

# Water, migration and how they are interlinked

The world is witnessing some of the largest refugee flows since the Second World War. Meanwhile, water crises are highlighted as one of the most pressing global challenges. In this context, migration and refugee flows are increasingly explained in terms of water scarcity – perpetuated by climate change. This Working Paper argues that easy answers to complicated questions should be avoided, and that deeper analysis is needed.



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# Water, migration and how they are interlinked

By Anders Jägerskog and Ashok Swain

At a time when we are witnessing some of the largest refugee flows since the second world war, and water crises are being highlighted by the World Economic Forum in their 2016 Global Risks Report (WEF, 2016) as the most important concern for the coming decade, the importance of trying to understand the linkages between water and migration is widely accepted. Increasingly, researchers and policymakers are seeking to explain migration and refugee flows in terms of water scarcity – often perpetuated by climate change. We argue for caution and deeper analysis, and not to look for “easy” answers to complicated questions.

Historically, migration and water were related, broadly, to nomads and pastoralists looking for water and food for their animals. Nomads on the African continent, in the Middle East and Asia often lived a life where they moved in accordance with where they could sustain a livelihood for themselves. The new debate tries to see linkages between water scarcity (which includes natural va-

riability), migration (and refugee flows), and conflict. We argue that it is important not to draw hasty conclusions in terms of causal linkages in this respect. The availability of freshwater has also fallen short of adequately meeting its increased demand in most parts of Asia, Africa and the Middle East. Nearly two billion people in the world lack access to clean water and more than two billion do not have adequate sanitation facilities.

The loss of livelihood due to increasing water scarcity and variability could force those affected to migrate. Furthermore, the water scarcity is becoming much more problematic (e.g. through increased variability of flow with subsequent vulnerability) due to global climate change. Climate change may also potentially alter rainfall patterns, which may lead to increased flooding, drought, and soil erosion in tropical and arid regions of the world. In that sense, climate change is exacerbating pre-existing phenomena such as natural climatic variability.



Photo: iStock

## How changing water supplies can contribute to food insecurity

By: Andrew Maddocks, Betsy Otto and Tianyi Luo, World Resources Institute

When social unrest erupts, especially at a scale that causes migration, it is nearly impossible to identify a single cause. Water scarcity, however, is cited with increasing frequency as a significant multiplying factor. One water-related driver that deserves further consideration is high water supply variability.

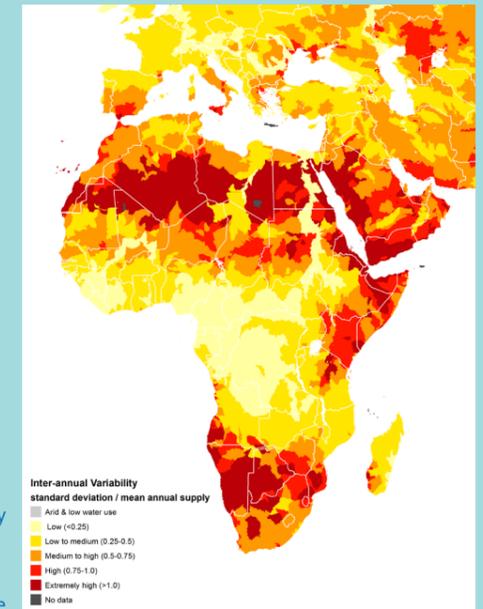
World Resources Institute's (WRI) Aqueduct Water Risk Atlas maps 12 water risk indicators worldwide. One indicator, inter-annual variability, measures how much surface water supplies change from year to year in given areas. Areas with high inter-annual variability have seen a significant change in available surface-water supplies over 60 years of historical averages. That variability can come in the form of periodic, extended droughts, which can cause serious humanitarian crises. These inter-annual swings are predicted to become more pronounced with climate change in many areas already prone to conflict or instability, such as the Middle East and parts of Africa.

Several are, in fact, playing out right now. In May 2015, an El Niño settled into the Pacific, raising ocean temperatures to their highest levels since 1997 and creating the strongest El Niño-influenced weather patterns in a decade. As of early 2016, southern and eastern Africa were still experiencing the associated drought. Dry soil and poor preparedness exacerbated the conditions, according to Simon Mason, a climate scientist at Columbia University, all of which created food shortages affecting millions of people.

