climate disasters reached 30.1 million in 2012 and is projected to reach 45.8 million by 2024 (Figure 3). The populations of 25 countries, representing a quarter of the world's population, are experiencing severe water stress (Boulange and et al., 2023) . This problem is concentrated in the Middle East and North Africa region, where it is almost double the global average of 0.8%. In India, water scarcity poses a significant threat to its 1.4 billion inhabitants. The agricultural sector in this densely populated country is heavily reliant on irrigation, but rivers have been diverted, wells and groundwater have been plundered, and groundwater levels are dropping by between one and three meters annually (Grant and et al., 2019) . Conflict is also a contributing factor to this problem. The number of displaced people worldwide rose from 6.6 million in 2012 to 20.1 million in 2024. The complex relationship between climate change, natural disasters, conflict, and displacement is clearly evident. Map (1) of global displacement in 2020 shows that 9.8 million people were displaced by armed conflict and natural disasters, while the total number of internally displaced persons in the same year reached 30.7 million. This reveals a clear disparity in displacement rates, with the highest rates of displacement due to natural disasters, particularly floods and cyclones, recorded in Asia, especially in specific regions. It is clear that the highest rates of displacement due to natural disasters, especially floods and cyclones, are concentrated in Asia, specifically in areas with harsh climates. It is also evident that spatial displacement resulting from conflict and violence is concentrated in the Middle East and Africa. Map (2), illustrating global displacement in 2024, shows an increase in the number of displaced people worldwide as a result of climate-related disasters, such as floods and cyclones, particularly in Asia, and the spread of conflicts and wars in the Middle East and Africa, including Syria, Sudan, and other countries. This indicates an overlap between environmental and political factors, reflecting the intensifying effects of climate change globally.



Map (1) Global Displacement for the Year 2020 .("Displacement, R.o.I., Global. <https://doi.org/10.55363/IDMC.XTGW2833>, 2020.,")

### Displacement in Africa

Environmental migration in Africa is an increasingly complex phenomenon. Millions of people across the continent face environmental and social challenges that force them to leave their homes in search of more stable and secure environments. It is estimated that 12% of the world's displacement has occurred in East Africa and the Horn of Africa (Abdullahi and Nagabhatla, 2026). The impact of changing climate conditions tends to exacerbate existing problems affecting migration in such regions, where more than 7.8 million displacements were recorded in 2024 due to disasters. Floods and storms, followed by droughts, played the largest role in internal displacement due to disasters. North African countries are facing severe drought, changes in rainfall patterns, and many other climate changes, making them vulnerable to extreme heat waves, water crises, and food challenges, which forces some of the population to migrate. The worsening living conditions in countries heavily dependent on climate and food imports pose significant challenges for spatial groups (Mahlatsi, 2023). Small island developing states are particularly affected, forcing many of their populations to migrate or become displaced. The number of people displaced by disasters in Africa rose from 1.1 million in 2015 to 7.8 million in 2024. Figure 4 illustrates displacement trends over time.



Map (2) Global Displacement for the Year 2024 .

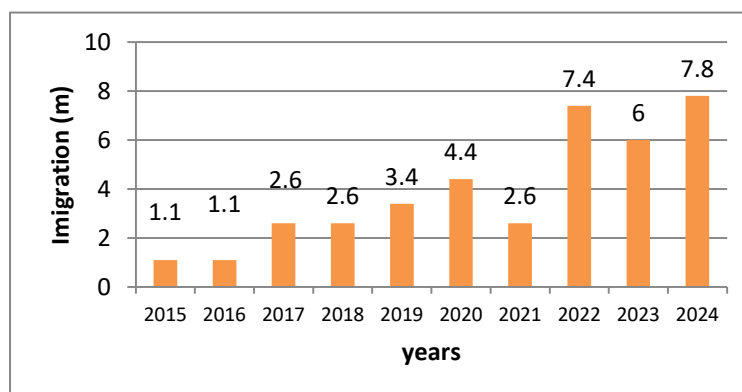


Figure (4) Population displacement in Africa due to conflicts and climate disasters

### Displacement in Somalia:

In Somalia, particularly in densely populated communities lacking clean water and sanitation, the risk of infectious diseases such as cholera is high. Girls may be unable to attend school due to domestic responsibilities or security concerns. Women face additional pressures such as financial hardship, language barriers, discrimination, and social isolation. These interconnected factors have a profound impact on public health and resilience (Bharadwaj and Huq, 2022). Somalia experienced 5,036,806 displacements (Figure 5) between 2008 and 2022. The data indicate that drought and flooding are the leading environmental hazards causing displacement, reflecting their impact on ecosystems. These are followed by storms and forest fires, the latter showing a limited impact but still posing a serious environmental threat to vegetation and biodiversity. This has resulted in increased spatial displacement, necessitating the adoption of effective water resource management strategies to mitigate environmental risks (Raulerson, 2024).

