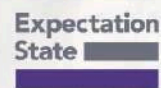




Climate Change Impacts and Mobility in the Middle East:

What do we know?

MMC Research Report,
April 2024



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Acknowledgements

Researched and written by:

Mohammad Asfour and Lucy Hovil

Reviewed by:

Jane Linekar, Bram Frouws, Samane Salimi-Tari,
Justine Cherrier, Wassim Ben Romdhane,
Rahma Moussa

Layout and design: Sol Mokdad

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Executive summary

Climate change impacts and the environment have long played a crucial role in the historical and social development of the Middle East and impacted the movement of people. However, there is growing evidence that resilience in the face of severe climate deterioration associated with global warming over recent decades may be considerably less likely than it was in the past.¹ Even if the worst possible catastrophes that some predict are averted, the region's ability to adapt is challenged by the fact that it is one of the most conflict-prone regions in the world, with a potential trajectory towards further autocratization, impoverishment, and/or political violence.

Mobility opportunities have always been an important factor facilitating resilience in the face of environmental deterioration. Alongside this, the ability for many people across the region to move and start new lives has been reduced significantly over recent decades.²

It is increasingly self-evident that climate change impacts are threatening livelihoods, undermining local resilience and worsening socio-economic vulnerabilities in the Middle East. Yet in this context, the link between climate change impacts and mobility is neither linear nor straightforward;³ and it is highly context-specific. While globally, the relationship between climate change and other environmental impacts⁴ and human mobility is increasingly being recognised,⁵ evidence to nuance and contextualise this link is relatively nascent in the Middle East.

This study, based on a review of the literature relevant to climate change impacts and mobility in the Middle East as well as a number of key informant interviews (KIIs) carried out during February and March 2024, seeks to assess the state of knowledge on climate change impacts on mobility in the Middle East and provide a foundation for further research to fill evidence gaps for policy and programming.

Key findings

First, while the study establishes **a clear relationship between human mobility and immobility and the impacts of climate change, the challenge is to understand the impacts of climate change on mobility in relation to other factors**, including conflict, lack of good governance, mismanagement of natural resources, availability of job opportunities and environmental degradation. This requires additional research that not only accounts for environmental and economical factors but delves deep into human behaviour and sociology.

Second, **the degree of impact that climate change has on mobility or immobility can vary from one situation to another, depending on a range of factors such as the intensity of climatic variability and extremes, their longevity, and the prevailing level of resilience and preparedness within a certain region**. It is also evident that impacts from climate change exacerbate the intensity of other factors contributing to human mobility and could represent an important tipping point, triggering a significant increase in human movement, especially in rural communities where the impact on livelihoods is more apparent.

Third, **in cases of climate variability and extremes, people across the Middle East often prefer to stay within homes and communities** that are often closely knit, unless their livelihoods or safety are jeopardised. This can be observed particularly in communities that have already been impacted by climate variability and extremes, such as those that depend on land and agriculture, and areas affected by cyclones and severe storms. When their main source of income can no longer provide them with sustenance, their adaptation form of choice would be to move to areas they are familiar with, preferably in their home country. Thus, movement from rural areas to cities within the same region or country is expected to increase significantly. Regardless of what drives it, human movement will

¹ Thompson, W. and Zakhirova, L. (2021) Climate Change in the Middle East and North Africa. 1st edn. Taylor and Francis. DOI: <https://doi.org/10.4324/9781003158127>

² Ibid.

³ Mixed Migration Centre (2022) Climate-related events and environmental stressors' roles in driving migration in West and North Africa. Available at: www.mixedmigration.org

⁴ Throughout the report, use of the term 'climate change impacts' also incorporates environmental factors that might also play a role.

⁵ As evidenced by the wording in the global stocktake that came out of the recent 28th Conference of the Parties (COP28) of the United Nations Framework Convention on Climate Change (UNFCCC) See IDMC (2023). [COP-28: What did it say about displacement and climate change?](#)

continue to place extra burdens on city infrastructure and is likely to increase the need for governments to create more economic opportunities, jobs and sustainable infrastructure in urban areas.

Fourth, for those who do move, **the vast majority stay within their country of origin** - or, at the very least, within the region. Movement outside of the region, therefore, is minimal, and policy and programmatic responses need to reflect this reality. A disproportionate focus on the few who migrate to other regions risks neglecting the areas where support is most needed.

Fifth, at a national level, **climate adaptation does not appear to score high on Middle Eastern government priority lists - even in more prosperous countries that have the resources to act.** Unless comprehensive climate adaptation plans are devised sooner rather than later, more people are likely to be forced to move or become trapped in increasingly vulnerable locations. This scenario, coupled with the intensifying impacts of climate change, will place even greater pressure on already strained resources and government capacities.

Yet, sixth, **the inequalities in the region are stark - both between countries, but also within countries.** For instance, the options facing the scores of Gulf Cooperation Council (GCC)⁶ citizens who escape the soaring summer temperatures by travelling abroad and/or limiting the time they spend outdoors are in stark contrast to migrant workers, who often comprise a majority of the population in these countries, and who live in less favourable conditions and face the brunt of the harsh GCC climate; or to refugees and internally displaced populations across the region that have had their few resources depleted by years of displacement; and to farmers seeing dwindling returns and little by way of a safety net. GCC countries have the resources to act, but as long as wealthy populations are able to live comfortably with benefits such as air conditioning, there is little incentive to change and achieve climate-smart adaptation measures that benefit everyone. At the same time, countries that are most dependent on agriculture (including Syria, Yemen and Iraq), which makes them more vulnerable to climate change impact, are facing challenges of conflict and corruption, and seem to be the least capable of adaptation, let alone building resilience. Ultimately, inequalities and experiences of climate-related (im)mobility are also likely different according to age and gender, as well as geography, displacement status, wealth and type of livelihood, although more research is needed to be done to explore these and other factors.

In sum, this picture points to growing concerns of over-stretched resources; growing (or more apparent) inequalities; inadequate infrastructure development in line with population growth; and increased pressure on available agricultural land to feed a growing urban population.

Inevitably, all of this is having an impact on populations' mobility and immobility, although a general dearth in disaggregated data on the linkages between climate impacts and mobility (albeit with a few exceptions) has created a lack of nuance in understanding of what people are thinking and doing in response to climatic challenges and how this differs among different population groups. This has then led to a tendency for generalisations and assumptions to dominate in many discussions, which are difficult to transform into informed and effective programming and policy.

Despite this somewhat bleak picture, there is considerable scope for integrating human mobility into climate strategies and policies,⁷ both in countries that have already developed their national adaptation plans and in those that have not yet done so but are under increasing global pressure to do so. There is a need to revise climate governance structures in a systematic manner to ensure that the legal mandate, enforcement system and funding mechanisms are all in place, while empowering the environmental community within each country to be heard, and to act. Ensuring a sufficient empirical base from which to do so is critical in this regard.

⁶ The GCC comprises Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates.

⁷ Wright, E, Tänzler, D and Rüttinger, L (2020). [Migration, environment and climate change: Responding via climate change adaptation policy](#)

1. Introduction

This report assesses the state of knowledge on climate change impacts on mobility in the Middle East (including Bahrain, Iran, Iraq, Jordan, Kuwait, Lebanon, Oman, Palestine, Qatar, Saudi Arabia, Syria, United Arab Emirates and Yemen) and provides a foundation for further research to fill evidence gaps for policy and programming. It draws together current understanding of how climate change impacts are likely to change the existing numbers and dynamics of internal and cross-border migration, including whether this impact is likely to prompt increased movement and, if so, what kind; and explores what effect climate change impacts are having on existing migrant and displaced populations.

1.1 Methodology

The report is based on two sources. First, an extensive literature review of academic papers, grey literature, technical reports and policy briefs written in English and Arabic focused on climate vulnerability and linkages between climate change impacts and mobility in the region (see map below), as well as in individual countries in the region. A total of 155 entries and 22 data source websites were reviewed in total during February and March 2024, to create an annotated bibliography. The material was then collected, organised and synthesised thematically and geographically in order to build up an understanding of the relevant context, priorities and trends in the region, as well as to identify information gaps.

Figure 1. Map of Middle East countries included in the study and their populations⁸



Second, between 12th February and 15th March 2024, 15 interviews were carried out with individuals in and from the region who have a particular understanding of climate change impacts and/or mobility in the Middle East; and three focus group discussions organised during the United Cities and Local Governments Middle East and West Asia Regional Organization (UCLG-MEWA) event on Climate and Human Mobility in Jordan. The event included approximately 30 municipality representatives who shared their perceptions around linkages between climate change impact and mobility. The key topics covered in the interviews included perspectives on climatic and environmental changes in the Middle East, potential linkages between climate variability and extremes and mobility or immobility, and ways in which movement is characterised. The interviews allowed the team to triangulate and sense-check the

⁸ World Bank Open Data Portal, <https://data.worldbank.org/indicator/SP.POP.TOTL>

findings from the literature review. The combined data from both the literature review and interviews were analysed into specific themes and geographies, and form the basis of this report.

1.2 Report overview

The report begins with an overview of climate change impacts in the Middle East, set in an historical context and considering the impact of climate change at regional, national and community levels. It looks specifically at the impact of climate change in relation to heat and water resources. The following section focuses on mobility and immobility in the region - both voluntary and forced - and explores how the movement of people is impacted by climate related issues. The final section pulls these two aspects together with a number of key findings, before outlining six areas for future research.

2. Climate change impacts in the Middle East

2.1 Historic context: millennia of climate change impact and adaptation

Climate change and its effects have been a preoccupation of populations in the Middle East for millennia, alongside related challenges of human-caused environmental devastation and resource extraction.⁹ Episodes of increased rainfall over the last 400,000 years transformed the generally arid Arabian Peninsula into a hospitable route for human population movements across Southwest Asia.¹⁰ Archaeological research has discovered sites in the Nefud Desert of Saudi Arabia, for instance, that are associated with the remains of ancient lakes that formed when periods of increased rainfall transformed the region into grassland, allowing humans to spread into the region during each 'Green Arabia' phase and establishing northern Arabia as a crucial migration route and a crossroads for early humans.¹¹

The region has experienced major climatic shifts since the end of the last glacial age about 15,000 years ago when small Natufian villages began to emerge in the eastern Mediterranean area. Such shifts and the environment have played a crucial role in the historical and social development of the region and impacted the movement of people, who could, and often did, move to other parts of the region that were not as strongly affected and started their lives over - an option that might no longer be possible in the current time.¹²

2.2 Current overview

The current climatic outlook is bleak. As a recent World Bank report states, the Middle East is "one of the most vulnerable regions to climate change, enduring extremely high temperatures, desertification, water scarcity, degraded marine and coastal ecosystems and high levels of air pollution."¹³ Most of the region is characterised by a hot, arid and semi-arid desert climate, which makes it highly vulnerable to climate change impacts.