Angola and Zimbabwe were among the worst affected areas, while Ethiopia

experienced one of its driest seasons of the past 50 years. In early 2016, South Africa reported its lowest annual rainfall on record, resulting in the country's smallest corn harvest since 2007 and raising the likelihood that it would need to import food. Areas within each of these countries experience high to extremely high inter-annual variability (see map), meaning that periodic droughts such as the current El Niño-influenced pattern are relatively common. These dry seasons can be devastating for people who depend on subsistence agriculture or are poor and particularly affected by rising food prices. Additionally, high water stress – competition among users for limited renewable surface water resources – can magnify periodic droughts' negative effects.

The current El Niño has not yet triggered documented migrations, but history suggests cause for concern. A devastating drought in Syria from 2006-2011 drove more than 1 million people into food insecurity and helped trigger a mass migration of 1.5 million people into cities. That wave, combined with exceptionally poor economic conditions, a political reform movement, and a violent uprising against a repressive political regime helped ignite Syria's ongoing civil war. Challenging agricultural conditions have also contributed to past migrations from Africa's Sahel drylands and Horn region, underscoring the link between water supply variability, food insecurity,



ry, the potential for unrest and mass migration.

Similar risks will likely increase in the face of growing populations, rising demand for resources and climate change. Changing precipitation patterns could reduce or disrupt historic patterns of rainfall and growing cycles, and diminish the water available for irrigation. The result will likely be lower agricultural yields and livestock productivity, directly affecting local food security and even global food prices. No country is immune to the risks.

The historical cases and future risks are significant. Understanding current and future water-food conflicts requires the best available data and early warning systems. Having the tools to understand that data, such as the inter-annual variability maps above, is an important first step.

The problem of so-called climate change-induced population migration is increasingly seen as one of the foremost crises of our times. To date, these concerns have tended to be viewed as peripheral. However, their sheer assumed size (with some projecting a possible displacement of one billion people), (Weiss, 2015), has now

brought them to the fore as one of the most important issues on the global political agenda. Food scarcity has already forced a large number of people to move across international borders. This phenomenon has been of growing concern to the international community, particularly because mass migration creates security concerns

for nation states. Still, these analyses provide, arguably, overly simplified answers to deeply complicated questions. There are often many reasons (including underlying push and pull factors), that cause people to flee or migrate. Often, the underlying reasons for the migration and refugee flows – such as poor governance, and water and land management – are often overlooked when analyzing the key reasons behind migration. Rather, it seems easy to blame drought and climate change, as has increasingly been the case.

Today, when we have seen a major flow of refugees from war-torn Syria (and Afghanistan and Iraq) to neighbouring countries, as well as increasingly to Europe, more questions have been raised about the linkages between conflict, water scarcity, climate change, droughts and migration. According to the UNHCR, 4.3 million people have fled Syria, and another 6.6 million people have been displaced internally due to the war.

Understanding the reasons behind this, and possible links between water and migration, is imperative if one should be able to put in place policies that address the causes of the refugee situation. In this article, as well as the other contributions in this section, some of the linkages between water and migration are analyzed with the aim of providing a more coherent, and hopefully clearer, picture.

considered in the context of water, climate, energy, and food debates. These four areas have all become more politically important for countries in the Middle East. They are also interlinked, either directly or indirectly, with the broader world. Migratory flows, be they refugee movement or labour migration, affect Europe, Asia and beyond. The global impact of instability in the region is clearly being felt, not least in the second half of 2015 when migration from the region to Europe increased substantially. However, the number of refugees entering neighbouring countries - Turkey, Jordan and Lebanon - were far higher.

In a context where increasing emphasis is placed on linkages between different issue areas and avoiding silo approaches, it is relevant to see how migration can be

## Water shortages resulting in displacement and misery inside Syria

By Noosheen Mogadam and Thomas Whitworth, Norwegian Refugee Council

A number of academics and analysts consider water scarcity a major catalyst for the Syrian crisis. Research papers examining Syria's economy, including Chatham House's publication in June 2015, as well as REACH's September 2015 thematic report, find that a prolonged drought lasting for more than five years resulted in a significant reduction in agricultural production, unemployment and migration. An estimated 1.5 million individuals moved from rural to urban areas in search of employment opportunities, including to the centres of the initial uprising in March 2011.

As the Syrian war enters its sixth year, water security continues to deteriorate for many civilians. While the consequences of the drought are still endured, evidence shows that control over power and water infrastructure is used as a weapon of warring parties, contrary to international law. For example, in August 2015, deliberate water cuts affected up to two million people in Aleppo. Damascus has also been affected. The Wadi Barada provides a significant amount of water to Damascus City but supply networks that pass through opposition-held enclaves have been periodically closed. It was not until January 2016 that an agreement was reached between local leaders and the government to inter alia allow water flows in exchange for the delivery of humanitarian aid. Such agreements must be respected, though access to such resources are basic human rights, not to be bargained over for political or strategic gain.

