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# Environment, Security, and Peacebuilding in the West Asia Region



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## Introduction

The majority of West Asian countries are characterized by extreme arid climates, sparse natural vegetation, and fragile soil conditions. The region comprises mainly desert lands with the exception of coastal strips on the fringes and some mountain ranges and has access to very scarce water resources and arable lands.

Whilst much attention is paid to the region's political economy, far less is paid to the climate change and environmental issues surrounding it. Environmental concerns in the region are often disassociated with what is perceived as the more urgent state politics, economics and even sports, and only come into full view through the lens of a climate crisis, foreign investment opportunity, and/or public protest.

For example, although some scholars express caution about securitizing climate change, the uprising in Syria is often attributed to earlier years of crop failure as a result of climate change and low precipitation. There are of course other factors that have contributed to the unrest in Syria including socio-economic discord and political mismanagement but environmental and climate factors must also be considered.

The conflict in Yemen can also be viewed through a climate change and natural resource lens, namely the persistent water and food crises that have contributed to state failure prior to the most recent Yemen uprising. The environment then, broadly conceived with issues ranging from water, food, air, and waste management, as well as the uneven distribution of wealth derived from natural resources, has to be considered to be a large part of the drivers towards the uprisings and social inequality that is still prevalent across the region.

The Food and Agriculture Organization of the UN says that effective environmental management in the Arab World, where there are many common denominators, is key to future growth and stability. Islam, the religion of the majority of the region, places special emphasis on the protection of natural resources and environmental stewardship. As such, one would expect climate change and the degradation of the environment to be a driver for change and yet, it is one of the last areas of concern in many of the countries in the Middle East. This contradiction begs the question, why would a region whose religion is very much embedded in its policy and laws fail to adequately address and prioritize one of the most fundamental elements of its doctrine?

It is argued that climate change impacts and environmental degradation in the West Asia region are abnormal across all aspects, including water and waste management, although some progress has been made in places such as the UAE, Saudi Arabia, and Oman. These environmental problems act as a latent issue that can fuel unrest and conflict across the region. Climate change contributes to a host of socio-economic issues but is also a function of them. Without a holistic strategy, often states fall short of prescriptive measures to alleviate human suffering associated with climate change impacts and environmental problems, if that is in fact part of the overall brief for authoritarian regimes, which is highly disputable.

Violent conflicts have also had a major impact on the environment, including water resources, contamination of rivers, releases of oil, access issues, and use of contaminating materials by the military (such as depleted uranium from ammunition). A stark example of this was at the end of the first Gulf War when Iraqi troops set fire to over 700 oil wells south of the Iraqi



border, releasing 1.5 billion barrels of oil into the environment resulting in the largest oil spill in human history. Claims were made against Iraq in response to the oil spillage by a number of state actors, but the difficulty of quantifying the degradation to groundwater, long term consequences to the environment, and uncertainties about refugee human health meant many were unsuccessful.

During the U.S. military campaign in Iraq, the U.S. military used the equivalent of 1.2 million cars worth of oil in 2008 alone, illustrating how climate concerns often take a backseat to broader political agendas. Cases of ill health from increased levels of dust and toxins have also been reported in Iraq.

ISIS would repeat Saddam Hussein's technique of setting fire to entire oil fields during their retreat from Mosul in 2016.

During war and in cases of state fragility and collapse, it is extremely difficult to maintain the necessary infrastructure to protect the environment. In fact, environmental concerns may run entirely contrary to socio-economic and political concerns. In some instances, there has also been a politicization and even securitization of climate change and environmental challenges. This is very clear especially when it comes to water resources whether surface or underground aquifers.

In short, environmental issues, climate change and natural resources in West Asia can be a source of fueling tensions but can also fall prey to the endless conflicts in the region. It can also be an entry point for joint cooperation and sustainable development and peacebuilding, as climate and natural resources are not particularly sensitive political issues.

This paper discusses the environment and natural resources throughout West Asia as both a source of

regional conflict, as well as a casualty of it. First, a very brief outline of the natural resource status and environmental challenges in the West Asia region will be presented, including reference to Syria, Iraq, Lebanon, and Yemen. The paper will then go on to explore the link between climate change, environment, and civil unrest/conflicts across the region in more detail. Finally, concluding remarks and recommendations are made related to the environment/climate change and conflicts in the region.

## Environmental Status in the West Asia Region

The entire West Asian region is facing numerous environmental challenges. Some are traditional, linked to water scarcity, land degradation and desertification, and a lack of capacity linked to resource allocation and mismanagement. The region is in fact the most water scarce region in the world.

Others are emerging environmental challenges such as climate change, increased demand for energy, construction and demolition debris, and hazardous war remnants.

Water pollution is another problem due to contaminants from the oil industry, war remnants, untreated sewage, and salinization. Water resource depletion and quality deterioration have resulted in unsustainable water consumption pattern and created undeclared state tensions over shared water sources, both surface and underground. Another environmental problem related to water is the marine and coastal pollution from oil spills and the shipping trade, land-based sources of pollution, as well as negative impacts from global climate change.

Political changes aimed at improving environmental governance and social equality could lead to a virtuous cycle of year-on-year

efficiencies and improvements, building national resilience to further resource shocks or shortages, and new social processes and norms that favor environmental conservation and protection.

The sub region of the GCC countries represents a unique case of development, where oil and gas revenues have enabled an exceptionally accelerated development process in all aspects of life. These countries have become a hub of intense geopolitical, military, economic, industrial, construction, tourism, and other anthropogenic activities. There is no doubt that the transformation of the region has been primarily driven by hydrocarbons. The economies of the GCC countries are supported primarily by the oil and gas sectors, which contribute between 25 percent and 56 percent of their GDP. However, recently, the GCC countries have undertaken a number of pioneer steps towards the green energy transition and circular economy through their vision statements. Yet, the scale of oil and gas productions has nonetheless led to severe environmental problems.