The buildup of carbon dioxide, which is already underway, threatens to raise temperatures throughout the region to a level that will no longer sustain human life. There is widespread consensus throughout the literature that the Arab world "is one of the most ecologically depleted regions in the world and has been for centuries due to persistent anthropogenic pressures. This ecological depletion, which includes high water vulnerability and low soil productivity, predisposes the region to environmental shocks. Climate change impacts are making those worse."¹⁴

⁹ Wehrey, F. (2023). [Introduction to Climate Change and Vulnerability in the Middle East](#). Carnegie Endowment for International Peace

¹⁰ Groucutt, H S et al. (2021). [Prehistoric climate change repeatedly channelled human migrations across Arabia](#). Max-Planck-Gesellschaft

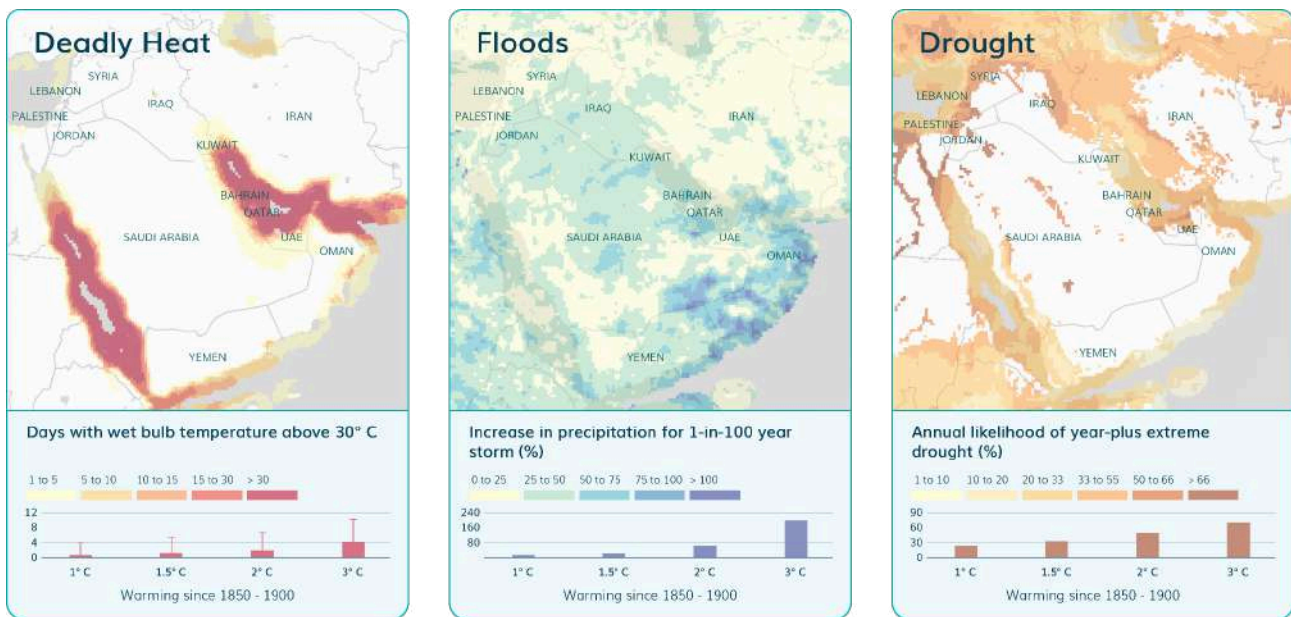
¹¹ Ibid.

¹² Thompson and Zakhirova (2021), Op. cit.

¹³ World Bank (2022). [Middle East & North Africa Climate Roadmap](#)

¹⁴ Lazard, O (2023). [Climate Change in the Arab World Requires More Holistic Reforms](#). Carnegie Endowment for International Peace

Figure 2. Overview of heat, floods and droughts in the Middle East¹⁵



Given that large populations are highly dependent on imports of food and likely to encounter even greater water scarcity than already prevails, the potential for a major regional crisis in which the very survival of many of the region's inhabitants cannot be guaranteed is a real possibility. Without adaptation, it is predicted that annual real gross domestic product (GDP) in the Middle East and North Africa (MENA) countries will decline by somewhere in the range of 1.1% to 6.6% by mid-century and will disproportionately affect poor and vulnerable households.¹⁶ Likewise, the IMF estimates that climate disasters in the Middle East have already caused an annual average of \$2 billion in direct material damages and have affected over seven million residents each year.¹⁷ A recent report concludes that the region's three main climate stresses have further intensified since the 1990s: temperatures have risen by 1.5°C, twice the global increase of 0.7°C; precipitation has become even more erratic than in any other region; and climate disasters, such as droughts and floods, have occurred more often than in the past.¹⁸

2.3 The impact of climate change in the region

Two of the key impacts of climate change relate to heat and water resources, which are each discussed in turn.

Extreme temperatures

Multiple sources point to a 2°C increase in temperatures in the region between 2021 and 2039, with a possible maximum increase of 2.5°C during summer and autumn. Climate change impacts, therefore, will affect the region severely even if emissions are cut according to the Paris Agreement.¹⁹ Indeed, the Middle East is already facing temperatures rising almost twice as quickly as the rest of the world, according to a report by The Cyprus Institute's Climate and Atmosphere Research Center and the Max Planck Institute for Chemistry.²⁰ Likewise, the United States' National Aeronautics and Space Administration (NASA) argues that large parts of the Gulf region as a whole will become almost unlivable by 2050 due to rising average temperatures. Iraq is facing increasing heatwaves exceeding 50°C causing recurrent power blackouts, dwindling levels of the Euphrates and Tigris rivers, food shortages, plummeting labour productivity due to unbearable heat, and an increase in sandstorms that obstruct oil tankers' access to the southern ports.²¹

¹⁵ Aldhous, P (2024). [Where will climate change hit hardest? These interactive maps offer a telltale glimpse](#), PNAS

¹⁶ World Bank (2023). [MENA Country Climate and Development Report: Climate Change Action in the Middle East and North Africa - Key Insights from Country Climate and Development Reports. CCDR Series](#)

¹⁷ Duenwald, C (2022). [Feeling the Heat: Adapting to Climate Change in the Middle East and Central Asia](#). International Monetary Fund

¹⁸ Ibid.

¹⁹ Gaub, F and Lienard, C (2021). [Arab Climate Futures: Of Risk And Readiness](#). EUISS

²⁰ Abu Allan, K et al. (2023). [How is Climate Change Affecting MENA? Local Experts Weigh in](#). Wilson Center

²¹ Mann, Y (2023). [Another looming crisis in the Middle East: Climate change](#). Observer Research Foundation

The desert areas of Saudi Arabia will face some of the harshest impacts of global warming, including extended heat waves that last for months, not days. In 2016, Kuwait registered a temperature of 54°C, perhaps the highest in the region and the world.²² Recent projections suggest that extreme heat will make cities including Jeddah very difficult to live in within 30 years; and the Arabian Peninsula will likely be too hot for human habitation within 80 years, as temperatures exceed the physical limits of human bodies.²³ Likewise, the average annual temperature in Oman has increased in the last decade and is likely to continue rising, causing more intense heat waves and higher demands for electricity to power air conditioning.²⁴

Extreme temperatures have led to recurrent power blackouts, reductions in labour productivity and have put a significant strain on agriculture. In Syria, for instance, agriculture has traditionally accounted for 25% to 30% of gross domestic product (GDP), providing the bulk of employment opportunities among rural communities in the country's breadbasket regions. As a result of drought from 2006 to 2010, which was before the war started in 2011, approximately 370,000 to 460,000 people from northeastern and eastern Syria were forced to leave their homes to seek better livelihoods in other parts of the country.²⁵

Temperature-warming trends, therefore, have a negative impact on food security and food production across the Middle East, particularly in rural areas, where there are populations dependent upon rain-fed agriculture. And with a still growing population, the region also contains the least arable land per person compared to other parts of the world.²⁶ Iran, which is the world's biggest supplier of the world's most expensive spice, saffron, produced only half of its 2022 production in 2023 as a result of 'extreme weather'. While saffron only accounts for a small percentage of the total proceeds of Iran's agricultural output, it functions as a lifeline for about 100,000 families living in desert areas such as Khorasan.²⁷ In Saudi Arabia, farmers are facing insect infestations and increased frequency of crop diseases as a consequence of the impact of climate change.²⁸

²² A higher recorded temperature is disputed. Barhouma, M (2023). [Kuwait and Climate Change Challenge: The Difficult Path to Sustainability](#). Emirates Policy Center

²³ Ramsay, A (2021). [Will climate change stop Arabia from being Saudi?](#) openDemocracy

²⁴ Al-Kalbani, M.S (2014). Vulnerability Assessment of Environmental and Climate Change Impacts on Water Resources in Al Jabal Al Akhdar, Sultanate of Oman. *Water* 6:3118-3135. DOI: <https://doi.org/10.3390/w6103118>

²⁵ Marwa Daoudy (2023). [Climate Change and Regional Instability in the Middle East. Discussion Paper Series on Manaqina Global Disorder No. 14](#). Council on Foreign Relations

²⁶ Ibid.

²⁷ Ghaffari, B (2023). [Saffron supplies dry up as climate change shrivels Iran's 'desert gold'](#). Financial Times

²⁸ Alotaibi, BA et al. (2021). Climate Change Concerns of Saudi Arabian Farmers: The Drivers and Their Role in Perceived Capacity Building Needs for Adaptation. *Sustainability* 13(22):12677. DOI: <https://doi.org/10.3390/su132212677>

Table 1. Economic overview and agriculture value added in Middle Eastern States

Countries	GDP (current US\$, (in millions) ²⁹	GDP per capita (current US\$) ³⁰	Agriculture value added (% of GDP) ³¹	Employment in agriculture ³²	Employment in agriculture (% of the workforce) ³³
Yemen	21,606	650	28.7	1,226,300	29
Syria	8,970	421	27.8	654,900	15
Iran	413,493	4,670	12.8	3,312,900	15
Palestine	19,110	3,790	6.3	70,700	6
Jordan	48,653	4,311	4.8	76,700	3
Lebanon	23,132	4,136	1.4	56,600	4
Iraq	264,183	5,937	2.9	725,400	8
Saudi Arabia	1,108,572	30,448	2.4	429,570	3
Oman	114,667	25,057	1.8	130,300	6
United Arab Emirates	507,064	53,708	0.8	99,200	1
Kuwait	175,363	41,080	0.5	57,900	2
Bahrain	44,383	30,147	0.3	8,200	1
Qatar	236,258	87,662	0.3	36,500	1

LOW INCOME ■ LOWER-MIDDLE INCOME ■ UPPER-MIDDLE INCOME ■ HIGH INCOME ■

The impact on health is also a concern. The United Nations Children's Fund (UNICEF) estimates that by 2050, every child in Iraq will be exposed to high heatwave severity.³⁴ In Bahrain, for instance, sandstorms are impacting the air quality, leading to related respiratory diseases.³⁵ Likewise, conditions for migrants working in Qatar in the build-up to the World Cup not only led to many dying, but also to long-term damage, including kidney damage, which they will live with for the rest of their lives. In addition to extreme heat, water shortages and air pollution are also concerns for health.³⁶ In Kuwait, migrant workers are one of the population groups most vulnerable to the harsh climate conditions, where an increase in dust storms has led to a greater risk of death for non-Kuwaitis, even among younger age groups, due to prolonged exposure to outdoor conditions.³⁷

Water

Alongside an increase in temperature, the Middle East is projected to be the first region in the world to run out of water.³⁸ According to the Water Resources Institute, 14 out of 33 countries that are most likely to be water-stressed³⁹ in 2040 are located in the Middle East.⁴⁰ Water is often the first victim of climate change, and, while water-stress is caused not just by climate change but also by the mismanagement of resources, it is clear that water scarcity is a common challenge throughout the region. The World Bank estimates that climate-related water scarcity will cost Middle Eastern nations between 6 and 14 percent of their GDP by 2050 as a result of water-related impacts on

²⁹ World Bank Open Data Portal. <https://data.worldbank.org/indicator/NY.GDP.MKTP.CD>.

³⁰ Ibid.

³¹ Ibid.

³² ILO Department of Statistics.

https://rshiny.ilo.org/dataexplorer44/?id=EMP_TEMP_SEX_ECO_NB_A&ref_area=BHR+IRN+IRO+JOR+KWT+LBN+PSE+OMN+OAT+SAU+SYR+ARE+YEM&sex=SEX_T&classif1=ECO_SECTOR_AGR&latestyear=TRUE

³³ World Bank Open Data Portal, Op. cit.

³⁴ Shuker, Z (2023). [The Deep Roots of Iraq's Climate Crisis](#). The Century Foundation

³⁵ SCE/UNFCCC (2012). [Bahrain's Second National Communication](#)

³⁶ Neira, M et al. (2023). Climate change and human health in the Eastern Mediterranean and Middle East: Literature review, research priorities and policy suggestions. *Environmental Research* 216(2): 114537. DOI: <https://doi.org/10.1016/j.envres.2022.114537>

³⁷ Alahmad, B (2022). [Climate, The Environment and Health of Migrant Workers: Lessons from Kuwait](#). Project on Middle East Political Science, POMEPS

³⁸ Al-Delaimy, W.K. (2020). Vulnerable Populations and Regions: Middle East as a Case Study. In: Al-Delaimy, W., Ramanathan, V., Sánchez Sorondo, M. (eds) *Health of People, Health of Planet and Our Responsibility*. Springer, Cham. DOI: https://doi.org/10.1007/978-3-030-31125-4_10

³⁹ Water stress measures total annual water withdrawals (municipal, industrial, and agricultural) expressed as a percentage of the total annual available blue water. Higher values indicate more competition among users.