Whilst conflict and protection concerns are the primary drivers for the current displacement trends, a lack of access to essential services such as water is cited as a major reason amongst both Syrian refugees and internally displaced people within Syria for fleeing their communities. This displacement places yet another burden on the often already stretched capacity of host community services.

A combination of damaged infrastructure, a lack of maintenance, manipulation and limited power-supply has resulted in a 50 per cent reduction in access to safe water relative to pre-crisis levels. According to the 2016 Humanitarian Needs Overview, this has forced an estimated 69 per cent of people inside Syria to rely on unregulated and often expensive sources of water for drinking, domestic use and personal hygiene.

NRC's interviews with beneficiaries further confirm that safe access to water is a key priority. The lack of water is directly responsible for reduced dignity for both displaced and host populations many desperate and willing to make significant life decisions based on the availability of supply. In some areas of Syria daily struggles are faced related to water, triggering protection concerns. Increased rates of waterborne and skin diseases are documented with lack of adequate medical services. In desperate situations, family members, including children, must go to water standpipes and other water collection points sometimes traversing

long distances and waiting in queues to bring water containers back to their homes, often at risk of attack from warring parties. Women and children needing to use latrines which are sometimes communal facilities are left vulnerable to attack and abuse, especially after dark.

Attempts have been made to address the many challenges faced by civilians in Syria in exercising their right to water through both responsible emergency humanitarian assistance and longer-term programming. These interventions include water trucking, the provision of household-level water treatment and storage assistance, repairing water-supply systems and working with authorities to improve the provision of safe water. NRC simultaneously advocates for better tracking of damages to water infrastructure across the country, information to civilians about the location of safe water sources and collective reporting of water consumption patterns through humanitarian coordination mechanisms.

The December 2015 UN Security Council Resolution calling for a nationwide ceasefire in Syria, if respected, may mean that water facilities and infrastructure inside Syria can be rebuilt and protected. Wider issues, however, need also be addressed, such as better water management systems, and respect for international conventions related to water sharing by countries neighbouring Syria.

## Impact of Syrian refugees on Lebanon's water resources

By Nadim Farajalla, Issam Fares Institute for Public Policy and International Affairs

The World Bank estimated the Lebanese population in 2012 at 4.4 million, an increase of 25% from 3.5 million in 1992 (World Bank, 2012). Until 2012, the country had been experiencing a decline in its population growth rate from 4.84% in 2003 to 0.96% in 2011 and 2012 (World Bank 2013). This is illustrated in the table.

Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Population growth (annual %)	4.84	4.33	3.40	2.30	1.46	1.11	1.44	2.19	0.96	0.96

Lebanon has a large number of Palestinian refugees with about 425,000 registered with UNRWA (AUB/UNRWA, 2010). In 2011, the war in Syria erupted and a stream of refugees started flowing into Lebanon. The total number of Syrian refugees registered with the UNHCR reached 1.84 million, (UNHCR 2016), distributed throughout the country, (see Figure 1), which roughly represents a 30% increase in the resident population of Lebanon. This influx of people has had a severely negative impact on the environment in Lebanon, with increasing demand on water, higher generation of sewage that goes untreated and an increase in solid waste that is often disposed of in dumps. All of this has put water resources in Lebanon under severe pressure – high demand coupled with increasing pollution. Currently, Lebanon's renewable water resources are estimated at around 926 m<sup>3</sup>/capita/year (MOEW 2010). However, with an influx of the equivalent of more than a third of the country's population, this number is expected to have dropped to

below 700m<sup>3</sup>/capita/year. The increase in demand for water across the country ranges from as low as 0.1 million cubic metres per year, (MCM/yr), in some regions of the north and south Mount Lebanon, to a high of 7.42 MCM/yr in the Bekaa region (MOE/EU/UNDP, 2014). Water for this increased demand came mostly from the public water supply, with nearly 30% of refugees using this source. Wells were the second source for 24% of refugees (MOE/EU/UNDP, 2014). This increased demand resulted in an associated increase in sewage generation. The generated sewage is disposed of – untreated – into surface and subsurface water sources, common practice in most areas of Lebanon due to the lack of wastewater treatment facilities. The contamination resulting from this pollution renders more water sources unusable thereby depriving more people of an increasingly scarce resource.