The main concern continues to relate to oil spills and other discharges on land and offshore from large tankers, oil refineries, distribution stations, and the petrochemicals industry, with consequent impacts on natural resources including biodiversity loss and air pollution. As a result, it appears that as economies grow, traffic, waste, greenhouse gas emissions, and ecosystem destruction also increases. The fact is that the management and use of natural resources as well as chemical, hazardous wastes, and greenhouse gas (GHG) emissions, have not kept pace with economic development in the region, especially in the GCC countries.

## Climate Change and Conflicts

At the same time, there is growing recognition of the interrelationship between climate change and conflict. This can be a result of climate change causing direct competition over scarce resources as well as mistrust between groups/villages/

authorities etc. In addition, climate change can contribute to or intensify natural disasters, such as floods, heat waves, dust storms, or droughts, which can have socio-economic impacts and weaken governance, especially in fragile states that lack capabilities for managing these vulnerabilities.

According to economists, a rise in the local temperature of even half a degree Celsius is associated with a ten to twenty percent increase in the risk of deadly conflict.

Whereas recent research indicates that climate change does not directly cause conflict, it acts as a “threat multiplier” that exacerbates existing conflicts and tensions by disrupting livelihoods, provoking food insecurity, water scarcity, resource competition and spurring migration.

The relationship between climate and conflict is neither simple nor linear. Climate-driven conflict is not always a straightforward scramble for diminishing resources, be they water, food, or arable land. Climate change impacts can create situations that disturb peace and cause tensions within and between countries such as unstable food prices and competition over scarce natural resources such as water, pastures and fisheries. This can contribute to more conflict and fragility, in particular when interacting with other existing conflict drivers such as inequality, marginalization and unfair distribution of natural resources.

The same climate impacts can produce very different conflict outcomes depending on the political response. In some instances, rising temperatures and uneven rainfall generate scarcity; in others, climate change—and human responses to it—unlocks new resources. While some countries manage climate-induced competition well, others do not manage it at all—making unrest/instability and conflict more likely.

The relationship between climate and conflict can also be inverted: conflict can worsen climate change and impede mitigation efforts. Some



scholars have referred to a society’s adaptive capacity to assess its ability to address climate change-related stressors. A society’s adaptive capacity is “their ability to adjust to change, reduce risks and protect the population.”

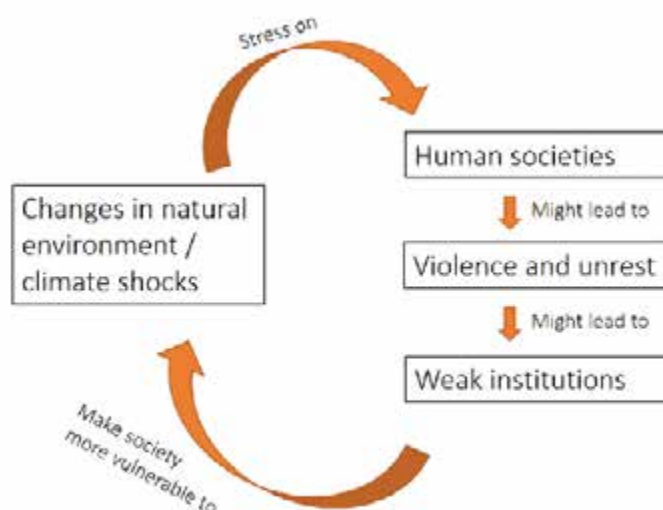
It results from having the right institutions, knowledge, technology, infrastructure, resources, and a level of equity in society. However, even societies with high adaptive capacities can fail at addressing climate-related stress, if the right supportive policies and governance are not in place.

Climate change creates additional demand for state services as well as adds new tasks for official armed forces in any country. For instance, when local firefighters and volunteers were unable to extinguish the 2021 Algerian wildfires, armed forces were called in. Still, the government resources were inadequate in putting out the nearly 70 fires that roared through the northeast of the country. This lack of preparedness resulted in many deaths, loss of homes and livestock, and resulted in fierce criticism over the government’s inability to provide basic protection measures against common natural disasters.

When these urgent needs are unmet, they can compound pre-existing grievances over inequality,

political marginalization, and unresponsive governments. Particularly in fragile states, the convergence of conflict and climate change can create new forms of social vulnerability. Because climate change acts on many fronts and one event can trigger a cascade of responses, many indirect and hard to predict consequences of climate change may occur.

Moreover, the relationship between changing climates and armed conflict is complex. It does not always take the same form, but the research is clear that changes in the natural environment impose stress on human societies. Similarly, violence and unrest weaken institutions, impeding adaptation and resilience-building, making society more vulnerable to climate shock. When men are forced to go off to fight in armed conflict, they leave their wives and children behind, increasing the socio-economic toll on women. Women are likely to suffer disproportionately from climate change, with increased maternal mortality associated to heat-stress, and gender-based violence in the aftermath of natural disasters or conflicts. If, as is common today, men in rural areas move to cities to seek paid employment when they lose their traditional livelihoods, rural women would be under pressure to take over their husbands’ responsibilities on top



Source: Arab League Research and Policy Studies Center (ARPC) et al. 2017. Arab League Climate Assessment Report. Available from:

of their own daily activities.<sup>1</sup> This cycle suggests that political and socioeconomic factors will continue to be the primary sources of internal strife and that climate change will serve as a risk multiplier. This is especially true in countries that are already low or declining in peacefulness.<sup>2</sup>

Overall, this means that countries with high levels of positive peace are better able to manage climate-induced shocks and tend to have higher environmental performance than those with lower levels of positive peace.<sup>3</sup>

## Climate Change in the West Asia Region

Among the top countries most exposed to the impacts of climate change, all West Asian countries are included. What's more, Iraq, Syria, Jordan, Lebanon, Yemen, and the GCC countries rank among those "extremely" vulnerable to negative impacts of climate change.

Climate change affects almost all sectors of the economy such as water, agriculture, energy, and tourism and could therefore be catastrophic to humanitarian and economic development efforts. In the UN's 2014 report of the Intergovernmental Panel on Climate Change, it was agreed that climate change can "indirectly increase risks of violent conflicts in the form of civil war and inter-group violence by amplifying well-documented drivers of these conflicts such as poverty and

economic shocks."<sup>4</sup> In 2007, the ex-UN Secretary General Ban Ki-moon described the conflict in Sudan's Darfur region as the world's first climate change conflict. The assumption was that water scarcity from changed rainfall patterns resulting from climate change had contributed to this conflict. His thinking reflects findings to date that the incidence of conflict is likely to be higher in years of lower precipitation, especially in arid or desert areas.