⁴⁰ Luo, T. Young, R and Reig, P (2015). [Aqueduct Projected Water Stress Country Rankings](#). World Resources Institute. (2-15)

agriculture, health, and incomes.⁴¹ In no other region of the world, therefore, does the availability of water play such a dominant role in determining the settlement, growth and movement of human populations.⁴²

Increased water stress is expected to lead to a particularly significant loss of arable land in Syria, Lebanon, Iraq, Yemen and Jordan.⁴³ More than 12 million people in Iraq and Syria, for instance, are losing access to water, food, and electricity because of rising temperatures and record low rainfall, and desertification is sweeping across the region in Iraq, Syria, Jordan and Iran.⁴⁴ By 2022, approximately 39% of Iraq's arable land territory had been desertified, and 54% is in danger of becoming desertified.⁴⁵ In 2022, the Iraqi Ministry of Water Resources warned that the country's water reserves had halved since the previous year.⁴⁶ The decline in water levels has left roughly three out of five children in Iraq with no access to safely managed water services, and less than half of all schools in the country have basic access to water. If no action is taken, by one estimate, water shortages could affect over 2 million children and their families by 2030.⁴⁷ In 2019, the World Bank estimated that the gap between water demand and supply in Iraq could increase from 5 billion cubic metres to 11 billion cubic metres by 2035, which would represent more than 15% of the total water demand.⁴⁸

In Iran, where nearly 85% of the country is in semi-arid and arid climates, the country faces both prolonged droughts and floods.⁴⁹ It is expected to experience an increase of 2.6 °C in mean temperatures alongside a 35% decline in precipitation in the next decades, leading to depleted groundwater levels, drying lakes and extreme events.⁵⁰ Likewise, The Gulf Cooperation Council (GCC) states are facing declining water availability, increased high-heat days, humidity extremes, dust storms, coastal flooding,⁵¹ sea level rise and biodiversity loss. This is leading to serious soil degradation, in addition to salt intrusion in aquifers and compromised food security.⁵² In Oman, for instance, changing patterns in precipitation are posing critical challenges. Already one of the most water-stressed countries in the world, Oman is also projected to see an increase in heavy rainfall, which may damage its power infrastructure, contribute to soil erosion and dump silt into water dams.⁵³

Similarly, Jordan is one of the world's most resource-poor, arid and freshwater-stressed countries, with the impact of climate change aggravating these challenges further. Environmental challenges include freshwater scarcity, arable land degradation, desertification, drought, extreme heat, and loss of biodiversity.⁵⁴ More than 50% of arable land is located in the arid zone (annual rainfall 250-300mm), which is highly sensitive to the impact of climate change.⁵⁵ Forecasts estimate that climate impacts "will impinge on workers' livelihoods, ranging from reduced incomes to complete displacement from jobs", and "Jordan's highly segmented labour market impedes workers' capacity to move between segments to find better or alternative jobs."⁵⁶ Climate change impacts are seen to also represent a serious threat to the growing tourism industry, which is highly reliant on water and is the largest export sector in Jordan, accounting for more than 30% of goods and services' trade before the pandemic.⁵⁷

Water access is complicated by geopolitical issues in a context in which 50% of the Middle East countries' water sources are "located outside of their political boundaries".⁵⁸ A good example is tensions between Iran, Iraq, Syria, and Türkiye over water management around the Euphrates and Tigris river systems.⁵⁹ Palestinians, on the other hand, require a permit from the Israeli military to drill new wells - "which they normally do not receive";⁶⁰ and Israel currently controls approximately 80% of water reserves in the West Bank. "Those resources support Israeli settlements that are

⁴¹ World Bank (2017). [Beyond Scarcity: Water Security in the Middle East and North Africa](#)

⁴² Abbott, S.G. and Stivachtis, YA (2019). [Demography, Migration and Security in the Middle East](#). E-International Relations

⁴³ EUISS (2021). [Arab climate futures](#)

⁴⁴ Alaaldin, R (2022). [Climate change may devastate the Middle East. Here's how governments should tackle it](#). Brookings Institution

⁴⁵ Shuker (2023), Op. cit.

⁴⁶ Ibid.

⁴⁷ Ibid.

⁴⁸ World Bank Group (2022). [Iraq Country Climate and Development Report](#)

⁴⁹ Mansouri Daneshvar, MR et al. (2019). An overview of climate change in Iran: facts and statistics. Environmental Systems Research 8(7). DOI: <https://doi.org/10.1186/s40068-019-0135-3>

⁵⁰ Ibid.

⁵¹ Huckstep S and Dempster H (2022). [After the Petro-dollars: Gulf Migration in a Climate Change Future](#). Center for Global Development

⁵² Keynough, B (2023). [Climate-induced migration in the GCC states: A looming challenge](#). Middle East Institute

⁵³ IEA (2023). [Climate Resilience for Energy Transition in Oman](#)

⁵⁴ El-Anis, I and Poberezhskaya, M (2023). Responding to Climate Change in Jordan: understanding institutional developments, political restrictions and economic opportunities. British Journal of Middle Eastern Studies. DOI: <https://doi.org/10.1080/13530194.2023.2279332>

⁵⁵ UN Women (2018). [Rural Women and Climate Change in Jordan](#)

⁵⁶ Ibid.

⁵⁷ World Bank Group (2022). [Jordan Country Climate and Development Report](#)

⁵⁸ Kandeel, A (2019). [Freshwater Resources in the MENA Region: Risks and Opportunities](#). Middle East Institute

⁵⁹ Lazard, O (2023), Op. cit.

⁶⁰ EUISS (2021), Op. cit.

considered illegal under international law. Israelis living in the settlements often pollute shared streams in ways that further limit Palestinians' access to clean water.⁶¹ Even before the recent conflict in Gaza escalated, the Gaza Strip was second only to Kuwait as the most water-poor region in the world, with only 10% of the population having direct access to clean, safe drinking water.⁶²

A reduction in water resources, in turn, is thought to be accompanied by increased urbanisation. In Lebanon, already 89% of the population live in urban areas.⁶³ Across the region more broadly, the European Union Institute for Security Studies (EUISS) estimates that rural exodus rates will increase by 20%, pushing urbanisation in the region to 62% in 2030 and 70% in 2050.⁶⁴ Some of this urbanisation will be extremely rapid. For instance, the population of Baghdad is expected to double between 2010 and 2030.⁶⁵

Other impacts

Alongside water access and heat challenges, floods and cyclones are also having an impact. Sudden heavy rain, for instance, can contribute to soil erosion, which has a negative impact on agriculture and grazing. It also dumps silt into water dams, which depletes their capacity. In Yemen, floods displaced more people than conflict and violence in 2020, aggravating what was already commonly referred to as the world's worst humanitarian crisis.⁶⁶ Recent research has shown that Oman is likely to be exposed to frequent storms and cyclonic events, and Wadi flooding has caused destruction to urban infrastructure and other land uses in the country.⁶⁷

It is estimated that sea level may rise by an average of 0.36m in a 1.5°C average warming scenario, and 0.6m in a 4°C scenario by 2100, accelerated by coastal erosion in parts of the region.⁶⁸ This is notable as a large share of the region's population and economic activity are in flood-prone urban coastal zones: 7% of MENA's total population lives in areas less than 5m above sea level, which includes major metropolitan areas, with an estimated 100 million people potentially exposed to coastal flooding by 2030.⁶⁹ Seawater can also intrude into coastal aquifers and wells, salinizing the water and devastating littoral agricultural communities as well as reducing municipal water supplies.⁷⁰ A comparative study of 84 coastal developing countries, for instance, estimated that about 24% of MENA's coastal GDP and 20% of its coastal urban areas are exposed to sea level rise and storm surges, which amounts to approximately twice as much compared to the same indicators measured worldwide.⁷¹

2.4 Exploring climate change impacts in a broader context of conflict and instability

As stated above, the Middle East is one of the most conflict-prone regions in the world, with a potential trajectory towards further autocratization, impoverishment, and/or political violence. In some parts of the region, a key factor affecting, and potentially exacerbating, the impact of climate change is ongoing conflict, or recovery from past conflict.

The extent to which climate change impacts are a *driver* of conflict is much debated. Some attribute the start of the civil war in Syria to the drought of 2010 that led to significant rural to urban migration which, in turn, led to increasing unrest in urban environments.⁷² A link has also been made between the October 2019 violent riots in Lebanon (following the government's intentions to cut gasoline subsidies to raise taxes) and a heatwave prior to the riots,

⁶¹ Marwa Daoudy (2023), Op. cit.

⁶² Ibid.

⁶³ Yahya, M. and Issam Kayssi. (2023). [Lebanon: Can a green economy pave the way out of economic collapse?](#) Carnegie Endowment for International Peace

⁶⁴ EUISS (2021), Op. cit.

⁶⁵ Ibid.

⁶⁶ IDMC (2021). [Global Report on Internal Displacement: Internal displacement in a changing climate](#)

⁶⁷ Al-Kalbani, M.S (2014). Vulnerability Assessment of Environmental and Climate Change Impacts on Water Resources in Al Jabal Al Akhdar, Sultanate of Oman. *Water* 6:3118-3135. DOI: <https://doi.org/10.33390/w6103118>.

⁶⁸ UNEP (2023). [Adapting to a New Climate in the MENA Region. An assessment of physical risk management and climate adaptation finance in the MENA region](#)

⁶⁹ Ibid.

⁷⁰ Ibid.

⁷¹ Dasgupta, S. et al. (2011). "Exposure of developing countries to sea-level rise and storm surges." *Climatic Change*, No. 106, p. 567–579. DOI: <https://doi.org/10.1007/s10584-010-9959-6>

⁷² Mann (2023), Op. cit.

which led to huge fires in the Shuf Mountains, damaging many of its cedar trees;⁷³ and some see the water crisis in Yemen exacerbating conflict.⁷⁴

Basra in Iraq, for example, used to have 30 million palm trees but now there are less than 1 million.⁷⁵ This depletion of a vital resource was, to a great extent, an outcome of the Iran-Iraq war, which raged from 1980 to 1988, during which the region was subjected to an almost unbroken series of landscape-altering disasters in a bid to vanquish a long time rebel hideout, a situation that was subsequently exacerbated by neglect and poor resource management.⁷⁶ Environmental and climatic challenges have also been linked to socio-economic turmoil and severe security disturbances, as evidenced by the violent protests of 2018 in southern Iraq.⁷⁷ Likewise, research links recruitment by Islamic State in August 2014 in the North Abu Zarag Marsh near Nasiriyah in southern Iraq to a decade of deterioration in water quantity and quality “in a community where almost every profession is dependent on the Tigris and Euphrates’ irrigation of the marshlands.”⁷⁸

Others dispute any direct link and downplay climate as a driver of conflict,⁷⁹ putting forward a strong critique of what are viewed as overly securitised and deterministic readings of climate change.⁸⁰ This line of argument generally views the link between the effects of climate change and conflict as being poorly backed up by evidence. Conflict is seen to correlate with several elements that climate change impacts are likely to produce, including economic loss, growing competition for resources and deterioration of living conditions. Eklund, for instance, challenges the narrative that links the 2007-2009 drought in Syria to the outbreak of conflict in 2011, arguing that “the influential drought-migration-conflict narrative for Syria needs to be reexamined, with implications for wider discussions of how climate change might alter conflict risk.”⁸¹

What is clear, though, is that negative climatic and environmental factors are, in different ways and in different contexts, exacerbating ‘fragility’ in conflict and post-conflict countries and communities in the region. Furthermore, and as discussed below, conflict also impedes climate action.

2.5 How prepared is the region?

Given these realities, a key question is how, if at all, are individual countries responding to these challenges, and how prepared are they for predicted climatic changes? Globally, states have generally privileged climate change mitigation over adaptation,⁸² and the evidence suggests that this appears to be the case in the Middle East, where countries are downscaling climate scenarios and climate information.⁸³

Governance

There is general consensus that this approach is closely tied to the specificities of Arab governance. As one writer argues, “a long time preference for centralised, top-down policies by insular, autocratic, and repressive Arab regimes - ubiquitous, in varying degrees, despite the initial hopes of the 2011 Arab uprisings - has translated into a reluctance to permit or encourage the sort of grassroots, bottom-up activism that is necessary to build effective climate resilience.”⁸⁴ While technological solutions are important, politics, governance and human agency are important “in mediating the exposure of societies to environmental hazards and climate change.”⁸⁵ This argument is echoed in much of the literature, which places a strong emphasis on the need for more political will into putting adaptation strategies into practice.⁸⁶ It is telling, for instance, that Kuwait and Palestine were the first to develop and submit their National Adaptation Plans (NAPs). It is important, however, to also highlight some of the promising efforts taking place in the region. Yemen launched its National Adaptation Programme of Action (NAPA) during April 2009, but its efforts were

⁷³ Ibid.

