

EPICENTERS OF CLIMATE AND SECURITY: THE NEW GEOSTRATEGIC LANDSCAPE OF THE ANTHROPOCENE

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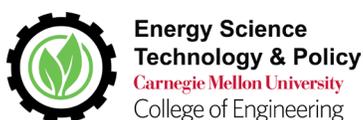
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MIGRATION AND DISPLACEMENT IN A CHANGING CLIMATE

Robert McLeman¹

The physical impacts of climate change are set to become the fastest-growing driver of involuntary migration and displacement globally, beginning in the middle of this century. Climate change is exerting a growing influence on voluntary migration within states and between contiguous countries as households adjust and adapt to shifting local environmental conditions and fluctuations in food and water availability. The greatest concentrations of climate change migrants and displaced people in the future will likely be situated in (1) dryland regions with highly seasonal precipitation regimes, (2) in heavily populated, low-lying coastal areas that regularly experience tropical cyclone activity, and (3) on atolls in the Pacific and Indian oceans (although this is a dynamic that will likely be felt globally). The impacts of climate change on people living in such environments will likely be exacerbated by rapid population growth, declining per capita global food supplies, and growing per capita water scarcity. The large-scale migrations and displacements that emerge may undermine development in the world's poorest countries, swell urban populations to the point that many cities may become ungovernable, erode confidence in government institutions, and undermine peace and stability.

The outcomes just described are not inevitable but grow increasingly likely given the current absence of meaningful international investments to build adaptive capacity. The next 20 to 30 years are a critical period for action. Concerted cooperation among governments, communities, the private sector, and civil society will be needed to change our current trajectory toward a future of disruptive, climate-driven migration.

A SNAPSHOT OF CURRENT GLOBAL MIGRATION

A first step in changing trajectories is to understand why people migrate in the first place.² Most people who migrate do so for one or more of the following three reasons. First are economic motivations, with people moving to take advantage of labor market and financial opportunities or to pursue education and training. Sometimes this migration is permanent, other times it isn't. For example, in dryland countries in sub-Saharan Africa, young adults often migrate out of the countryside during the dry season, seeking temporary employment in nearby cities until the rains return and their labor is again needed at home.³

Second, various social and cultural incentives, such as family obligations, lifestyle preferences, and societal expectations, contribute to migration. Often, these social and cultural considerations overlap with economic factors. For example, in many dryland and mountainous regions, nomadic and semi-nomadic pastoralism is simultaneously an economic practice and a source of social and cultural identity for those who practice it.⁴

Third, exogenous factors pressure people into migration that they would not otherwise undertake. These include acts of violence, persecution, conflicts, and political instability, as well as natural disasters and government-enforced resettlement to make way for development and infrastructure projects. Involuntary migration for political reasons is currently at its highest level in 20 years, with more than 16 million people currently recognized as requiring refugee protection under the United Nations mandate.⁵ Over half of all refugees globally are products of conflicts and political instability in just three countries – Afghanistan, Somalia, and Syria. The number of people displaced by natural disasters varies considerably from one year to the next but is significant; the International Disaster Monitoring Centre reports that since 2008, an average of 26 million people annually have been displaced by disasters.⁶

Migration tends to flow in particular directions; rarely does it take the shape of random movements of people. In less developed countries, most migration takes place within national borders and flows from rural areas and smaller communities to larger cities.⁷ Depending on local environmental conditions and land-use practices, there can also be large flows of labor migrants between rural areas. When urban economies contract or collapse, migration can flow from the city to the countryside, although historically this phenomenon has been relatively uncommon, localized, and usually temporary.⁸ International migration is less common than intra-national migration, with most international movements taking place between countries that share contiguous borders. The UN Department of Economic and Social Affairs estimates there are currently 220 million people worldwide who have moved out of their respective countries of origin. To put this into perspective, it is estimated there are more than 200 million internal migrants in China alone.⁹ Although large-scale, long-distance migration events such as the 2015-2016 movement of more than a million people to Europe from the Middle East and Africa have dominated media and policymaker attention, most international migration to date occurs among less developed countries in the global South.¹⁰

It is also worth noting an important category of people researchers describe as "rapped populations," that is, people who would migrate out of challenging circumstances but lack the means to do so.¹¹ Such groups may be found, for example, in locations exposed to natural hazards such as floods and landslides, in highly polluted environments, and in locations with degraded agricultural soils.