The environment continues to be the silent casualty of the civil unrest and from the various endless conflicts in West Asia. In the region, people are not only dying from bombs, missiles, and bullets but also from preventable diseases, maladies, and complications arising from environmental pollution, including air pollution which cost an estimated 125,000 lives in the Middle East in 2013 and costing an estimated \$9 billion.<sup>5</sup> The economic losses associated with air pollution are greater than the GDPs of Lebanon, Syria, Tunisia, and Yemen combined.<sup>6</sup>

In the West Asia region, temperatures are already increasing (1.1°C) and will continue to do so in the foreseeable future. Predictions lay between 2.7°C and 5°C by the end of this century compared to the reference period (1985–2005).

1 In the Republic of Yemen and in Sudan, daily activities for women and children include the necessity of traveling increasing distances to fetch potable water. This additional labor has already forced girls in rural areas to drop out of schools (UNDP 2018).

2 Global Peace Index (GPI), <https://reliefweb.int/sites/reliefweb.int/files/resources/GPI-2019-web003.pdf>, 49

3 <https://reliefweb.int/sites/reliefweb.int/files/resources/GPI-2019-web003.pdf>, 42

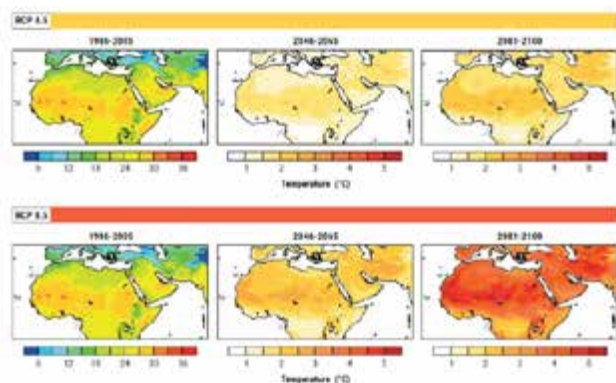
4 IPCC, 'Assessing and Managing the Risks of Climate Change', [https://www.ipcc.ch/site/assets/uploads/2018/03/WGIIAR5\\_SPM\\_Top\\_Level\\_Findings-1.pdf](https://www.ipcc.ch/site/assets/uploads/2018/03/WGIIAR5_SPM_Top_Level_Findings-1.pdf)

5 The World Bank, "Air Pollution Deaths Cost Economies in Middle East and North Africa More than \$9 Billion," September 8, 2016, <https://www.worldbank.org/en/news/press-release/2016/09/08/air-pollution-deaths-cost-economies-in-middle-east-and-north-africa-more-than-9-billion>

6 Mahmoud Abouelnaga, "Poor Air Quality and Lost Economic Opportunities," *Atlantic Council*, July 18, 2019, <https://www.atlantic-council.org/blogs/menasource/poor-air-quality-and-lost-economic-opportunities/>



This means that temperatures in this region are rising more than the global average. Overall, the highest increases in average mean temperature in the region are projected in the non-coastal areas, including the Tigris and Euphrates headwaters, and the central and western parts of the Arabian Peninsula. Precipitation trends are likely to continue decreasing across the region until the end of the century, although some limited areas are expected to exhibit an increase in the intensity and volume of precipitation (such as in Oman).<sup>7</sup> Scientists believe that the increase of temperature will lead to a number of transboundary effects in the region such as desertification (especially of the Empty Quarter desert), deforestation, projected sea-level rise, and decline of freshwater sources.<sup>8</sup>



**Figure 2: Predicted rise in temperature in the MENA region**

Source: United Nations Economic and Social Commission for Western Asia (ESCWA) et al. 2017.

7 United Nations Economic and Social Commission for Western Asia (ESCWA) et al. 2017. Arab Climate Change Assessment Report – Executive Summary. Beirut, E/ESCWA/SDPD/2017/RICCAR/Summary.

8 [https://eda.ac.ae/docs/default-source/Publications/eda-insight\\_gear-iii\\_water\\_en.pdf?sfvrsn=2](https://eda.ac.ae/docs/default-source/Publications/eda-insight_gear-iii_water_en.pdf?sfvrsn=2)

One third of the countries analyzed in the Global Peace Index (GPI) are at a high risk of extreme climate hazards as well as low levels of peacefulness, making them most at risk for conflicts spurred or exacerbated by a changing climate. Of these countries, 18% percent are in the Middle East. Figure 2.34 shows the ten countries with the lowest levels of peacefulness and corresponding risk to an extreme climate hazard. In Syria, for instance, drought is of primary concern, while Oman and Yemen face high risk of tsunamis. Iraq is at highest risk of severe flooding.<sup>9</sup>

Damage to energy, water and food production and delivery infrastructure in conflict-affected countries exacerbates a critical situation for health and the economy in the coming years.<sup>10</sup> Urban devastation has been recorded in areas of aerial bombardment and/or ground level fighting in Iraq, Yemen, and Gaza over the last decade. Each country is suffering an acute shelter crisis, deteriorating municipal and public services including waste and sanitation, and dangerous levels of water and energy insecurity. This damage amplifies societies' vulnerability with respect to climate change, increasing exposure to temperature extremes, water scarcity, disease, and food insecurity. Infrastructure to enable clean water and sanitation including water treatment plants, pumping stations, water towers, and sewage treatment plants, often become targets in the fighting.