### Displacement in South Sudan:

Displacement in South Sudan is not a transient phenomenon, but rather a complex consequence of the interplay between climate change and human activities. South Sudan is among the countries most affected by climate change, experiencing 2,439,512 displacements (Figure 6). A major climatic driver of displacement is recurrent flooding, which forced 2,439,512 people to internally relocate between 2008 and 2022 in search of more stable areas. Irregular rainfall patterns, increasing drought, agricultural land degradation, and food insecurity have also contributed to the displacement of 8,720,000 people. Thus, displacement is the result of complex environmental, economic, and security factors, including armed conflict, which, since 2023, has displaced 13 million people (8.6 million internally) and others to neighboring countries.

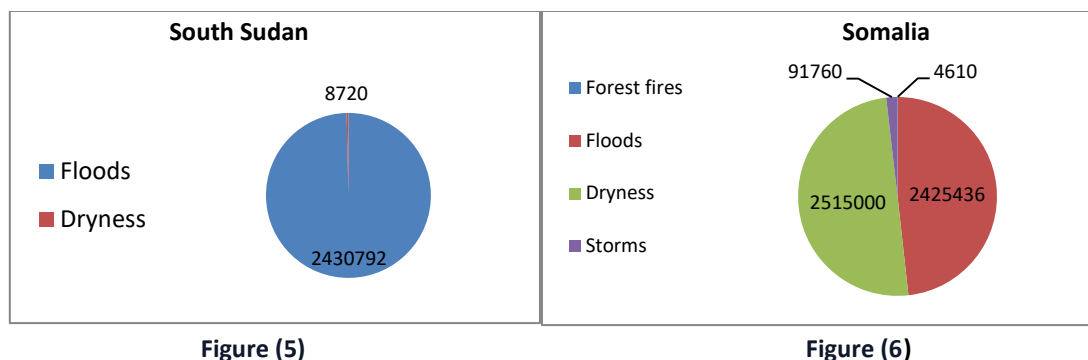
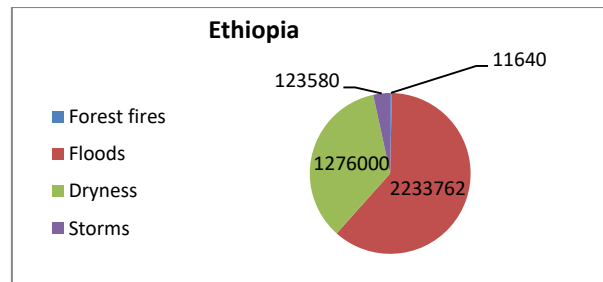


Figure (5) (6), displaced persons in Somalia, South Sudan, and Ethiopia according to displacement motives, 2008-2022.

### Displacement in Ethiopia:

Internal displacement is a serious problem in Ethiopia. The number of individuals or groups forced to flee their homes and settlements has increased. Ethiopia is one of the most complex environments in the world, where a combination of climatic, economic, political, and social factors drive people both within and outside the country. During this period, 3,644,982 people were forcibly displaced (Figure 7) due to climatic conditions. Flash floods in various parts of the country destroyed homes and crops, forcing 2,233,762 people to flee their homes. The eastern and southern regions of the country have been experiencing recurring droughts, the worst in 40 years, leading to water shortages and the inability to farm and graze livestock. This has forced 1,276,000 people to flee their homes between 2008 and 2022. The country suffers from disasters in the form of storms that have led to the displacement of 123,580 people, while forest fires, which arise due to drought and high temperatures, have led to the displacement of 11,640 people due to the destruction of large areas of vegetation, air pollution and loss of biodiversity (Spink, 2020).