Climate change will affect all of the aforementioned types of migration and immobility. Of particular concern is its potential to stimulate larger movements of internal and international migration across a range of geostrategically important regions.

HOW CLIMATE CHANGE ALTERS GLOBAL MIGRATION PATTERNS

The preceding snapshot of global migration patterns is set to change in four ways as a result of climate change. First, many regions will experience increasingly severe tropical storms and associated flood events¹² that generate larger volumes of internal displacement and migration. The evidence for this is found by studying the outcomes of extreme storms in recent decades, including Hurricane Mitch (Central America, 1998), Hurricane Katrina (United States, 2005), Cyclone Aila (Bangladesh, 2009) and Typhoon Haiyan (Philippines, 2013). In each case, the storm was followed by a churning pattern of migration as people struggled to recover from damaged housing and lost livelihood assets.

Governments and relief agencies were not able to cope with the scale of homelessness and displacement, leaving many people dependent on extended family networks and informal organizations such as church groups for emergency shelter and support. Large numbers of young adults migrated out of storm-hit areas in search of short-term job opportunities, hoping to remit money home to help rebuild their family's lost or damaged property. This phenomenon shows up, for example, in U.S. immigration statistics in 1999, which reveal a sudden surge in Honduran nationals apprehended entering the country clandestinely via Mexico following Hurricane Mitch (Figure 1).

The likelihood of people returning and resettling in storm-hit areas depends on the extent of damage to housing stocks and basic infrastructure; as seen in Figure 2, the population of New Orleans did not fully recover following Hurricane Katrina. The number of people at risk of displacement by future storms in the Caribbean basin, along the southeastern U.S. Atlantic coast, and in large river deltas of south and southeast Asia will be augmented by rapid population growth in exposed areas, a result of the combined effects of natural population increase and high rates of in-migration and urbanization.¹³