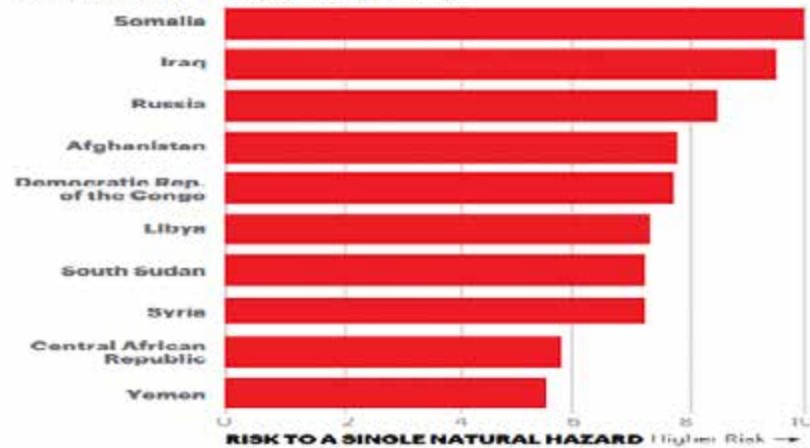
In Yemen and Syria, conflict has dramatically reduced clean water access and proper forms of waste disposal in urban and rural areas and led to various outbreaks of hepatitis A, typhoid,

9 Global Peace Index 2019: <https://reliefweb.int/sites/reliefweb.int/files/resources/GPI-2019-web003.pdf>, 47-48. In 2019, the GPI for the first time factored climate change into its analysis, and the results were significant. The GPI determined that climate change already has a notably negative impact on peace and security.

10 ICRC, 2015.

FIGURE 2.34  
**10 least peaceful countries and corresponding risk of climate hazards, 2018**

Somalia, the sixth least peaceful country, has the highest risk of drought of all recorded countries.



SOURCE: INFORM Global Risk Index 2019; IEP calculations

leishmaniasis, and cholera<sup>11</sup>, Israel’s 2021 attacks on Gaza compounded food security in the country with direct destruction or damage to crops, animal sheds, greenhouses, citrus orchards, and storage facilities as well as damage to irrigation channels and pumping equipment. Gaza already suffers from toxic metal pollution in soil caused by previous bombing attacks<sup>12</sup>.

## Climate Migration

Displacement linked to climate change is not a future hypothetical – it’s a current reality. An annual average of 21.5 million people have been

11 Al-Zarier, Bahira, Mohammed Al-Haj Ali and Justin Clark (2017), “Suwayda Residents, Citing Weak Government Authority, Turn Anew to Tribal Laws to Resolve Civil, Criminal Matters”, in Syria Direct <https://syriadirect.org/news/in-the-absence-of-government-authority-residents-of-suwayda-turn-to-tribal-laws-leaders> (accessed, September 27, 2020).

12 EL-Nahhal, Y., EL-Najjar Sh., Afifi, S. (2015), “Toxicity of Carbaryl, Chlorpyrifos and Diuron to Different Aquatic Organisms,” *Toxicology International* 22:45-53. <http://dx.doi.org/10.4103/0971-6580.172256>

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**Climate Migrants are a major challenge within and between countries of the West Asia region.** ”

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forcibly displaced by weather-related sudden onset hazards such as floods, storms, wildfires, and extreme temperatures each year since 2008.<sup>13</sup>

Climate change affects people inside their own countries, and typically creates internal displacement before it reaches a level where it pushes people across borders. It is therefore preferable to refer to “persons displaced in the context of climate change” according to UNHCR.

Climate Migrants are a major challenge within and between countries of the West Asia region. Migration from the region into Europe has

13 UNHCR, <https://www.unhcr.org/news/latest/2016/11/581f52dc4/frequently-asked-questions-climate-change-disaster-displacement.html>.





increased significantly with the onset of the Syria crisis in 2011, with Europe now hosting about one third of all people migrating from West Asian countries including some 4.9 million Syrian refugees<sup>14</sup>.

Also, climate change migrants, internal displacement, and refugee flows resulting from armed conflict and insecurity have caused sudden and unexpected increases in population in some provinces and countries. In Syria, Iraq, and Yemen conflict has brought about the internal displacement of people to areas poorly equipped to provide for them. Lebanon, Jordan, and the Kurdistan region of Iraq host large numbers of refugees which, even with immense international assistance efforts, has put pressure on services, housing, and natural resources. There is no doubt that we need to place refugees and IDPs at the heart of interventions that link peace-security-climate-development interventions.

Many countries also face growing pressure from climate-related migration, spurred by collapsing agricultural sectors and increasingly harsh living conditions. Displacements are likely to become more commonplace as tensions mount over sharing increasingly scarce natural resources, heightened risk of drought, desertification, and changes in land and water availability due to climate change. Particularly vulnerable are indigenous and pastoral communities, whose land and territorial rights are often not recognized. In the low-lying coastal regions, rising sea levels are also expected to lead to displacements as storm surges causing saltwater intrusion into rivers and aquifers degrades agricultural land and land is reclaimed by the sea. Coastal erosion threaten

industrial and touristic infrastructure located near the coast.

Rural livelihoods are likely to be undermined as climate change shifts rainfall patterns and decreases agricultural productivity, spurring migration to cities. The move to the outskirts of major cities contributes to greater urbanization. Farmers and pastoralists are leaving their livelihoods for temporary, insecure, and ill-paid jobs, thereby increasing already high unemployment rates.

Urban centers are expanding rapidly due to accelerating population growth and migrant influx. With cities, there is a growing lack of infrastructure to serve an increase in population. Climate-induced stresses such as famine are also forcing many rural populations to find natural resources in neighboring regions or countries. Conflicts have disrupted national and cross-border trade flows that otherwise support livelihoods and food security. These challenges related to climate change are compounded by instability in the region.

Cross-border migration can put newcomers in competition with locals for limited economic opportunities and government support, leading to sociopolitical strain, xenophobia, and the scapegoating of refugees—all of which are recipes for deadly violence.

It is worth mentioning that within the sub-region of the GCC countries, climate migrants are not deemed to be an issue of concern. However, it can be stated that there are economic migrants who come to work in GCC countries (from countries within the West Asian region and beyond), many of whom came to GCC looking for jobs because climate change negatively affected their economic opportunities back home.