The international community has been trying to relieve this situation of growing demand and worsening pollution by helping improve the water sector infrastruc-

ture in several communities throughout Lebanon that are hosting Syrian refugees. The thrust of these efforts has been to improve water distribution networks and build wastewater treatment plants. This human tragedy is worsening, threatening the lives and livelihoods of refugees and their host communities through a resource that is supposed to be the source of life.

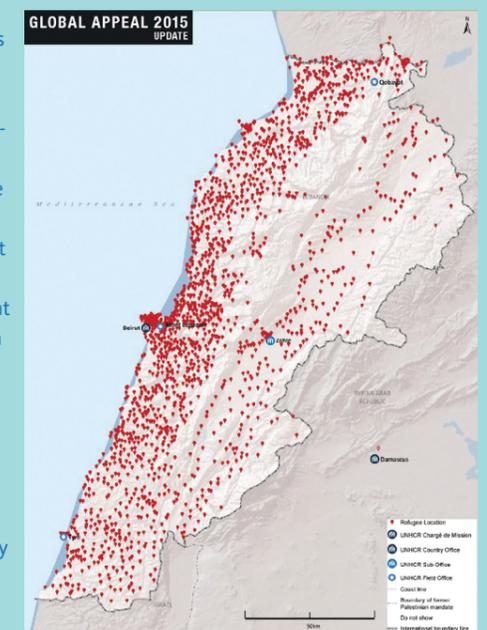


Figure 1. Distribution of Syrian Refugees in Lebanon (source: UNHCR 2016)

Source: World Bank

The securitization of water is likely to remain a key issue given increasing water scarcity driven by population growth and a growing refugee population, the high level of dependence on transboundary water, and a volatile political situation in the region. According to most projections, the added challenge of climatic variations, as well as climate change, will lead to higher temperatures – and therefore greater evaporation – and less rainfall, thereby further exacerbating water scarcity. While securitization of water or climate is understandable, especially in a region such as the Middle East, it runs the risk of encouraging inappropriate government responses. As noted by White, (2011), the relationship between migration and climate in Africa (sub-Saharan, trans-Saharan or trans-Saharan) is weak. He also notes that migration is usually confined to local or sub-regional patterns. Outsiders have been keen to invoke the “threat” of what they call climate refugees, enabling them to further strengthen border controls. White also notes that securitization of environmental challenges enables the security sector to be the main actor in formulating debate and policy. This leads to a focus on defending borders, enabling deeper security co-operation and co-ordination, while policies to address environmental challenges, which are exaggeratedly deemed to be causing migration, receive little attention. White holds that “Getting tough’ – responding in a militarized fashion – is an easy, cynical step in a warming world... Building a fence is easier than changing lifestyles. Yet the injection of security imperatives into climate-induced migration is unethical and unworkable.” Not only does securitization play into the consideration and adoption of inadequate policy measures, it may also serve to “explain” the failure of governments to address underlying challenges relating to, for example, water governance in Syria. De Chatel, (2014), Sowers et al., (2013), and Weinthal et al., (2015), have all noted

that it was the Syrian regime’s failure to establish proper water governance and irrigation systems in the south of the country that led to unpreparedness when drought hit harder than usual. While drought led to major internal migration, the reasons were not the drought itself, but were rather “part of a broader pattern of rural neglect” (Weinthal et al., 2015, p 1).

Large-scale trans-border migration has several dimensions that tend to cause tension between recipient and sender states, regardless of the underlying causes, (Swain & Jägerskog, 2016). In some cases, granting migrants permission to enter its own territory, may strain the relationship between the recipient and sender states. This may be caused by recipient states’ inability to provide basic services to its own citizens. Another possibility is that having settled in a host country, migrants may act against the government of their original country. In some cases, migrants may be encouraged, or manipulated, by host states to react due to existing political differences between the host and the sender states, (Swain 2015), almost certainly resulting in further negative implications for regional water resource development.

Maddocks, Otto and Luo highlight the intricate linkages between water and food insecurity, and how disturbances in this balance can lead to migration. Mogadam and Whitworth highlight the situation in and around war-torn Syria, the constant struggle to maintain, improve and upgrade water systems in Syria and neighbouring countries. Farajalla highlights the pressure on water systems that has been brought about in Lebanon due to the refugee crisis. De Chatel provides an analysis of how mismanagement and the lack of adequate water governance, rather than drought, led to the internal migration inside Syria in the years preceding the civil war.