⁷⁴ Ibid.

⁷⁵ OHCHR (2023). [Climate change, pollution threaten Iraq’s ancient marshes](#)

⁷⁶ Schwartzstein, P (2023). [Climate, Water And Militias: A Field Study From Southern Iraq](#). Center for Climate and Security

⁷⁷ Lazard, O (2023), Op. cit.

⁷⁸ Schwartzstein (2023), Op. cit.

⁷⁹ Marwa Daoudy (2023), Op. cit.

⁸⁰ Wehrey, F. (2023). [Introduction to Climate Change and Vulnerability in the Middle East](#). Carnegie Endowment for International Peace

⁸¹ Eklund, L (2022). Societal drought vulnerability and the Syrian climate-conflict nexus are better explained by agriculture than meteorology. *Communications Earth & Environment* 3: 85. DOI: <https://doi.org/10.1038/s43247-022-00405-w>.

⁸² Wehrey (2023), Op. cit.

⁸³ UNDP (2019). [Middle East and North Africa in Focus](#)

⁸⁴ Wehrey (2023), Op. cit.

⁸⁵ Ibid.

⁸⁶ Dargin, J. (2023). [Beyond “green pledges”: Saudi Arabia and society-centred climate reforms](#). Carnegie Endowment for International Peace; KILs.

hindered by civil war.⁸⁷ Saudi Arabia developed climate scenarios focusing on water resources, desertification, agriculture and health. Palestine has identified 12 sectors for vulnerability assessment.⁸⁸ Jordan introduced its Third National Communication Report (TNC) climate projections with dynamic downscaling until the year 2100 with moderate-high levels of confidence for all climate parameters using 43 grid points.⁸⁹ And the UAE, which hosted COP28, is currently developing its National Adaptation Plan roadmap.⁹⁰ While ultimately the evidence will lie in actions taken by governments, these shifts in the policy environment represent an important starting point.

Linked to this is a general lack of empowerment at a community level to bring about change, with civil society generally frustrated at the lack of traction on this issue.⁹¹ For instance, an assessment of adaptation projects in the MENA region carried out by the United Nations Development Programme (UNDP) identified the importance of a policy and governance environment that promotes participative project design, decentralised management and facilitated community involvement to ensure community engagement in building up resilience to climatic changes - factors which, they argue, are often absent.⁹² The case of Palestine-Israel puts this into sharp focus, given that Palestine's vulnerability to the impact of climate change should, as many argue, be understood in the context of seven decades of occupation, displacement, dispossession, oppression, and poor governance.⁹³ In general terms, therefore, the evidence points to a picture of top-down governance that often leaves communities facing the brunt of the impact of climate vulnerabilities and disempowered to act.

A context of regional inequalities

Sitting alongside challenges in governance is the fact that there are significant inequalities within the region in terms of ability to adapt. While some states, such as those in the Gulf, have the necessary resources to adapt to the impact of climate change and mitigate its effects, those that are worst placed are those states that are currently experiencing conflict, including Iraq, Syria and Yemen.⁹⁴ As a result, they are thought to be the states that will be hit the hardest by both direct and indirect effects of climate change.⁹⁵

In addition to the challenges of conflict and post-conflict recovery, most low-income countries in the region rely on farming and agriculture that is rain-dependent, and where there is poor governance and lack of resources to address the impact of climate change through adaptation.⁹⁶ This, in turn, further exacerbates the situation as "the more climate-related disruptions that come their way, the greater the challenges and crises to deal with over time and the less fiscal and economic space they have to handle those crises."⁹⁷ It is clear, therefore, that the impact of climate change is increasingly widening levels of inequality and poverty and is likely causing reversals in development gains, posing a particular challenge for countries whose national and regional baselines are already fragile.⁹⁸

Yemen, for instance, prior to the outbreak of conflict in 2014, already faced a precarious water situation, as groundwater had been overexploited. This was then made worse during the war, not least as aerial bombardment by Saudi and Emirati forces destroyed Yemen's water and sanitation infrastructures. 19 million people are currently without access to clean water.⁹⁹ Likewise in post-conflict Iraq, a report by Stockholm International Peace Research Institute (SIPRI) talks about how a combination of droughts and water scarcity impacts livelihoods, contributes to increased internal migration and displacement and exacerbates tensions within communities; but at the same time, armed groups and militias exploit economic hardships and grievances, which are further exacerbated by weak governance and corruption. Combined, this undermines climate change adaptation and resilience building, which then accentuates the marginalisation, exclusion and grievances of vulnerable groups.¹⁰⁰

⁸⁷ UNDP (2009). [Yemen National Adaptation Programme of Action \(NAPA\) Official Document - April 2009](#)

⁸⁸ United Nations Framework Convention on Climate (2024). [Submitted NAPs from developing country Parties](#)

⁸⁹ Ibid.

⁹⁰ [National Adaption Plan Roadmap for the Arab Emirates](#) (2023)

⁹¹ Klls with members of civil society, February 2024.

⁹² UNDP/GEF (2018). [Climate Change Adaptation in the Arab States: Best practices and lessons learned](#)

⁹³ Agha, Z (2019). [Climate Change, the Occupation, and a Vulnerable Palestine](#). Al-Shabaka: The Palestinian Policy Network

⁹⁴ Gaub and Lienard (2021), Op. cit.

⁹⁵ Ibid.

⁹⁶ Al-Delaimy, W.K. (2020). Vulnerable Populations and Regions: Middle East as a Case Study. In: Al-Delaimy, W., Ramanathan, V., Sánchez Sorondo, M. (eds) *Health of People, Health of Planet and Our Responsibility*. Springer, DOI: https://doi.org/10.1007/978-3-030-31125-4_10

⁹⁷ Lazard, O (2023), Op. cit.

⁹⁸ Ibid.

⁹⁹ Marwa Daoudy (2023), Op. cit.

¹⁰⁰ SIPRI (2023). [Climate, Peace and Security Fact Sheet: Iraq \(2023\)](#)

At the same time, having resources is not, in and of itself, necessarily sufficient. Political acknowledgement and willingness to respond to climatic challenges also play an important role. For instance, oil-rich Gulf states with diversified, non-agriculture-based economies have significantly more adaptive potential than poorer non-oil-rich states.¹⁰¹ Yet the evidence points to a general lack of preparedness in these GCC countries for managing the impact of climate change, including changes in responding to an increase in internal migration to urban areas and the absence of any regional policy framework for adaptation.¹⁰² In this regard, the interaction between climate risk and adaptive readiness – in other words, the level of risk from climate change versus the ability to carry out short- and long-term responses – depend on both socioeconomic and political conditions.

Ultimately, levels of preparedness are often the result of multiple, interlinked factors that cut across issues of stability, fiscal profile, governance and geography. For instance, experts argue that Iran's response to climate change and environmental impacts has also amplified related challenges: "Tehran's failed efforts to remedy water scarcity, including dam building and water-intensive irrigation projects, have contributed to the drying up of rivers and underground water reservoirs."¹⁰³

In addition to climate change and environmental impacts, countries in the region are struggling to cope with "the impact of a growing youth population, bloated public sectors, volatile oil prices, weak governance, and the fallout from the pandemic."¹⁰⁴ And these multiple factors, in turn, are having an impact on the mobility - or immobility - of people.¹⁰⁵ As an International Committee of the Red Cross (ICRC) report argues, the "combined effects of climate change, environmental degradation and armed conflict are both shaping and exacerbating humanitarian needs across the Near and Middle East, with impacts on human security, livelihoods, health and mobility."¹⁰⁶

Labour migration in GCC countries

The United Arab Emirates, Qatar and Kuwait rank first, second and third worldwide, respectively, with regard to the proportion of migrants in their population.¹⁰⁷ Two-thirds of the population in Kuwait are migrant workers.¹⁰⁸

Accountability and good governance in the workplace are a significant challenge in GCC states, and have a particular impact on migrant workers. In Bahrain, for instance, "migrant workers continued to face employment discrimination and limited access to adequate housing, education and healthcare. Bahrain does not have a legislated minimum wage in the private sector, where most migrants work, unlike the public sector."¹⁰⁹ Specifically, the kafala system makes it hard for migrants to easily change jobs; and employers are often exploitative. Some progress has been made at a policy level.¹¹⁰ However, while authorities in the Gulf argue these changes have effectively abolished the kafala system, a significant body of literature argues that "barriers remain in place that continue to deny foreigners equal rights in the workplace."¹¹¹

In the GCC, increased temperatures, even under more optimistic mitigation scenarios, are expected to markedly increase heat-related mortality.¹¹² Those who are already vulnerable, such as migrant workers, are unable to access many climate adaptation and resilience measures. In this context, is there a sustainable future for labour migration in these countries? What role do climate and environmental impacts have as push factors in driving migration to the GCC states? What coping mechanisms are available to migrants to deal with the challenges they face?

¹⁰¹ Marwa Daoudy (2023), Op. cit.

¹⁰² Keynoush (2023), Op. cit.

¹⁰³ Esfandiari, G and Zarghami, M (2023). [Iran's Climate Migration Crisis Could Turn Into National 'Disaster'](#). Radio Free Europe/Radio Liberty

¹⁰⁴ Alaaladin, R (2022). [Climate change may devastate the Middle East. Here's how governments should tackle it](#). Brookings Institution

¹⁰⁵ Ibid.

¹⁰⁶ ICRC (2023). [Making Adaptation Work: Addressing The Compounding Impacts Of Climate Change, Environmental Degradation And Conflict In The Near And Middle East: Summary For Policymakers](#)

¹⁰⁷ ESCWA (2022), Op. cit.

¹⁰⁸ Alahmad, B et al. (2022). Climate change and health in Kuwait: temperature and mortality projections under different climatic scenarios.

Environmental Research Letters 17 (7): 4001. <https://iopscience.iop.org/article/10.1088/1748-9326/ac7601>

¹⁰⁹ Amnesty International (2022). [Bahrain 2022](#)

¹¹⁰ Sherman, B (2022). [Changing the Tide for the Gulf's Migrant Workers](#). Wilson Center

¹¹¹ Ibid.

¹¹² Ibid.

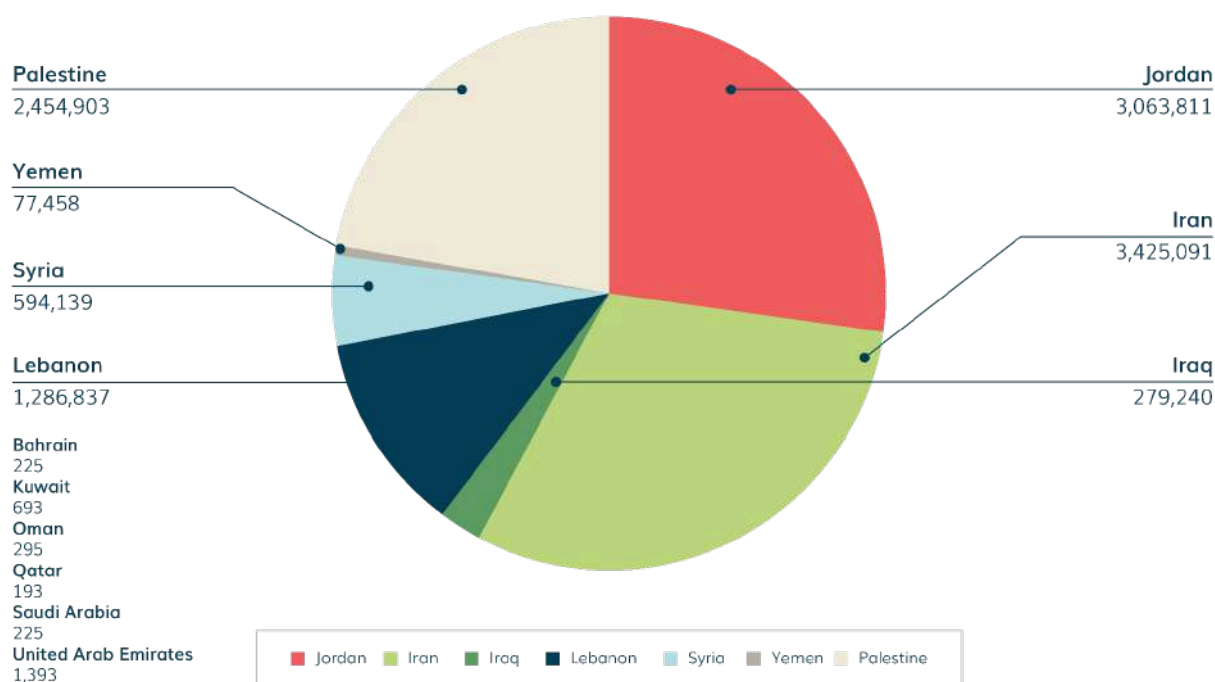
3. (Im)mobility in the Middle East in relation to climate change and environmental impacts

In light of this overview of climate change impacts, the following section considers the relationship between these findings and mobility/immobility to, in and from the region.