**Figure (7) displaced persons in Somalia, South Sudan, and Ethiopia according to displacement motives, 2008-2022.**

### Displacement in Afghanistan

Afghanistan, with its diverse terrain and steep slopes, has experienced numerous natural disasters, including droughts, landslides, floods, flash floods, avalanches, and earthquakes. Floods, caused by heavy rainfall and snowmelt, pose a significant threat to life and property. This is compounded by inadequate response and recovery efforts and a lack of effective early warning systems. Between 2010 and 2019, 2,245 floods were recorded (Dogan, 2016). The degradation of mountain vegetation and widespread deforestation intensified in 2021, further eroding the soil. Afghanistan's snow-fed rivers are particularly vulnerable to seasonal flooding. Floods affect approximately 101,000 people annually, causing significant economic losses, including nearly US\$54 million in damages per year. In 2024, 473,000 people were displaced by floods (Hussein and et al., 2025). Afghanistan is a landlocked country, and the majority of its population (74%) lives in rural areas. Only 20% of Afghanistan's land is arable, and approximately 75% is vulnerable to desertification due to worsening droughts and increased heat waves, which severely damage crops and livestock (Dahmani Scuitti et al., 2023). The most severe droughts have caused widespread displacement, affecting more than 6.5 million people since 2000. In 2019, more than 370,000 people were displaced. In 2022, there were 496 drought events, highlighting the severity of the problem, resulting in estimated economic losses of around US\$280 million (Guiu, 2022). Since 2012, Afghanistan has experienced 17 major earthquakes, displacing approximately 605,000 people. These events highlight the significant impact of internal displacement in the country. These figures underscore the diverse environmental challenges that contribute to population displacement in the country (Ikram et al., 2024). Climate change is not the only direct cause of displacement. Ongoing conflict across vast areas of the country, including ground and air operations involving improvised explosive devices (IEDs), has caused both physical and psychological harm. In 2018, some 550,000 people were forced to flee their homes due to the loss of their livelihoods as a result of the conflict. In 2019, there were 98 suicide attacks. It is estimated that some 250,000 Afghans will require emergency medical treatment in 2019 due to the ongoing conflict, and that 1.8 million people are living outside their home areas as a result of the conflict (Přívára and Přívarová, 2019).

### Displacement in Iraq

Iraq is one of the countries most exposed to the problem of global warming, drought, and low rainfall (with an annual average of less than 200 mm), and low water levels in the Tigris and Euphrates rivers, which has led to a water crisis or what is known as the "water gap" which has caused economic and social damage (Hussein, 2025). Water flows in 2035 are projected to be significantly lower than in 2015, representing a decrease of 17.64 billion cubic meters from the 77.37 billion cubic meters recorded in 2015. This results in a deficit of 10.94 billion cubic meters. The Tigris and Euphrates rivers are expected to experience severe drought conditions by 2040 due to reduced water releases from upstream countries (Eltaif and et al., 2024). Climate change has directly exacerbated desertification in many areas, particularly in central, southern, and western Iraq. This has led to an increase in degraded agricultural land, loss of fertility, and deterioration of vegetation cover, weakening its productivity. Combined with increased environmental and economic pressures, this has resulted in the instability of rural populations in these regions and a rise in migration to areas with more stable water resources. The central and southern governorates of Iraq witnessed the largest number of internally displaced persons (IDPs), with 173,659 displaced families between 2021 and 2024. Many families have abandoned their livelihoods entirely, including agriculture. The migration of rural populations and the loss of social capital in rural areas pose a new concern, especially regarding the displacement of farming families.