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14 International Organization for Migration, “Migration to, from and in the Middle East and North Africa,” available at [https://www.iom.int/sites/g/files/tmzbd1486/files/country/mena/Migration-in-the-Middle-East-and-North-Africa\\_Data%20Sheet\\_August2016.pdf](https://www.iom.int/sites/g/files/tmzbd1486/files/country/mena/Migration-in-the-Middle-East-and-North-Africa_Data%20Sheet_August2016.pdf) (accessed, April 24, 2023).

## Country Cases: Climate Change, Conflict, and Peacebuilding

### Syria

Syria's economy largely depends on industry and oil production. Water resources are limited and unevenly distributed. Thus, water shortages are common due to heavy use for irrigation agriculture (about 88% of all freshwater). In spite of availability of water from several basins including the Yarmouk and Orontes, Syria has an annual water deficit currently estimated at about 3 billion cubic meters (about 20% of all water needs). In addition to water scarcity, Syria faces several economic constraints including declining oil production, population growth, rising budget deficits, and high unemployment.

Increased environmental stress due to excessive water use and pollution, deforestation, overgrazing, and soil erosion are likely to negatively impact the country's agricultural production, and the effects of climate change will only exacerbate these issues.<sup>15</sup> All in all, Syria is at risk of several natural hazards, including floods, droughts, extreme temperatures, landslides, and storms.<sup>16</sup>

In Northeast Syria, a severe drought, exacerbated by poor water management policies, lasted from 2006 to 2011. Among families dependent on agriculture, 75 percent suffered crop failures, and herders lost nearly 85 percent of livestock. Syria's 2011 uprising had many causes—first and foremost the government's brutal repression of the initial protests. But the drought must surely be counted among them, as popular unrest and violent clashes began in cities already strained by food insecurity and the influx of hundreds of thousands of rural Syrians displaced by the drought (mostly from agricultural and farmer

communities in northeastern Syria).<sup>17</sup> ISIS would later on exploit the dire economic situation as well as needs for access to water to recruit fighters in some parts of the country.<sup>18</sup>

The existing political and security issues in Syria are compounded by decreasing annual precipitation. Many areas are continuing to become drier, damaging agriculture, affecting urbanization and development. The Barada River, which provides water to villages near the capital city of Damascus, has almost dried up over recent years due to low levels of rainfall in Syria. Herds of livestock have died and the prices of many crops more than doubled. Moreover, the food subsidies on which many depended were cut. As a result, farmers or in other words "the environmental or water refugees" have been left with widespread deterioration of agricultural harvests, leading to food insecurity and contributing to the country's instability. Such instability is also a result of urban problems related to energy, water, sanitation, and waste management. Worsening environmental conditions coupled with incoming refugees from Iraq after the US-led invasion in 2003 as well as the bombing of the Shi'a shrine in Samarra in 2006 led to an uptick in sectarian violence that fueled conditions of unemployment and poverty in Syria.

The consequences of conflict in Syria are similar to those in Lebanon during the 2006 conflict with Israel, albeit on a greater scale. Coalition and Russian forces have targeted oil installations and storage sites, and bombarded populated areas and industrial facilities, especially in

15 <https://climateknowledgeportal.world-bank.org/country/syria>

16 <https://climateknowledgeportal.world-bank.org/country/syria/vulnerability>

17 <https://www.foreignaffairs.com/articles/ethiopia/2020-09-28/climate-change-doesnt-have-stoke-conflict>

18 <https://dc.cod.edu/cgi/viewcontent.cgi?article=1637&context=essai>



Aleppo.<sup>19</sup> Timely identification of health risks in a war zone is difficult but should be prioritized as soon as possible and form an important part of the reconstruction effort. More than half the residential areas have been destroyed, there are millions of tons of rubble to dispose of. The reconstruction effort is expected to cost \$1.2 trillion.<sup>20</sup> The likely platforms to connect these efforts include the World Humanitarian Summit and the UN Environmental Assembly.

According to Marwa Daoudy, assistant professor at the Center for Contemporary Arab Studies at Georgetown University’s School of Foreign Service, the origins of the human insecurity experienced by these populations lies not solely in the environmental hazard, the drought, but in the types of policies that were chosen, which were in fact motivated by ideological choices. In this case, choices were made to liberalize the agricultural sector and to focus on the urban centers; to liberalize all of the sectors that were providing safety nets to the agricultural populations in terms of subsidies on food and fuel at a time of a very severe drought. This is one element of several layers of human insecurity over the decades preceding the uprising which also find their roots in political discontent, political repression, economic insecurity rooted in corruption, and different policy choices which disregard the needs of the most vulnerable populations in Syria.

Another local example inside Syria is the area of Hasakah, in northeast Syria, which is one of the poorest regions in Syria and has depended on agriculture and food production to sustain its livelihood. When government subsidies were abruptly halted, poverty and displacement

increased drastically, as entire families were no longer able to sustain themselves. Without government willingness to address their needs, people were forced to migrate to other areas of the country where they had relatives or seek other options for survival. The result was widespread discontent, drawn on environmental issues, and triggered by a volatile political economy and the political mismanagement of the drought. This is one of the different elements that precipitated major mobilization and uprisings, which were based on global human insecurity in Syria, where the drought was just one of the elements. Syrian officials did not take into account what was happening in the remote areas of the country, which ended up impacting the urban-rural divide, contributing to the root causes of the uprisings.<sup>21</sup>

## Iraq

In Iraq, environmental concerns stem from population growth, the impact of three wars, climate change, poor land use planning, and encroachment on fragile ecosystems.<sup>22</sup> In terms of climate change, between 1970 and 2004, the country’s mean temperature increased by 1-2°C.<sup>23</sup> Expectations are that Iraq will suffer from more intense heat waves with adverse effects on agriculture, water resources, human health, and infrastructure. Water resources are challenged by a combination of poor water management, conflict, lack of local policies, unstable relations with regional neighbors, and climate change.

Iraq lies in a water stressed region, with few water resources of its own. Its water security depends on efficient management of water resources and systems and, importantly, on effective water

19 Conflict and Environment Observatory, ‘Five Years on: Lessons Learned from the Environmental Legacy of Syria’s War’, March 16, 2016, <https://ceobs.org/five-years-on-lessons-learned-from-the-environmental-legacy-of-syrias-war/>.