3.1 Overview of mobility in the region

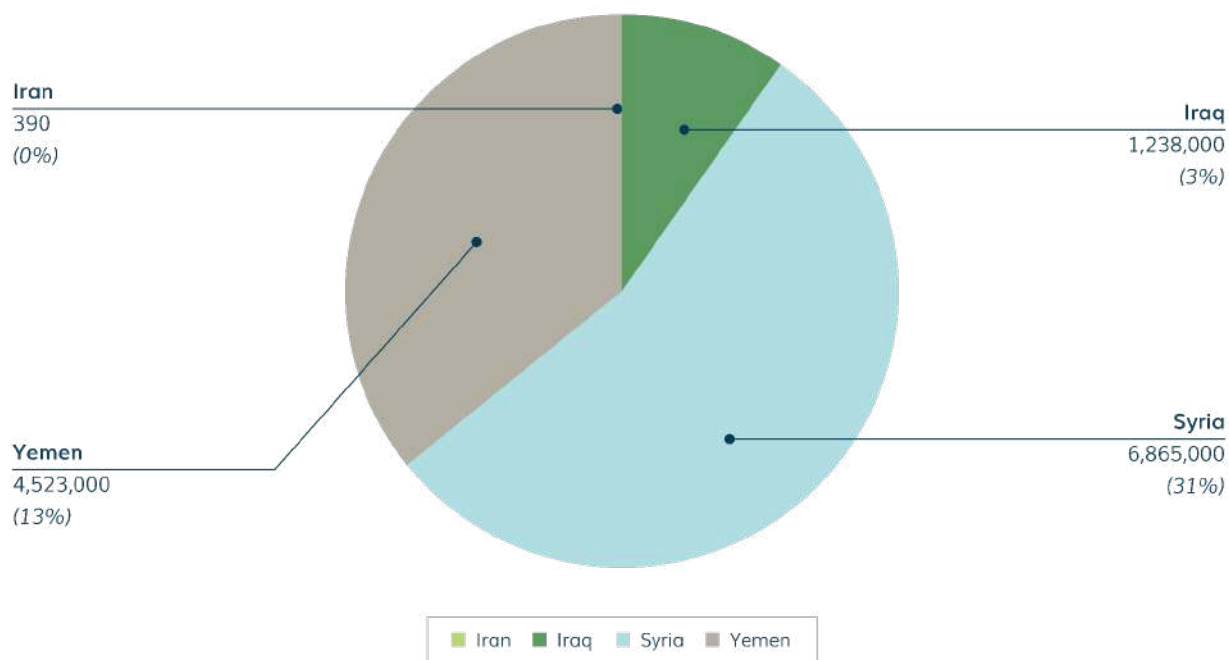
People have always moved within, from and to the Middle East. However, over the past decades, an increasing amount of this movement has been forced, creating large populations of refugees and internally displaced persons (IDPs). Most of those who have been displaced have remained within their countries of origin or, at most, have moved to neighbouring countries. A minority have moved to countries outside of the region, moving in search of safety and/or jobs. While ongoing conflicts continue to create new displacement, notably in Yemen and Syria, significant populations of forcibly displaced are living in protracted exile - for decades in the case of many Palestinian refugees, and for over a decade for many Syrian and Iraqi refugees. The ongoing displacement of refugees and IDPs alike reflects the widespread failure to find durable solutions to their displacement. This has led to a growing legacy population of displaced persons, most notably in Jordan, Lebanon and Iran (in the case of refugees) and in Syria, Yemen and Iraq (in the case of IDPs). Many of these populations have, in effect, become stuck or involuntarily immobile - unable to return home but lacking the resources and opportunities to move on.

Figure 3. Refugee population in the Middle East by host country¹¹³



¹¹³ UNHCR Refugee Data Finder <https://www.unhcr.org/refugee-statistics/download/?url=2Flin7>

Figure 4. IDP distribution (number and % of national population ¹¹⁴)



Alongside forced movement in the region, significant numbers of people are moving voluntarily, particularly from rural to urban areas. One report estimates that rural exodus rates will push urbanisation in the region to 62% in 2030 and 70% in 2050; and some of this urbanisation will be extremely rapid - for instance, the population of Baghdad is expected to double between 2010 and 2030.¹¹⁵ Notably, labour migration - both from within and outside of the region - is dominant in the GCC, where the numbers are striking: in 2020, Qatar was estimated to rely on non-nationals for 95% of all employment; Kuwait for 85%; and Bahrain for 78%.¹¹⁶ Less significant numerically is seasonal mobility within countries (for instance in the Jordan Valley). Relatively speaking, and contrary to speculation, more permanent movement outside of the region is minimal.

Table 2. Labour migrants populations among the Gulf Cooperation Council states¹¹⁷

Countries	% of total workforce	Migrants % of population
Bahrain	80%	45.2%
Kuwait	82%	70%
Oman	30%	29%
Qatar	95%	79%
Saudi Arabia	76% ¹¹⁸	37%
United Arab Emirates	96%	88%

In addition to extensive movement within and into the region, what these statistics do not show is that the vast majority of people do not move. The literature and interviews place a strong emphasis on the fact that many people, given the choice, want to remain in their homes, often as a result of strong attachment to their land and way of life.¹¹⁹ Even harder to count, are the numbers of those who are forced to remain where they are for lack of alternatives, despite the fact that mobility might be a vital coping mechanism.

¹¹⁴ IDMC Data Portal (2022). <https://www.internal-displacement.org/database/displacement-data/>.

¹¹⁵ EUISS (2021), Op. cit.

¹¹⁶ Gulf Labour Markets, Migration, and Population (GLMM) Programme, <https://gulfmigration.grc.net/>

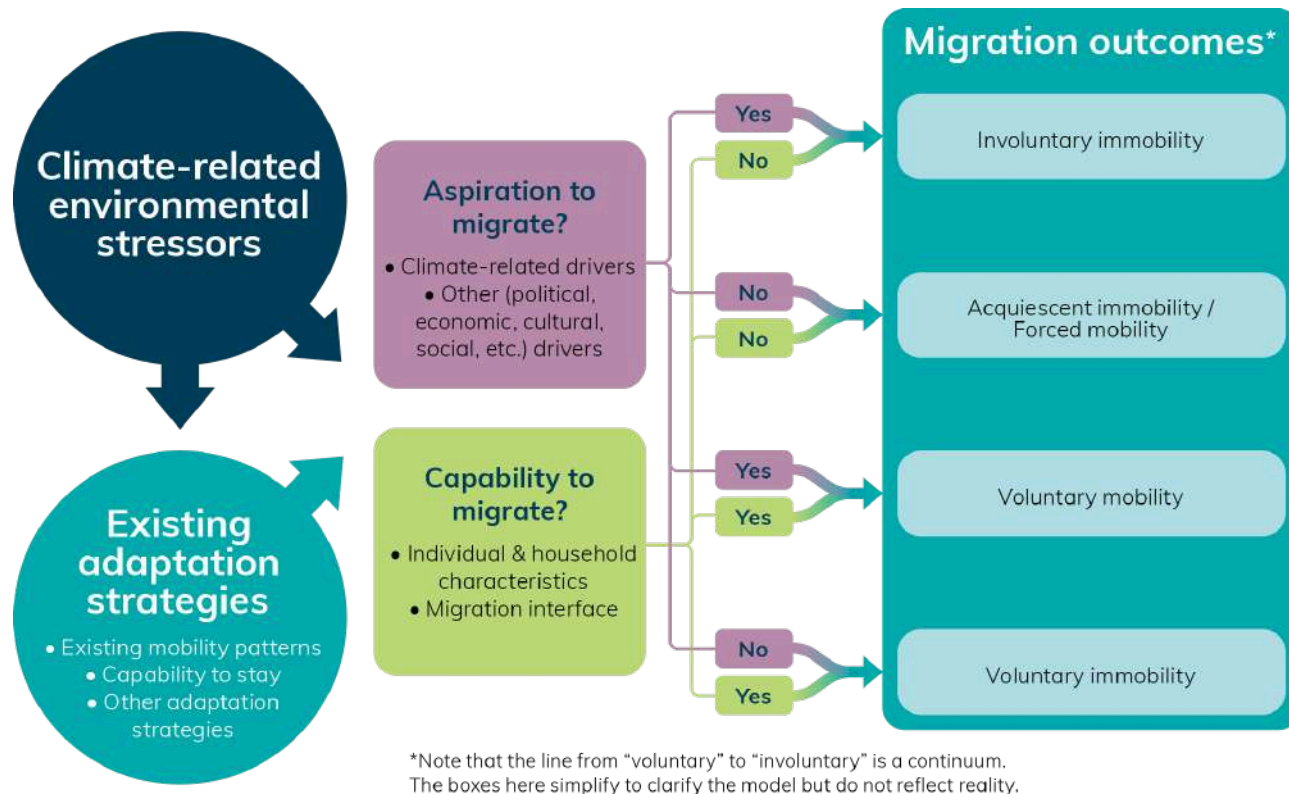
¹¹⁷ Integral Human Development - Migratory Profiles. <https://migrants-refugees.va/resource-center/migratory-profiles/>

¹¹⁸ Gulf Labour Markets, Op. cit.

¹¹⁹ See, for instance, World Bank (2014). [Climate Change and Migration: Evidence from the Middle East and North Africa](#). World Bank Studies

Drawing on a conceptual framework developed by MMC to explore the idea of mobility in a context of climate change impact, the following sections break down some of this movement into four types of mobility: forced mobility, voluntary mobility, forced immobility and voluntary immobility.¹²⁰ The framework illustrates how climate-related environmental stressors affect mobility outcomes, and how they directly and indirectly impact the aspiration and capability to migrate. While recognising that these categories are often overlapping and are rarely tidy, it provides a framing for considering the multiple and shifting forms of movement that characterise the region.

Figure 5. Conceptual framework for climate-induced mobility



Mixed Migration Centre 2022

3.2 Forced mobility

The region is host to over 11 million registered refugees and over 12 million IDPs, statistics that are high by any global standards. Conflict is clearly the dominant driver of this forced migration, as current and legacy conflicts in Palestine, Iraq, Syria and Yemen have all generated significant numbers of refugees and IDPs.

What is less clear, however, is if or how the impact of climate change (and, relatedly, environmental degradation) are linked to displacement - either in conjunction with conflict, or separate to it. The Internal Displacement Monitoring Centre (IDMC), for instance, claims that in 2022, 39% of internal displacements in the Middle East were triggered by disasters, rather than conflict, including in Syria and Iraq.¹²¹ However, the literature points to the challenges of discerning the precise role that individual factors such as climate change play in disaster-related and even conflict-related displacement, and it is clear that further research is needed on this. There is a need to investigate and establish any potential link between the impact of climate change and conflict, as well as to understand the relationship between long-term climate change impacts, as opposed to single climatological hazards, to migration and conflict.¹²²

¹²⁰ Mixed Migration Centre (2022), Op. cit.

¹²¹ World Vision International (2023). [Growing Up In The Climate Crisis The Impact Of Climate Change On Children And Young People In Iraq, Jordan, Lebanon, Syria And The West Bank](https://www.wvi.org/our-work/2023-report/growing-up-in-the-climate-crisis-the-impact-of-climate-change-on-children-and-young-people-in-iraq-jordan-lebanon-syria-and-the-west-bank)

¹²² Waha, K et al. (2017). Climate change impacts in the Middle East and Northern Africa (MENA) region and their implications for vulnerable population groups. Reg Environ Change 17: 1623–1638. DOI: <https://doi.org/10.1007/s10113-017-1144-2>, p. 12.