Photo: iStock

## Water scarcity as a long-term driver of rural-urban migration in Syria

By Francesca de Châtel, Revolve Water

Fifty years of resource mismanagement and growing water scarcity were key drivers of rural-to-urban migration in Syria from the 1980s onwards. The failure of large-scale agricultural development projects, combined with drought and economic reforms in the 2000s, further undermined farmers’ livelihoods and dislocated rural communities. As rivers disappeared and wells ran dry after years of over-exploitation, farmers abandoned their land and sought work in the big cities. Adnan, who grew up in a village on the banks of the Khabur River in north-eastern Syria, left for Beirut in 2002 after the Khabur ran dry. “After they built the Bassel Dam in 1999, water levels quickly decreased. We started using drip irrigation, but soon there was no water left at all. Before, we irrigated most of our land with water from the river; some of it was rain-fed. But when the rains failed, we couldn’t sustain the rain-fed land either. And then they raised the price of diesel. After that, there was no point in working in farming anymore.”

The area around the Khabur River is semi-arid steppe land that was traditionally used for seasonal grazing of sheep and camels and rain-fed agriculture. However, the area’s fragile ecological balance was disrupted by the steady intensification of agriculture from the 1950s onwards, with the introduction of irrigated wheat and cotton and intensive grazing. Groundwater depletion, the drying of springs and rivers – the Khabur Basin had a

water deficit of 3.1 billion m<sup>3</sup> in 2003 – soil salinization and wind erosion meant that by 2008 the region that was once considered the breadbasket of Syria was “in danger of agricultural collapse” (Hole, 2009). As poverty levels rose, villages were gradually abandoned.

While the Khabur Basin is one of the starker examples of the environmental and social impacts of long-term water mismanagement in Syria, farmers in many other parts of the country faced similar situations of water scarcity from the early 1990s. With little or no support from the government, farmers were faced with growing poverty and many were forced to migrate to the cities in search of work. The north-east of the country, the most neglected and impoverished region, was worst affected and while poverty levels were declining in other parts of Syria in the late 1990s and early 2000s, people in the north-east were growing poorer and more food insecure.

The plight of farmers worsened with the liberalization of the economy after 2005: the government increasingly focused on banking, tourism and real-estate, and turned away from agriculture. When state subsidies on diesel fuel and fertilizer were cancelled in 2008 and 2009 at the height of a severe drought in the country’s north-east, the already dire situation in this part of the country further deteriorated. The United Nations estimated that 300,000 people left the drought-stricken north-east



Photo: iStock

between 2008 and 2010. The migrants ended up in slums and makeshift tent camps on the outskirts of Damascus, Aleppo and other cities, barely surviving on low-paid work in factories, on construction sites or as seasonal agricultural workers. In 2009, many like Adnan felt their future had been taken from them. “I wish we could go back home and tend to our herds like before. But there is no water. That has changed everything. I’m desperate. I’m 32 years old. I’ve been working for 10 years. And for what? I live in a slum, I earn low wages, I eat bad food and I’m not even married. What happens after this? Another 10 years of this?”

**Concluding thoughts** | While it could be argued that wider discussion of migration and environmental challenges, and the linkages between them, is positive, it is also of the utmost importance to critically analyze these linkages. Establishing overly simplistic and causal linkages between water scarcity, climate change and variability and migration is not helpful, and may also lead to flawed policy responses. As has been noted above, there has been a tendency to jump to conclusions about causalities between water scarcity, climate change and migration. However, this is rarely the case. Instead, water should be

seen as one of many areas that can contribute to migration, together with a range of other issues. Ultimately, it represents one of many challenges that can be addressed in a systematic manner.

The interlinkages between water challenges and climate change manifested in the form of, for example, increased variability and uncertainty, are not the main causes of large-scale population migration. Rather, they should be considered as push factor multipliers. Social, economic, and political factors will also affect the vulnerability

or resilience of communities. In regions, the ability to cope with climate change and water scarcity decreases, and the likelihood of migration increases, as a result of factors that include poverty, low levels of education, lack of skills, weak institutions, limited infrastructure, lack of technology and information, limited access to health care, poor access to resources, and the over-exploitation of resources, etc. Pull factors, such as a hope of a better life and employment, often combine to result in migration. Thus, blind "securitized" responses to water scarcity also tend to lead to poor conclusions and policies being

put in place. While it is tempting to make causal linkages in the context of a sober analysis, taking an inclusive approach of potential factors that lead to migration should be employed for improved policy development.

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