20 Ibid.

21 <https://www.csis.org/analysis/climate-security-nexus-marwa-daoudy>

22 Roz Price, ‘Environmental Risks in Iraq’, Institute of Development Studies, June 8, 2018, [https://assets.publishing.service.gov.uk/media/5b3b63a3e5274a6ff466faa5/Environmental\\_risks\\_in\\_Iraq.pdf](https://assets.publishing.service.gov.uk/media/5b3b63a3e5274a6ff466faa5/Environmental_risks_in_Iraq.pdf)

23 Ibid.

diplomacy with the country's neighbors and with Iraqi Kurdistan.<sup>24</sup> Over the last decades, the construction of dams and infrastructure upstream has substantially reduced the quantity and quality of water flowing into Iraq, at a time when the country had a weak capacity to negotiate water sharing with its neighbors. Various dams upstream in Turkey, Iran, and Syria on the Tigris and Euphrates Rivers cause escalating levels of salinity in the Shatt Al Arab River which threatens local livelihoods. Projections for water imports forecast further major declines by 2025. The Kurds maintain control over the Tigris water flow upstream from Baghdad and therefore a national plan which includes negotiation and cooperation with the Kurdish Regional Government (KRG) is required.

Iraq's water stress – and broader environmental problems such as weapon contamination, hazardous waste, air pollution, and ecosystem destruction – has been fed by the direct and indirect consequences of repeated conflicts that have severely damaged the environment, destroyed infrastructure, and eroded the resilience of communities and institutions. After the Iran-Iraq War in the 1980s, the Gulf War in 1990, and the U.S.-led intervention in 2003, followed by internal sectarian conflict and an insurgency led by ISIS, Iraq is experiencing a legacy of war which makes the environmental issues more complex. Ongoing conflict has undermined the government's ability to manage contaminated sites, risks from oil fires and ammunition dumps, and a vast quantity of waste. Water installations were already in a poor state before ISIS expansion, and therefore their reinstatement and upgrading to ensure they cannot be weaponized or affected in the future would help ensure water security in



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Iraq.<sup>25</sup> If the marshes can be rescued in the south, Basra port modernized to boost economic growth, and better cooperation be achieved with regional neighbors on water management, it would help turn the situation around in Iraq. In 2018, Basra experienced a water crisis whereby 6,200 people needed hospital treatment for intestinal infections after the Tigris and Euphrates Rivers fell to dangerously low levels and the basin water sources

24 Iraq's water supplies largely depend on the Tigris and Euphrates Rivers, which originate in Turkey, and to a lesser extent in Iran, and on water flowing south from Iraqi Kurdistan.

25 Tobias von Lossow, "More than Infrastructures: Water Challenges in Iraq," Clingendael Policy Brief, July 2018, [https://www.clingendael.org/sites/default/files/2018-07/PB\\_PSI\\_water\\_challenges\\_Iraq.pdf](https://www.clingendael.org/sites/default/files/2018-07/PB_PSI_water_challenges_Iraq.pdf)



became increasingly saline.<sup>26</sup> Desalination efforts have been stepped up, but it is unknown whether these efforts will be sufficient in addressing the challenge.

Precipitation is on a slightly downward trend, while temperatures and the risk of heatwaves and droughts are on the rise. The average annual rainfall is expected to be well below the 300 millimeters required to maintain rain-fed crop growth in the long term. Despite reduced water flows, few measures have been taken to adapt water usage and consumption, leading to an over-exploitation of limited groundwater. As agriculture<sup>27</sup> continues to use the largest share of the country's water, pressure on water resources and urban systems keeps increasing, thanks to population growth and urbanization. Access to clean water in Iraq is not only uneven and sometimes insufficient, water is also of poor quality, with high levels of salt in some areas and contamination from sewage and agriculture.

By increasing the fragility of institutions at all levels, armed conflict has limited Iraq's capacity

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26 Mohammed Al-Khuzai, "Iraq: Red Crescent Responds to Water Crisis in Basra", International Federation of Red Cross and Red Crescent Societies," September 10, 2018, <https://relief-web.int/report/iraq/iraq-red-crescent-responds-water-crisis-basra>

27 Beyond having dramatic and direct health impacts, water scarcity and environmental problems have pushed agricultural productivity down, and along with macroeconomic and political factors, have resulted in food and economic insecurity for large numbers of Iraqis. Agriculture contributes to about 5 per cent of the country's GDP but is the source of livelihood for a fifth of the population, mostly through a mix of rain-fed and irrigated crop production. Attempts to develop alternative irrigation systems such as drip irrigation or artificial water canals have been inadequate and unsustainable, in part because the authorities have neglected agriculture for decades. Over time, agricultural land has shrunk. Livelihood options for farmers are limited, as there are few jobs available for people without specialized skills and networks. For many, the only way to cope has been to move temporarily or permanently.

to ensure the sustainable management of water resources and systems, and to guard against environmental degradation and climate risks at the local, national, and regional levels. The deep, visible, and lasting damage to the environment reflects not only the severity of the degradation, but also the inability of institutions to protect the environment and ensure its restoration. Biodiversity loss has followed from unregulated hunting, lack of protection of important sites, and trade in endangered species. Institutional challenges to planning and coordinating adequate responses are many, ranging from insecurity, weak institutions, aging infrastructure, and a mindset that encourages consumption rather than environmental preservation. The country's economic reliance on oil exploitation<sup>28</sup> also makes it hard for the society to grasp and embrace the profound implications of a shift towards renewable energies at a national and global level. Obstacles to a comprehensive response to climate and environmental risks include limited technical expertise, insufficient knowledge of climate risks and their consequences at the local level, lack of authoritative data on water quantity and quality, lack of capacity, or unwillingness, to implement existing laws, and inadequate investment in the water sector. Prolonged instability has also impaired Iraq's capacity to engage in regional water cooperation and diplomacy with Iran and Turkey, and with Kurdish authorities.<sup>29</sup>

Subsuming, Iraq is exposed to the three major threats of terrorism, corruption, and climate change. Amid this complex risk landscape, the report of the Expert Working Group on Climate-Related Security Risks has identified five priority climate-related security risks in Iraq:

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28 Iraq's economy is dominated by the oil sector, which contributes about 60% to national gross domestic product.