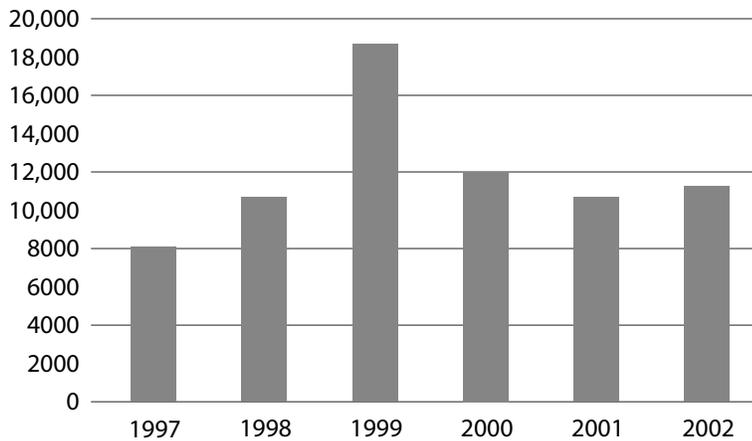


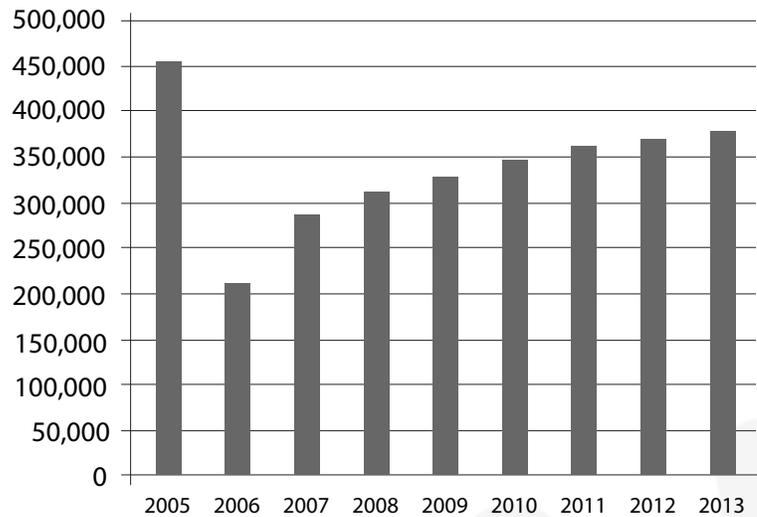
FIGURE 1: Undocumented Honduran nationals intercepted entering the US from Mexico

NOTE: Hurricane Mitch struck Honduras in late 1998.

DATA SOURCE: US INS statistical yearbooks 1998-2003.

FIGURE 2: Population of New Orleans before and after Hurricane Katrina, 2005

DATA SOURCE: US Census



Rising sea levels present an additional set of risks to coastal populations. The current global rate of mean sea level rise (MSLR) is estimated at just over 3mm per year, and appears to have accelerated in recent decades.¹⁴ Scientists warn that if global average temperatures rise by more than 2°C from pre-industrial levels – as will occur around 2050 if global greenhouse (GHG) emissions continue on current trends – a sea level increase of a half-meter or more by 2100 becomes likely in many parts of the world.¹⁵ While tens of millions of people living in the lowest-lying areas will be threatened with permanent inundation by the end of the century, a more pressing threat is that even modest MSLR facilitates the inland penetration of storm surges and king tides, raising the risks of storm damage to property and the salinization of coastal agricultural lands and groundwater.

Such risks are particularly concerning for populations living on coral atolls in the Indian and Pacific oceans, especially those atolls that are subsiding tectonically or are erosion-prone.¹⁶ In densely populated coastal deltas in Asia, MSLR is exacerbated by the pumping of groundwater, which accelerates the compaction of loosely consolidated sediments. The result is that in places such as Shanghai and the Ganges-Brahmaputra delta, the relative rate of sea level rise is more than double the global average.¹⁷ Wealthier nations will be able to offset such risks by constructing flood barriers and sea walls, such as those that already protect Venice, the Thames estuary, and the Dutch coastline. But less developed nations may be obliged to adopt a strategy of planned relocations from low-lying coastal areas. In the case of atoll nations, there may be no place to retreat to, forcing their populations to seek relocation to other nations.

A third driver of migration and displacement will be changes in regional precipitation patterns, greater dryness in arid and semi-arid regions, and increased frequency and/or severity of droughts. These impacts are expected to be highly variable across and within regions, and climate models do not currently provide reliable, local-scale projections of future precipitation patterns in parts of Asia that experience monsoonal precipitation.¹⁸ The most at-risk regions are those that are simultaneously unstable climatically, are easily susceptible to land degradation, and have disproportionately large rural populations – a description that applies to large dryland areas in South Asia, western China, Sahelian Africa, Central America, and eastern South America.¹⁹ Agricultural productivity will become increasingly erratic, and surface water and ground water resources will decline. A low-end estimate is that 500 million people worldwide will face increased water scarcity by mid-century, the majority living in the aforementioned regions.²⁰ The already growing rates of migration and urbanization within these regions will accelerate as households and communities adjust and adapt their livelihoods to shifting climatic conditions, causing urban populations to swell.