Those who remain face new security risks due to the abandonment of their homes and farmland, and increased criminal activity resulting from limited alternative employment opportunities. As the number of migrants continues to rise, the economy will contract, and job opportunities will diminish even further. Displacement itself is a driving factor (Guiu, 2020). Dhi Qar Governorate recorded the highest number of displaced families during this period (Table 8). This is attributed to its location in the south of the country, making it more vulnerable to drought and the decline in the water level of the Euphrates River, resulting in a more fragile environment compared to other governorates. Other governorates also suffer from low rainfall, declining river and groundwater levels, and high soil salinity, leading to tribal conflicts (Mustak, 2022). In addition to conflicts, environmental changes have increased displacement in the southern governorates due to drought, water scarcity, and desertification. This has negatively impacted the agricultural sector, which relies primarily on surface water from the Tigris and Euphrates rivers, leading to a decrease in crop productivity and a 50% drop in staple food production, which poses serious consequences for food security and public health (Black et al., 2011). The southern governorates have also experienced waves of internal displacement. Desertification contributed to the displacement of 10,052 families, while drought displaced 6,709 families, followed by water scarcity which led to the displacement of 604 families. This brings the total number of displaced families in southern Iraq to 17,365 (Table 9). This is due to the heavy reliance on climate-sensitive agriculture and scarce resources, which makes families more vulnerable to environmental shocks. This has weakened their socio-economic resilience and depleted resources (Jedi and Al-Jawari, 2023). This has rendered traditional livelihoods in the southern governorates of Iraq unsustainable and increased displacement and environmental migration. Thus, the Iraqi situation represents a causal cycle starting with climate change, followed by worsening drought, increased desertification, and deterioration of water resources, culminating in clear patterns of migration and spatial displacement.

| NO | Governorate | 2021 | 2022 | 2023  | 2024 | Total |
|----|-------------|------|------|-------|------|-------|
| 1  | Basra       | 2    | 2    | 947   | 0    | 951   |
| 2  | Qadisiyah   | 3    | 3    | 1434  | 1383 | 2823  |
| 3  | Muthanna    | 0    | 0    | 1264  | 404  | 1668  |
| 4  | Najaf       | 0    | 1    | 54    | 687  | 742   |
| 5  | Dhi Qar     | 7    | 14   | 7390  | 2114 | 9525  |
| 6  | Maysan      | 3    | 453  | 1924  | 163  | 1643  |
| 7  | Wasit       | 0    | 0    | 14    | 0    | 13    |
| 8  | Total       | 15   | 473  | 12126 | 4751 | 17365 |

**Figure (8) The displaced families in the governorates of Iraq for the period (2021-2024).**

| NO | Governorate | Desertification | Drought | Water shortage | Total |
|----|-------------|-----------------|---------|----------------|-------|
| 1  | Basra       | 948             | 3       | 0              | 951   |
| 2  | Qadisiyah   | 2730            | 39      | 54             | 2823  |
| 3  | Muthanna    | 60              | 1582    | 26             | 1668  |
| 4  | Najaf       | 730             | 6       | 6              | 742   |
| 5  | Dhi Qar     | 5486            | 3538    | 501            | 9525  |
| 6  | Maysan      | 88              | 1538    | 17             | 1643  |
| 7  | Wasit       | 10              | 3       | 0              | 13    |
| 8  | Total       | 10052           | 6709    | 604            | 17365 |

**Figure (9) of displaced families in the governorates of Iraq according to the reasons for displacement,(2021-2024)**

#### IV. Conclusion

Data shows that climate change impacts are not limited to environmental aspects but extend to population patterns and social stability, resulting in increased displacement rates worldwide due to climate disasters. This displacement reached 45.8 million people in 2024, while conflicts and violence displaced 20.1 million in the same year. This displacement is concentrated in the most fragile regions, and estimates indicate that 216 million people will be displaced by 2050. The study revealed that drought, desertification, and declining water resources are among the most prominent factors contributing to increased spatial displacement, particularly in fragile areas. Somalia experienced 5,036,806 displacements between 2008 and 2022, with drought and floods being among the most significant environmental hazards causing displacement. Drought, agricultural land degradation, and food insecurity have contributed to the displacement of 8,720,000 people in South Sudan, demonstrating that displacement is a result of both environmental and economic factors. Iraq has also experienced waves of internal displacement. Desertification has displaced 10,052 families, while drought has displaced 6,709 families, followed by water scarcity, which has displaced 604 families. This brings the total number of displaced families in southern Iraq to 17,365. The study also highlights that climate-related spatial displacement has become one of the most significant challenges globally, particularly in developing countries with limited capacity to adapt and mitigate its effects. The study emphasizes the importance of adopting comprehensive international and regional policies to enhance adaptation, especially in fragile areas within arid and semi-arid environments, and to support economically affected communities through development projects and improved water and agricultural resource management. Addressing food insecurity through development plans and agricultural initiatives strengthens communities' resilience to climate change and reduces displacement. Furthermore, it promotes future studies related to climate change and population shifts to better understand the environmental risks influencing spatial migration.

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