29 [https://www.icrc.org/sites/default/files/topic/file\\_plus\\_list/rain\\_turns\\_to\\_dust\\_climate\\_change\\_conflict.pdf](https://www.icrc.org/sites/default/files/topic/file_plus_list/rain_turns_to_dust_climate_change_conflict.pdf), 29ff.

### 1) Diminished agricultural livelihoods increase local support for terrorist groups

As efforts to diversify Iraq's dependency on oil revenues have not resulted in any significant investment in sustainable agricultural livelihoods, livelihood conditions are being undermined by increasing water scarcity, leaving people in ISIS-liberated areas vulnerable to becoming dependent on terrorist groups for access to basic resources. ISIS could capitalize on this situation, leading to a risk of increased local support for ISIS and other terrorist groups.

### 2) Insufficient governance capacity to address and respond to climate change and environmental degradation

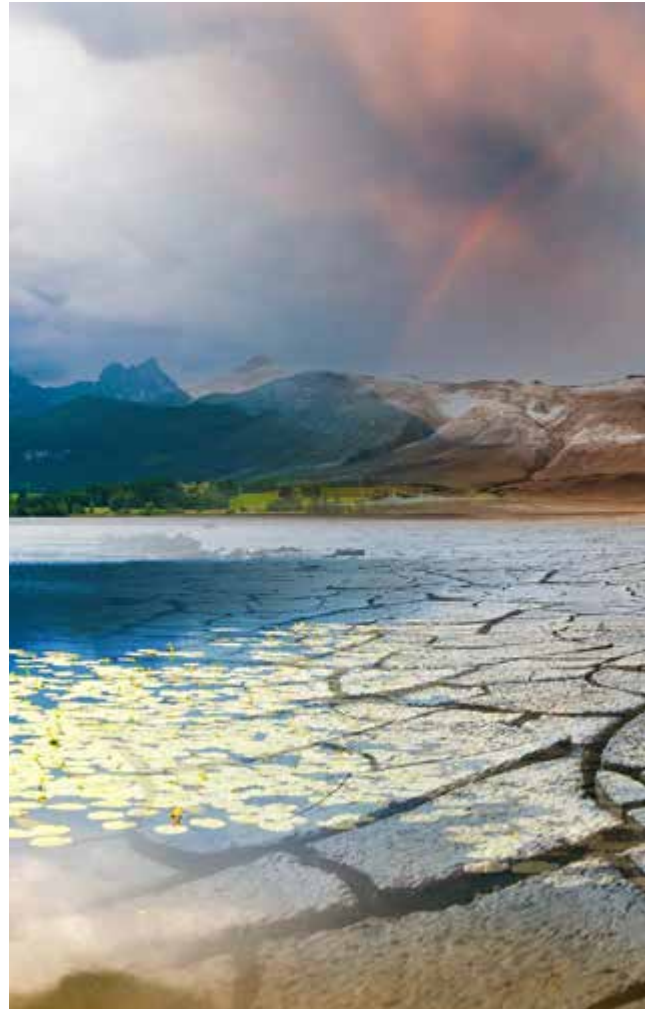
Corruption, poor governance, wars, UN sanctions, and the heritage of the Saddam Hussein regime have weakened Iraq's economy and the state's capacity to mitigate the impacts of climate change and modernize the water infrastructure and the agriculture sector. The Ministry of Water Resources has an ambitious 20-year plan (2015–35) to modernize Iraqi infrastructure, but the ministry lacks the financial means and capacity to implement it. Consequences such as violent conflict and displacement are becoming increasingly likely but have not been integrated into post-ISIS recovery plans.

### 3) Increased dependence on water flows from riparian neighbors and regional stability

Since Iraq is a downstream recipient of water, as explained above, the country is dependent on water flows from neighboring countries. If neighboring countries are destabilized—by reduced rainfall or conflict—Iraq will be further exposed. To date there are no official agreements or frameworks in place to support equitable sharing of vital water resources in the region.

### 4) Mass displacement and forced migration

The combination of increased rainfall variability



and dam projects in neighboring countries could increase the risk of displacement and forced migration along Iraq's populous rivers. Seven million people live along the banks of the Tigris River. In combination with erratic rainfall, if water is diverted by Turkey, people in downstream Iraq will not have access to water for drinking or agriculture. This would increase the risk of displacement. The downstream Kurdistan region faces similar risks if water is diverted by Iran. The livelihoods of hundreds of thousands of people would be affected, potentially causing displacement and forced urban migration.

### 5) Heightened communal tensions over access to food and water

Iraq faces the risk of prolonged periods of drought, which could increase the risk of communal



tensions over food and water. Diminishing incomes and food and water insecurity, put pressure on remaining scarce resources, risking increased tensions within and between communities. This is particularly the case in rural and marginalized communities where sufficient adaptive and mitigation policies have not been put in place. For example, in southern Iraq diminishing water resources have already led to demonstrations and local clashes over water rights.<sup>30</sup>

In places south of Basra, where the population has traditionally relied on growing dates and henna, people attribute their water and farming problems to the cutting of emblematic date palms for military purposes during the Iran-Iraq war. For this reason, some farmers turned to fishing when salty soil became unfarmable, contributing to an overexploitation of fish resources. These events had immediate consequences for inhabitants' lives and the environment, and these consequences continue to be felt through all the bouts of conflict that have come and gone since then. They also tore apart the social fabric, wore down national cohesion, and aggravated the resentment and distrust of the population towards the state.

In southern Iraq, annual rainfall has long been below 300 millimeters. The decrease in precipitation is coupled with a decline in the water discharge of the Euphrates-Tigris, as explained above. In addition, the drying up of marshland in the early 1990s has contributed to sea intrusion, causing increased salinization and making parts of the land unfarmable. Iraq's food basket, in the central south of the country, has lost about 50% of its production capacity due to salinization over the last two decades.<sup>31</sup> This has resulted in an overall

reduction in vegetation cover and an increase in the frequency and intensity of dust storms. These conditions could turn the entire Fertile Crescent region into an infertile area by the end of the century. Iraq is already experiencing frequent droughts that have had severe socio-economic and health consequences.