Certainly, in some locations it is clear that there has been significant forced movement of people out of their home areas - mostly internal, and often from rural to urban areas - linked in some way to climatic and environmental factors.

Return to Syria? Climate change impact on long-term displacement

Jordan has hosted significant numbers of refugees for decades, including Palestinian refugees in 1948 and 1967, Iraqi refugees in 2003, and Syrian refugees since 2011. Indeed, since 2015, foreigners and/or refugees have accounted for almost a third of Jordan's population of more than 10 million, and the lack of long-term solutions is putting increasing pressure on the country's resources.¹²³ Yet Jordan is one of the world's most resource-poor, arid and freshwater-stressed countries globally.

The failure to resolve the long-term displacement of Syrian refugees has left many depleted of their assets, and an estimated 80% of Syrians in Jordan live in poverty.¹²⁴ At the same time that the costs of basic necessities including food and healthcare have risen and livelihoods have been challenged by the economic fall-out from the pandemic, international organisations that provide assistance to refugees have cut programmes due to funding shortfalls.¹²⁵ The impact of climate change is aggravating the situation further, creating push factors on refugees to either return to Syria or move onward. Yet returning to Syria without a clear resolution to the conflict remains deeply problematic, and the impacts of climate change in Syria are also a factor in decision-making around return.

For instance, in Iran record temperatures, prolonged droughts, and the drying up of rivers and lakes are displacing tens of thousands of Iranians each year. Although solid data is hard to come by on Iran, many of those moving are thought to be farmers, labourers and fishermen who are moving from the countryside to major urban areas in Iran in search of alternative livelihoods.¹²⁶ According to one study, Iranian media estimates that around 42,000 people were forced to migrate in 2022 "due to the effects of climate change, including drought, sand and dust storms, floods, and natural disasters." The report also acknowledges that this figure is likely to be much higher.¹²⁷

Likewise, in Iraq, the International Organization for Migration (IOM) estimates that nearly 62,000 families live in locations where climate-induced displacement is taking place, and approximately one in four households are living in locations where at least 10% of the original population has already left.¹²⁸ It identifies five top factors that affect people's mobility: first is water; then food security; then access to services and infrastructure; reliance on land; adoption of coping mechanisms.¹²⁹ Their findings are backed up by IOM's Climate Emergency Tracking in Iraq which recorded the displacement of more than 130,000 people between June 2018 and December 2023 due to the adverse effects of climate change in their areas of origin.¹³⁰

However, climatic and environmental drivers are often indiscernible from broader challenges around governance that have either created environmental disasters or exacerbated them. The destruction of the southern Iraq marshes and the subsequent displacement of people is specifically mentioned in a number of articles as being linked both to climate and environmental factors, but also to deliberate actions taken by the state and other actors.¹³¹ As one commentator notes, "Climate change in Iraq cannot be cordoned off from foreign intervention, an oil-dependent economy, broken institutions, corruption, authoritarianism, and poor governance."¹³² An Oxfam study carried out in seven governorates in Iraq demonstrates some of these overlapping factors,¹³³ showing how the loss of agricultural productivity due to lack of water or sufficient resource allocation to farming is affecting the status of the agricultural sector as the second-largest contributor to the country's GDP after oil revenues. This, in turn, exposes a high level of fiscal fragility in

¹²³ Muasher, M. (2023). [Costs of delaying improvements in climate change governance in Jordan](#). Carnegie Endowment for International Peace

¹²⁴ Ibid.

¹²⁵ Norman, K (2023). [Migration and Displacement in the Arab World Demands a More Equitable Response](#). Carnegie Endowment for International Peace

¹²⁶ Esfandiari and Zarghami (2023), Op. cit.

¹²⁷ Ibid.

¹²⁸ IOM (2023). [DTM Iraq - Drivers of Climate-Induced Displacement in Iraq: Climate Vulnerability Assessment](#)

¹²⁹ Ibid.

¹³⁰ IOM (2023). [DTM Iraq - Climate-Induced Displacement - Central and Southern Iraq \(1 - 15 December 2023\)](#)

¹³¹ OHCHR (2023). [Climate change, pollution threaten Iraq's ancient marshes](#)

¹³² Shuker, Z (2023). [The Deep Roots of Iraq's Climate Crisis](#), The Century Foundation

¹³³ Oxfam (2022). [Unfarmed Now, Uninhabited When? Agriculture and climate change in Iraq](#)

an economy that is overly dependent on oil,¹³⁴ and is then linked to protracted displacement, primarily to urban areas, with many of those moving to urban areas being from displaced communities.¹³⁵

While the drivers are often hard to distinguish, there is broad consensus in the literature that, at the very least, climate is a ‘threat multiplier’ in relation to displacement in the region.¹³⁶ Climate shocks are putting additional pressure on communities that rely heavily on agriculture and pastoralism for their livelihood, and who also live in areas with limited access to infrastructure.¹³⁷ There are a small number of qualitative studies that look at the role of climate and environmental factors creating or exacerbating vulnerabilities, which then force people to move. For instance, a World Vision study based on research in five “climate hotspots” in Iraq¹³⁸ concludes that there has been an increase in the number of families with “no safety nets, decimated livelihoods, and no employment prospects” having to move.¹³⁹

It is clear, therefore, that climatic factors are, at the very least, “exacerbating causes and consequences of displacement and amplifying protection concerns for displaced people and returnees.”¹⁴⁰ Furthermore, they often play an indirect role by exacerbating political, economic and social tensions that may culminate in violence. The impact on countries that are caught up in conflict is particularly acute, as they are caught in a vicious cycle as conflict damages infrastructure, takes a heavy toll on national budgets, and then climate adaptation falls relatively low down the list of policy priorities.¹⁴¹

¹³⁴ Ibid. p. 3

¹³⁵ Ibid. p. 8

¹³⁶ World Bank (2022), Op. cit.

¹³⁷ ESCWA (2024), [Migration and climate change in the Arab region](#)

¹³⁸ Iraq (Ninewa Governorate), Jordan (Azraq Refugee Camp), Lebanon (Akkar District), Northeastern Syria, and the West Bank

¹³⁹ World Vision International (2023), Op. cit.

¹⁴⁰ UNHCR (2022), [Strategic Framework for Climate Action](#)

¹⁴¹ EUISS (2021), Op. cit.

3.3 Voluntary mobility

Alongside these forms of forced mobility is movement that can be broadly categorised as voluntary, some of which is driven, at least in part, by climatic and environmental factors.

First, evidence points to ever increasing internal rural to urban migration, and there is a strong consensus that this is likely to increase significantly. For instance, major river basins (including the Euphrates and Jordan) are expected to see 'dramatic' population growth.¹⁴² The pull of the city (especially among the youth, a highly significant demographic in the Middle East¹⁴³) sits alongside push factors in rural areas, many of which, as outlined above, relate to climate and environmental challenges. These include access to water, declining agricultural production and inadequate government responses.

While rural to urban mobility is not new and is by no means solely connected to climatic and environmental factors, there is growing evidence of the role it is playing as an adaptive mechanism. In Iran, for instance, there has been significant growth in urbanisation. While the impact of climate change on internal movement clearly sits alongside multiple other drivers - including the Land Reform Act of 1963 and subsequent oil boom; the 1979 Revolution and the Iran-Iraq War from 1980 to 1988, both of which accelerated rural to urban migration; and the attraction of cities for those pursuing political activism and seeking employment opportunities - there is growing awareness of its contemporary role as a driver of movement to the cities.¹⁴⁴

Second, there is also significant international migration within and to the region - and, to a lesser extent, out of the region. Labour opportunities continue to offer a strong pull, especially in the GCC subregion, which has a high number of immigrants both in net numbers and as a proportion of the total population. Migration to GCC countries and, to a lesser extent, Jordan and Lebanon, has provided countless jobs for migrant workers and their families.¹⁴⁵ The average share of migrants in the GCC states of the total population in 2020 was 53%, ranging from a low of 39% in Saudi Arabia to a high of 88% in the United Arab Emirates.¹⁴⁶ The United Arab Emirates, Qatar and Kuwait ranked first, second and third worldwide, respectively, with the largest proportions of migrants in their population.¹⁴⁷ The number of migrants going to all GCC countries is also much larger than the number of those originating from GCC countries, owing to the relatively smaller number of GCC nationals and their low emigration rates.¹⁴⁸ In 2020, the main country of origin of migrants to the GCC was India (31%), followed by Bangladesh and Pakistan (each at 11%).¹⁴⁹ While the migration of these workers to the GCC is nothing new, there is broad consensus that the impact of climatic factors in migrants' home countries - both within and outside of the region - is accelerating this movement.¹⁵⁰

Another form of inter-regional voluntary mobility, albeit in significantly lower numbers, is the movement of GCC nationals to Europe and other locations (including Jordan) during the height of summer in order to escape the worst of the heat. This remains the domain of the most wealthy, with the highest carbon footprint, using their resources to escape from climate impacts. Interviews point to this form of mobility as an upward trend.¹⁵¹

Alongside this regularised movement is movement outside of the region through *irregular routes* by a small minority of individuals - a form of movement which, as has been documented elsewhere, has led to a disproportionate response from global north states.¹⁵² In particular, the failure to find durable solutions for forcibly displaced populations has led to a minority of individuals attempting the journey to Europe in order to find their own durable solutions to their displacement.¹⁵³

¹⁴² Abbott and Stivachtis (2019), Op. cit.

¹⁴³ The 2016 Arab Human Development Report concluded that the current Arab youth population is "the largest, the most well educated and the most highly urbanised in the history of the Arab region". UNDP (2016). Arab Human Development Report 2016: Youth and the Prospects for Human Development in a Changing Reality. New York.

¹⁴⁴ Keynoush (2023), Op. cit.

¹⁴⁵ ILO. [Labour Migration in the Arab States](#)

¹⁴⁶ ESCWA (2022). [Situation Report on International Migration 2021: Building forward better for migrants and refugees in the Arab region](#)

¹⁴⁷ Ibid.

¹⁴⁸ Ibid.

¹⁴⁹ ESCWA (2024). [Migration and climate change in the Arab region](#)

¹⁵⁰ Ibid.

¹⁵¹ Klls

¹⁵² See, for instance, Hovil, L. and Maple, N. Local Integration: A Durable Solution in need of Restoration? Refugee Survey Quarterly, Volume 41, Issue 2, June 2022, Pages 238–266.

¹⁵³ Ibid.

Al-Bidoon: climate impacts on a stateless, mobile minority

The Al-Bidoon¹⁵⁴ are a stateless Arab minority, representing one of the largest populations of stateless people in the world,¹⁵⁵ the majority of whom currently live in Kuwait and Saudi Arabia.¹⁵⁶ Mobility has been intrinsic to the livelihood strategies of the Al-Bidoon. As they become increasingly immobile - both as a result of climatic and environmental challenges, but also as a result of political restrictions - access to livelihoods is reduced. This population will be at greater risk from the fatal consequences that higher temperatures, flooding and more severe dust storms bring.¹⁵⁷ In Saudi Arabia, water scarcity is increasingly impacting the majority who rely on agriculture for their livelihoods, and the situation is expected to worsen: droughts and desertification will make it more difficult for pastoralists to raise livestock; and the predicted rising sea levels and coastal flooding are likely to impact those living in coastal communities.¹⁵⁸ Most live in informal settlements with inadequate housing and infrastructure and lack legal recognition and protection - no longer able to be nomadic.¹⁵⁹ In the context of growing climate change impacts, what are the prospects for the Al-Bidoon?