The fourth way in which climate change will affect future migration patterns is an indirect one: it will place greater stress on food prices. Climate change is expected to have adverse impacts on global agricultural productivity, with knock-on effects on the GDP of less developed nations and on the welfare of the poor.²¹ Food production and distribution systems are increasingly interconnected on a global scale, meaning that climate change-related fluctuations in agricultural production in one region stimulate price increases in other regions.²² The number of people experiencing food insecurity and undernourishment will grow significantly by mid-century because of climate change, with one study estimating an additional 1.7 billion people being in such circumstances.²³

Short- and long-term migration rates will expand accordingly in less developed countries as households and communities seek to diversify their income sources and stabilize their access to food supplies. Further, wildly oscillating food prices and decreasing household food security can contribute to greater societal instability, urban unrest, and decreasing

confidence in government institutions.²⁴ This dynamic was witnessed across much of North Africa and the Middle East during the 2011 “Arab Spring” in countries where market structures and high levels of food imports transmit global food-price increases rapidly to households.²⁵

CLIMATE CHANGE, MIGRATION, AND CONFLICT

The relationship between climate, migration and conflict is complex and not linear, as shown in recent studies on the role of drought as a factor within the Syrian conflict and subsequent large-scale migration to Turkey and onward to Europe.²⁶ The direct causes of conflicts cannot be solely attributed to climatic conditions or climate-related scarcity of food, water, or other resources. Rather, climate change adds an additional layer of stress that can increase state fragility and the likelihood of conflict.²⁷ This happens because adverse climate conditions undermine household livelihoods, heighten socio-economic disparities, and generally serve to increase poverty in affected areas. In this way, the impacts of climate change promote higher rates of population movement, elevate existing social and political tensions between communities, and, therefore, have the overall effect of exacerbating existing conflicts and creating greater potential for new ones.²⁸ This in turn increases the potential for greater future movements of refugees and forced migrants. However – and this is critical – conflicts and refugee crises do not automatically form in such situations, and the people who flee are typically victims of violence and not perpetrators of it.

States that are already politically fragile are the most likely future epicenters for climate-related violence and forced migration events. Of the 20 highest ranked countries on the Fund for Peace’s current *Fragile States Index*, 12 are situated in areas of the Middle East, South Asia, and Sahelian Africa where climate change is expected to create heightened levels of water scarcity, and three – Afghanistan, Somalia, and Syria – currently account for more than half the world’s current refugee population (Table 1).²⁹

Country	Ranking on 2016 Fragile States Index
Somalia	1
South Sudan	2
Sudan	4 (tie)
Yemen	4 (tie)
Syria	6
Chad	7
Afghanistan	9
Iraq	11
Pakistan	14
Eritrea	18
Niger	19
Kenya	20

TABLE 1:
Water-scarce countries ranked in the top 20 of the Fragile States Index

NOTE: Large areas of northern Nigeria (ranked 13th on the FSI) are also at risk of greater water scarcity in coming decades.

SUMMING UP

Climate events and conditions have always had the potential to affect migration and are set to become a dominant influence on regional and global migration in the second half of this century. Epicenters of climate-related migration and displacement will emerge in many locations globally, but especially in densely populated, low-lying coastal areas on most continents, particularly those in tropical cyclone belts; on small island states in the Pacific and Indian Oceans; and in dryland areas in sub-Saharan Africa, the Middle East, South Asia, and western China. The key direct drivers will be increased severity of extreme weather events, rising sea levels, increased precipitation variability and elevated drought risks. The impacts of climate change on global food production and food prices will depress household incomes in less developed nations, which will in turn stimulate increased migration as people seek to diversify their livelihood and income sources. Urban unrest and political stability may also follow, especially in states that already have weak institutions and pre-existing conflicts. Avoiding large-scale involuntary migration and displacement will require concerted and coordinated action to build adaptive capacity and create policies and programs to protect and assist those who are in harm's way.

NOTES

1 Wilfrid Laurier University, Waterloo, Canada

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5 Note that the 16 million figure is based on 2015 year-end-statistics, the most recently available at time of writing, and does not include 5 million long-term Palestinian refugees registered with the UNRWA. Source: Accessed at <http://www.unhcr.org/statistics/unhcrstats/576408cd7/unhcr-global-trends-2015.html>

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