Climatic and environmental factors not only play a role in driving migration, but they also impact the lives of migrants. While much of their movement might be termed 'voluntary', the conditions in which many operate upon arrival in the Middle East are often highly suboptimal or even abusive. Migrant workers are employed in a variety of sectors, including the oil and gas industry, agriculture, transportation and hospitality, but the largest number by far are found in construction and domestic work, where workers are also more likely to be lower-skilled and at the risk of abusive practices.¹⁶⁰ The kafala system, a sponsorship system intended to regulate the relationship between employers and migrant workers, leaves many migrants reliant on their employers for residency status; and assault and sexual violence against domestic workers have been well documented.¹⁶¹ In addition to abusive and fraudulent recruitment practices and the high costs associated with labour migration, other challenges identified in the literature include poor work conditions; limited/weak access to justice; and limited or no freedom of association.¹⁶²

Many of these risks are exacerbated or highlighted by climatic factors. For instance, many migrants live in informal settlements that lack infrastructure, that are not conducive to high temperatures, and that are in areas particularly prone to flooding or other environmental challenges.¹⁶³ One study has documented how communities in Nepal where significant numbers returned to, are seeing "an epidemic of chronic kidney disease".¹⁶⁴ The medical care required, including lifelong dialysis, is expensive "and can tip families into debt far greater than the wages that the migrant could have earned as a construction worker abroad."¹⁶⁵ Likewise in Dubai, migrant construction workers on the COP28 site "were put to work outdoors in extreme heat that posed very serious threats to their health and could be fatal, and in clear violation of the United Arab Emirates' laws designed to protect outdoor workers from its harsh climate." Due to pressure to get work finished in time, workers had to work through the heat of the day during the summertime 'mid-day ban'.¹⁶⁶ There is ample evidence to show, therefore, that the region is not 'a safe climate haven', and labour protections in Gulf states are typically weak.¹⁶⁷ Migrants are often positioned outside of adaptation mechanisms as a result.

¹⁵⁴ Meaning, 'those without nationality'

¹⁵⁵ Dargin, J. (2023). [Beyond "green pledges": Saudi Arabia and society-centred climate reforms](#). Carnegie Endowment for International Peace

¹⁵⁶ Minority Rights Group, [Bidoon in Kuwait](#)

¹⁵⁷ Sharp, DS et al. (2021). [The Quiet Emergency: Experiences and Understandings of Climate Change in Kuwait](#), LSE Middle East Centre

¹⁵⁸ Dargin (2023), Op. cit.

¹⁵⁹ Ibid.

¹⁶⁰ ILO, Op. cit.

¹⁶¹ Gawayed, H (2022). [Climate Change and Migration in the Middle East and North Africa](#). Arab Centre

¹⁶² ILO, Op. cit.

¹⁶³ ESCWA (2024), Op. cit.

¹⁶⁴ Iskander, N (2023). [Forging a Closed Loop: The intersection of climate change, migrant labour, and the conditions of work at the World Cup in Qatar](#).

Institute for Advanced Study

¹⁶⁵ Ibid.

¹⁶⁶ FairSquare (2023). [New Briefing: Cop28 Site Workers At Critical Risk Of Serious Heat Injury](#)

¹⁶⁷ Gawayed (2022), Op. cit.

3.4 Forced immobility

Less prominent in the literature is the issue of forced immobility. Despite its relative lack of visibility, it is clear that a number of factors are creating increasing numbers of individuals and communities that are, in effect, forced to remain where they are living, even in contexts where temporary or permanent movement would previously have been a vital coping mechanism. This category has relevance both for populations that are increasingly impacted by climate and environment but are still living in their communities of origin, and for populations that have been previously displaced.

Yemen - forcibly displaced then forcibly immobile?

The impact of climate change was a challenge in Yemen prior to the civil war. Temperatures are rising more rapidly than the global average; and water resources, agriculture, food security, coastal areas, and coastal infrastructure are at risk. Climate-related hazards include cyclones and floods; landslides; drought and desertification; sea-level rise.¹⁶⁸ Ten years of fighting have further stressed limited resources. The disintegration of basic government services, as well as blockades by warring factions, have compounded existing water and food shortages.¹⁶⁹ The 'weaponization' of water has also exacerbated the acute famine in Yemen and prolonged conflict.¹⁷⁰

Approximately 4 million people have become internally displaced in Yemen over the past 10 years due to a combination of the conflict and associated deterioration in rural conditions, including limited access to water, electricity, markets and basic services. Many IDPs live in precarious circumstances in make-shift camps and informal settlements or in urban areas, which increases pressure on infrastructure in urban areas.¹⁷¹ Others are living in temporary homes in low-level areas that are prone to flooding, particularly in coastal areas, leaving them vulnerable to unpredictable weather patterns. Many are increasingly using negative coping strategies to cope with lack of livelihoods, including selling off remaining assets and sending individual family members to nearby cities or abroad, especially to GCC states.¹⁷²

Significant tensions have developed over scarce natural resources between IDPs and populations who were already living on or near the land. The current situation is becoming increasingly untenable for many IDPs, yet return is not an option. In addition to the impact of the conflict on both security and infrastructure, many were displaced 9 years ago and have had children since then. Any return to their home area, which for many is in the more mountainous regions of the country, would be difficult as they would have minimal or no land to cultivate, leaving an increasingly vulnerable population immobilised.

In the case of the former, a number of reports make mention of the fact that across the region there are likely to be populations that have depleted their resources and are unable to move even if they wanted to - and, therefore, that climatic factors prevent migration as well as cause it.¹⁷³ While there is a lack of strong empirical data on this issue, there is a broad recognition of the fact that it is likely to be a reality for many communities in different parts of the region. One of the key findings of a report commissioned by the United Kingdom (UK) government in 2011, for instance, was that "environmental change is equally likely to make migration less possible as more probable." This, the authors argue, is because migration is expensive and requires forms of capital, yet populations who experience the impacts of environmental change often see a reduction in the very capital required to enable a move.¹⁷⁴ While their forced immobility might, eventually, lead to forced displacement, it is clear that as they conclude, these 'trapped' populations are likely to be as much a policy concern as those who do migrate.¹⁷⁵

¹⁶⁸ YFCA (2023). [Climate Change Impacts on Yemen and Adaptation Strategies](#)

¹⁶⁹ Norman (2023), Op. cit.

¹⁷⁰ Ibid.

¹⁷¹ Kyungmee, K et al. (2023). [Climate, Peace and Security Fact Sheet: Yemen](#). SIPRI

¹⁷² Norman (2023), Op. cit.

¹⁷³ The case of the Al-Bidoon (see box) is one example of this.

¹⁷⁴ The Government Office for Science (2011). [Foresight: Migration and Global Environmental Change. Final Project Report](#), p. 2

¹⁷⁵ Ibid.

In the case of the latter, and perhaps somewhat counter-intuitively, one of the trapped population groups identified by this study are those living in protracted displacement - populations of displaced people, both refugees and IDPs, whose lives are becoming increasingly perilous but who have nowhere else to go. Failures around durable solutions¹⁷⁶ have left many, in effect, stuck - unable to return home, unable to create livelihoods where they are living, but with little option but to stay due to lack of resources and/or an uncondusive policy environment to move elsewhere.

Many of these displaced populations, mainly living in Iraq, Jordan, Lebanon and Yemen, are in areas that are experiencing the brunt of climate-related challenges, for instance in flood-prone, dry or agriculturally poor land that was previously uninhabited - for good reason. At the same time, their presence is often seen to have put significant pressure on scarce resources and to have escalated environmental degradation. For many, these factors have often increased their need to move, but also made their inability to do so more acute. While it has driven some secondary movement and potentially acted as a push factor for return, more often it has kept populations trapped in displacement - and therefore in a holding pattern of immobility.

While there is significant literature on the negative environmental impact of refugees in both camp and urban settings, it is also noteworthy that some displaced contexts have demonstrated the potential for, or implementation of, adaptation mechanisms. A positive example is in Azraq camp in Jordan, which is the first refugee camp in the world powered by renewable energy; and Zaatari camp, which switched to clean energy in 2021, using solar power.¹⁷⁷ However, these more positive examples do little to obscure the overwhelmingly negative realities of protracted, at times intergenerational, displacement and forced immobility.

3.5 Voluntary immobility

Alongside forced immobility, the evidence suggests that there are strong drivers for people to stay put out of choice, and many populations do not want to move. Despite the hardships that some are facing, mobility is either not being considered or is viewed as a last resort by many.¹⁷⁸ While every region is unique with regards to the impact of changing climatic factors, there is a growing awareness globally of the need to support people to stay at home,¹⁷⁹ and that movement away from home is often a measure of last resort.¹⁸⁰ In the context of the Middle East, this was seen to be particularly relevant where there is strong attachment to the land, and was also seen as more prominent among older generations.¹⁸¹ While the desire to remain at home is relevant for both internal and international migration, not surprisingly, it was particularly marked in the case of the latter. As a 2014 World Bank study argued, while international migration can be conceived of as “a form of adaptation”, it is often seen as a solution of last resort by households - it is seen as more costly than other strategies (eg using savings, selling assets etc), and it implies substantial risks due to unknown outcomes for both the person who migrates and those who stay behind (if remittances are limited for whatever reason).¹⁸²

Therefore, the emphasis in the literature is on promoting adaptation and resilience that allows people to stay, albeit recognising that this is taking place with often dwindling resources and options. The literature also recognises that voluntary immobility might eventually not be possible, particularly where adaptation capacity is limited and resilience has been worn down by repeated episodes, for instance, floods or droughts. People will likely stay on their land as long as is viable, with adaptation generally prioritised over movement. Whether or not they are able to then move to seek alternatives remains an open question.

¹⁷⁶ Hovil and Maple (2022), Op. cit.

¹⁷⁷ UNHCR / Columbia Global Centres (2021). [Third Middle East and North Africa Academic Roundtable: Climate Change and Displacement in MENA Outcome Report](#)

¹⁷⁸ KII.

¹⁷⁹ Kaldor Centre (2023). [Principles on Climate Mobility](#)

¹⁸⁰ Ibid. (6) In the Pacific region, for instance, where many communities are increasingly feeling the pressure of climate change, strong attachment to place means that even where people have been offered visas to move to NZ or Australia, many have not taken up the offer. In this context, local adaptation capacity is seen as the most important priority. Mortreux, C (2023). [Migration, evidence and climate change in the Pacific. East Asia Forum](#).

¹⁸¹ KII, February 2024.

¹⁸² World Bank (2014), Op. cit.

Iraq's marshlands: ecosystem collapse and population impacts

The Iraqi marshes are located on the floodplains of the Tigris and Euphrates rivers, bound by the cities of Basra, Nasiriyah, Amarah and a portion of southwestern Iran and northern Kuwait. The Marsh Arabs, the wetlands' indigenous population of Iraq, have fished and cultivated crops in the area for 5,000 years, raising water buffalo and building houses from reedbeds on floating reed islands.

Iraq has entered its fourth year of drought as Türkiye and Iran control upstream of rivers that supply almost all of Iraq's water. The weir built by Iran in 2009 along its border has dropped the water level in Huwaizah Marshes, especially in the drought season.¹⁸³ At the same time, mismanagement of resources within Iraq has played a role, and the country has also faced significant challenges to water infrastructure maintenance as a result of the United States invasion between 2003 and 2011 and later campaigns against ISIS.¹⁸⁴

Climate change, water pollution, oil exploration and the construction of upstream dams are threatening the survival of this delicate ecosystem and its ancient Mesopotamian culture, which some trace back to the Sumerians.¹⁸⁵ The Marshes had a rich ecosystem but it is collapsing due to a combination of "meteorological, hydrological, and political" factors, driving tens of thousands of Marsh Arabs to seek livelihoods elsewhere.¹⁸⁶ Those who remain often do so as a result of lack of alternatives, despite the challenges they face. For instance, in 2018, nearly 118,000 people were hospitalised in the area due to water-related illnesses.¹⁸⁷

3.6 Overlapping factors

While these four categories help to understand different forms of (im)mobility in the region, ultimately, there are a quagmire of factors that lead someone to move or stay. There is a fine line, for instance, between supporting people to stay at home and forced immobility in a situation where the predicament of trapped populations that are too poor to move (partly as a result of environmental stressors and/or the impact of climate change) intersects with social inequalities and poor policy making. For instance, bad governance leads to poor decision-making in climate-vulnerable areas; which leads to increasing depletion of resources and less ability to adapt; which is possibly exacerbated by a particular climatic or environmental event or factor. These findings resonate with a global discussion that recognises the extent to which climate intersects with other factors to influence mobility in a context in which "climate mobility is neither uniform nor linear".¹⁸⁸

¹⁸³ Crisp, W (2023), [After Comeback, Southern Iraq's Marshes Are Now Drying Up](#), Yale School of the Environment

¹⁸⁴ Marwa Daoudy (2023), Op. cit.

¹⁸⁵ OHCHR (2023), Op. cit.

¹⁸⁶ Crisp, W. (2023), Op. cit..

¹⁸⁷ Ibid.

¹⁸⁸ Kaldor Centre (2023), Op. cit.

Gaza: extremes of vulnerability

Palestine faces significant climatic challenges, including a decrease in precipitation (with significant seasonal variation) and significant warming.¹⁸⁹ Declining availability and quality of water will have a significant impact on agriculture, which has been described as the bedrock of Palestinian society.¹⁹⁰ At the same time, rising sea levels, projected to be as high as a metre by 2050, will also have an impact - not only damaging beaches, but also damaging its desalination plants and undermining the sewage and drainage systems of many coastal cities.¹⁹¹ Prior to the most recent outbreak of conflict, only 4% of households had access to safely managed water in Gaza.¹⁹² One author argues that "Israel's climate oppression does not only contribute to entrenching and maintaining its domination over Palestinian lands and natural resources, but also deprives Palestinians from the development of self-determined resilience strategies to mitigate and adapt to climate challenges."¹⁹³ As a result, issues such as scarcity of available water, deterioration of the water resources, land, and soil contamination, as well as desertification and unsustainable management of land, and air pollution all have an acute impact.

The human and environmental impact of Israel's recent bombing of Gaza has been immense,¹⁹⁴ and the current conditions in Gaza make environmental and climate change concerns a low priority. Yet assuming that hostilities will end and that there will be some efforts at reconstruction, mobility and environment-related issues will become critical. Indeed, Gaza offers an extreme example of an immobile population, many involuntarily so, with no options to leave Gaza to find safety elsewhere, that is further affected by climatic and environmental challenges. Many of those living in Gaza have already been displaced multiple times. Climate change impact may add an extra burden on already limited resources and mobility options, in a normal case scenario let alone a post-conflict reality.

Furthermore, they point to the fact that climatic and environmental challenges both have an impact on migration by creating new or increased mobility and immobility dynamics; and have an impact on existing displaced or migrant populations. While it is hard to tease the different and shifting components apart, the findings make clear that there is a current trajectory in which linkages between climatic factors and the mobility or immobility of people is becoming an increasingly salient issue. While the precise categorisation of this movement is constantly shifting, there is strong consensus around the multiplicity of factors that lie behind it - even if there is less clarity on how these different factors are weighted.

¹⁸⁹ UNDP/PAPP (2023). [Climate Change Adaptation Strategy and Programme of Action for the Palestinian Authority](#)

¹⁹⁰ Agha, Z (2019). [Climate Change, the Occupation, and a Vulnerable Palestine](#). Al-Shabaka: The Palestinian Policy Network

¹⁹¹ Baker, A (2023). [The Israeli-Palestinian Conflict Is Also a Looming Climate Disaster](#). TIME USA

¹⁹² United Nations in Palestine (2022). [Fact Sheet on Environment in Palestine](#)

¹⁹³ OHCHR / AI-Haq (2021). [Climate Oppression: A Major Tool to Establish and Maintain Israel's Apartheid Regime over the Palestinian People and Their Lands](#)

¹⁹⁴ Indlieb Farazi, S (2023). [Is Israel's Gaza bombing also a war on the climate?](#) Al Jazeera Media Network

4. Linking climate change impacts and mobility: key findings

The Middle East is already witnessing climate variability and extremes and is expected to be one of the regions hardest hit by the impact of climate change in years to come. This will be manifested through declining water availability, increased high-heat days, humidity extremes, dust storms, cyclones and storms, coastal flooding, sea level rise, desertification and loss of biodiversity. Mobility or immobility represents both a symptom of this reality, and a potential response to it. In other words, it can be both a form of positive adaptation, or a negative coping strategy (as in the case of forced displacement). Likewise, immobility is an indicator of both positive adaptation through demonstrating resilience and adaptation in place, or it can be a negative coping strategy, as in the case of involuntary immobility. Bringing these two realities together, the following section summarises a number of key findings.

First, while the study establishes **a clear relationship between human mobility and immobility and the impacts of climate change, the challenge is to understand the impacts of climate change on mobility in relation to other factors**, including conflict, lack of good governance, mismanagement of natural resources, availability of job opportunities and environmental degradation. This requires additional research that not only accounts for environmental and economical factors but delves deep into human behaviour and sociology.

Second, **the degree of impact that climate change has on mobility or immobility can vary from one situation to another, depending on a range of factors such as the intensity of climatic variability and extremes, their longevity, and the prevailing level of resilience and preparedness within a certain region**. It is also evident that impacts from climate change exacerbate the intensity of other factors contributing to human mobility and could represent an important tipping point, triggering a significant increase in human movement, especially in rural communities where the impact on livelihoods is more apparent.

Third, **in cases of climate variability and extremes, people across the Middle East often prefer to stay within homes and communities** that are often closely knit, unless their livelihoods or safety are jeopardised. This can be observed particularly in communities that have already been impacted by climate variability and extremes, such as those that depend on land and agriculture, and areas affected by cyclones and severe storms. When their main source of income can no longer provide them with sustenance, their adaptation form of choice would be to move to areas they are familiar with, preferably in their home country. Thus, movement from rural areas to cities within the same region or country is expected to increase significantly. Regardless of what drives it, human movement will continue to place extra burdens on city infrastructure and is likely to increase the need for governments to create more economic opportunities, jobs and sustainable infrastructure in urban areas.

Fourth, for those who do move, **the vast majority stay within their country of origin** - or, at the very least, within the region. Movement outside of the region, therefore, is minimal, and policy and programmatic responses need to reflect this reality. A disproportionate focus on the few who migrate to other regions risks neglecting the areas where support is most needed.

Fifth, at a national level, **climate adaptation does not appear to score high on Middle Eastern government priority lists - even in more prosperous countries that have the resources to act**. Unless comprehensive climate adaptation plans are devised sooner rather than later, more people are likely to be forced to move or become trapped in increasingly vulnerable locations. This scenario, coupled with the intensifying impacts of climate change, will place even greater pressure on already strained resources and government capacities.

Yet, sixth, **the inequalities in the region are stark - both between countries, but also within countries**. For instance, the options facing the scores of Gulf Cooperation Council citizens who escape the soaring summer temperatures by travelling abroad and/or limiting the time they spend outdoors are in stark contrast to migrant workers, who often comprise a majority of the population in these countries, and who live in less favourable conditions and face the brunt of the harsh GCC climate; or to refugees and IDP populations across the region that have had their few resources depleted by years of displacement; and to farmers seeing dwindling returns and little by way of a safety net. GCC countries have the resources to act, but as long as wealthy populations are able to live comfortably with benefits such

as air conditioning, there is little incentive to change and achieve climate-smart adaptation measures that benefit everyone. At the same time, countries that are most dependent on agriculture (including Syria, Yemen and Iraq), which makes them more vulnerable to climate change impact, are facing challenges of conflict and corruption, and seem to be the least capable of adaptation, let alone building resilience. Ultimately, inequalities and experiences of climate-related mobility are also likely different according to age and gender, as well as geography, displacement status, wealth and type of livelihood, although more research is needed to be done to explore these areas.

In sum, this picture points to growing concerns of over-stretched resources; growing (or more apparent) inequalities; inadequate infrastructure development in line with population growth; and increased pressure on available agricultural land to feed a growing urban population.

Inevitably, all of this is having an impact on populations' mobility and immobility. Yet the findings also point to a general dearth in disaggregated data on the linkages between climate impacts and mobility - albeit with a few exceptions. It has created a lack of nuance in understanding of what people are thinking and doing in response to climatic challenges and how this differs among different population groups. This has then led to a tendency for generalisations and assumptions to dominate in many discussions, which are difficult to transform into informed and effective programming and policy.

Yet, set against this somewhat bleak picture, there is considerable scope for integrating human mobility into climate strategies and policies,¹⁹⁵ both in countries that have already developed their national adaptation plans and in those that have not yet done so but are under increasing global pressure to do so. There is a need to revise climate governance structures in a systematic manner to ensure that the legal mandate, enforcement system and funding mechanisms are all in place, while empowering the environmental community within each country to be listened to, and to act. Ensuring a sufficient empirical base from which to do so is critical in this regard.

In light of these findings, a number of areas for future research have been identified. While by no means exhaustive, they cut across both geographic and thematic areas that would particularly benefit from in-depth (field) research.

¹⁹⁵ Wright, E, Tänzler, D and Rüttinger, L (2020). [Migration, environment and climate change: Responding via climate change adaptation policy](#)

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Annex: Summary of the validation workshop

A draft version of this report was shared with regional experts for discussion during a validation workshop in Amman, Jordan, in April 2024. The half-day workshop welcomed participants from NGOs, UN agencies, the Red Cross Red Crescent movement, donor governments, and academia, with expertise from across multiple sectors and geographies in the region. All were invited to discuss and comment on the report and its key findings and advise on the implications of the findings for future research on climate mobility in the region. This summary outlines major points made during the discussion and will be taken into account when designing MMC's future work.

There was consensus around the **relevance and even urgency of developing the evidence base** on this complex topic. Climate change impacts can enter into every sphere of life, and how they affect people often depend on a complex interplay with multiple other factors. The influence of climate change impacts on people's thinking about mobility – which we know is most often driven by multiple factors – is therefore extremely challenging to both trace and isolate. Yet a framework or matrix that does trace these interactions would be valuable for planning targeted responses.

One key intervening factor is policy. It does not make sense to talk about climate change impacts without considering the influence of government policies on mediating or aggravating those impacts. Similarly, it is difficult to discuss mobility decision-making without a clear picture of government policies on migration. However, this is no easy task, as climate change and mobility are affected by the decisions made in multiple policy areas.

The perspective of communities is vital for effective climate response. While climate data are important, and more specific data are needed, responding to climate change impacts in a way that empowers communities requires a knowledge of both **if and how communities are thinking about and responding to climate change impacts.** Too often, the communities most affected by climate change are marginalised or even blamed for the damage. Yet they often lack sufficient power to act, and their valuable traditional or local knowledge is overlooked by researchers and responders.

In between community perspectives and national policy, **the role of local leaders and local government structures** also deserves attention, since they often hold considerable influence over the potential for adaptation. This is particularly pertinent regarding the role of **climate change impacts on urban dynamics.** Many people who leave rural areas for climate-related reasons head to the city, and cities are struggling to cope. New arrivals often settle in informal settlements which themselves are more exposed to climate change impacts or environmental degradation, with poor access to services. We need to understand these dynamics better, so that cities can plan for, and respond to, not only a growing population but also the climate change impacts on their populations.

The Middle East hosts a large refugee and internally displaced population; and many countries in the region have, or continue to witness, armed conflict. This is particularly challenging when considering climate mobility in the region, with a large population affected by conflict, as well as a population affected by climate change. While it is certain that conflict causes environmental degradation, reduces adaptive capacity, and increases vulnerability to climate change impacts, there is considerable uncertainty over how climate change and conflict interact.

While the report focuses on common findings across a diverse region, workshop participants underlined **the specificity of individual contexts.** Indeed, the complex interplay of factors around climate mobility outcomes means that each context is unique in terms of policy, climate challenges, political profile and socioeconomic environment. And the interplay between them differs. Furthermore, within each context, different population groups will be affected – and will respond – differently: gender and age are priority areas for consideration in this regard. Therefore, more research is needed to understand particular populations and climate mobility.

Temporality was also discussed. Climate mobility is happening now – it is not a future eventuality that we need to prepare for. At the same time, climate mobility dynamics are expected to change in the future, and while we need to start responding already, we also need to prepare for those changing dynamics. Finally, we need **knowledge that can inform – and even prompt – action.** While here a repository of data exists, as do numerous documents and strategies, implementation and action are falling significantly behind. Further research, therefore, must be designed to facilitate action.

MMC would like to thank Expectation State for their research and facilitation of the workshop, and FCDO for its financial support, and the participants for their active engagement and thoughtful contributions to a lively discussion.



MMC is a global network engaged in data collection, research, analysis, and policy and programmatic development on mixed migration, with regional hubs in Africa, Asia and the Pacific, Europe and Latin America, and a global team based across Copenhagen, Geneva and Brussels.

MMC is a leading source for independent and high-quality data, research, analysis and expertise. MMC aims to increase understanding of mixed migration, to positively impact global and regional migration policies, to inform evidence-based mixed migration responses for people on the move and to stimulate forward thinking in public and policy debates on mixed migration. MMC's overarching focus is on human rights and protection for all people on the move.

MMC is part of the Danish Refugee Council (DRC).

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