## Jordan

In South Jordan,<sup>32</sup> the security service constitutes an important employer for men (almost 70% of those in full time employment in rural stretches of the southern governorates are in the army, civil defense, or intelligence corps) and constitutes a crucial actor for maintaining infrastructure (they run schools, maintain roads, water infrastructure, bridges and so on). Most of the other residents are dependent on soldiers' spending. Especially in the recent years, security services have monopolized the rural economy.

The main factor for this lies in the slow collapse of herding and settled agriculture, the cornerstones of village livelihood. The state has upped recruitment, fearing unrest among these all-important segments of society. Neglected reforms bring the government's finances to a point in which drops in recruitment become likely as well as future cuts to the most bloated parts of the public sector. At the same time, conditions for crop cultivation and animal grazing are only worsening as severe water scarcity bites, and more workers are finding their professions untenable. Having seen so many of their peers find jobs in the security services, they expect similar treatment. That calculus is only getting more desperate as many thousands of young people come of age in a countryside unable to employ them. Reduced rainfall, reduced surface water, and prolific population growth, particularly since the arrival of over a million Syrians since 2011, have brought the country to the brink of disaster.

30 Expert Working Group on Climate-related Security Risks: Iraq: Climate-related security risk assessment, 2018, <https://www.eastwest.ngo/sites/default/files/iraq-climate-related-security-risk-assessment.pdfq-report-cover.pdf>

31 von Lossow, Tobias (2019) "More than infrastructures: water challenges in Iraq," Clingendael

32 Though particularly pronounced in the south, this is true, too, of some densely populated swathes of the tribal north, especially around Salt and Ajloun.

At a little over 100m<sup>3</sup> per person per year, Jordan's water availability is ten times lower than the globally accepted mark of water scarcity. That is a major problem for an agricultural sector which is competing against more generously subsidized farmers from other countries who grow crop staples on much larger plots of land. The outer districts of Amman are jammed with recently arrived rural migrants. Water and electricity bills continue to increase, too. Because Jordan's population has surged, just as resources like surface water and rainfall have decreased, state water delivery is failing more often, which has compelled many households to fall back on water tankers. This is a particularly expensive problem in the countryside because water delivery is erratic there and tanker operators pass on the higher fuel costs required to drive longer distances. Tanker operators are widely believed to conspire among themselves to keep prices high for water (often of bad quality). Villagers across the south accuse water officials of deliberately cutting municipal water delivery so as to keep residents more dependent than ever on tanker operators with which the civil servants themselves have connections. In the short term, at least, security service jobs have served as something of a brake on the fallout from these slow-moving disasters. But as the public sector has swollen beyond viability, no one has yet come up with an alternative solution to a crisis that will only worsen as climate stresses continue to bite.

Already, water-related unrest is beginning to proliferate in the countryside. Some communities in the north have ripped out their water meters in protest at limited, poor-quality water, and for sometimes being charged for water they never receive. Others are refusing to pay their bills. Among the many grievances of the protesters who have congregated near the Ministry of Interior in Amman on a regular basis in 2019 are high water and electricity costs. In heavy displays of force, the state has taken to blocking off roads and corralling protesters in small spaces.

In the villages themselves, the collapse of

traditional employment is inflicting a heavy toll. Residents complain of increases in drug use and petty crime. Social cohesion is erring in places, as some of the better-established and more affluent families migrate to the cities, leaving just the poor and prospect-less behind. There's every possibility, too, that scarcer water might emerge as a bone of contention between different communities. Though most Jordanians are understanding of Syrian refugees' plight and have welcomed them, their hospitality is beginning to wane. Local men warn of violence in northern communities where populations have as much as tripled due to the refugee influx and where water shares per capita have shrunk as a consequence.

Most dangerous of all, more and more desert communities are threatening to take on the state if their demands are not met. Around tourist-heavy Petra, Bedouins are so furious at their lack of job opportunities that they are threatening to return to the caves in which they previously lived in the ancient site, a move that would most likely spark a security response. In late August 2019, a resident of Om Saihoun, one of the most impoverished villages around Petra, opened fire on an empty tour bus.

In Ma'an, a small city just off the main north-south highway with a history of jihadist activity,<sup>33</sup> residents anticipate further trouble if job opportunities continue to fall at a time of higher prices. In August 2019, a nearby stretch of the Disi pipeline, which supplies over half of Amman's water, was sabotaged – yet again, shutting off much of the capital's water flow for several days.<sup>34</sup>

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33 Ma'an activists estimate that 120 residents fought in Syria and perhaps 700 against the U.S. army in Iraq.

34 "How Jordan's Climate and Water Crisis Threatens its Fragile Peace," The Center for Climate & Security, available at <https://climateandsecurity.org/2019/09/climate-water-security-and-jordans-fragile-peace/>





## Yemen

Yemen is one of the most ancient cradles of civilization in the Middle East. Yemen used to be, and still is, called in Arabic literature “the happy or fortunate Yemen.” Sadly, there is no sign of happiness for this country in the near future in light of the ongoing conflict. In general, Yemen might be the poorest country in the Middle East, but it has great strategic importance for its neighbors. The country sits on the Bab al-Mandab Strait, a waterway linking the Red Sea with the Gulf of Aden, through which much of the world’s oil shipments and goods trade passes.

Yemen is largely dependent on its agricultural sector, including production of khat, or *qat*, fruit and vegetables, which supports 75 percent of the rural-based population.<sup>35</sup> Yet, it remains vulnerable to climate change impacts such as drought, flooding, pests, sudden disease outbreaks, severe storms and rising sea levels. Yemen is among the most water-stressed countries in the world, brought on by regional drought, a naturally dry climate, and failed attempts at water management. Some estimates say that Yemen will run out of fresh water by 2023.<sup>36</sup> There are very limited natural freshwater resources and inadequate supplies of potable water. Yemen has experienced long periods of water shortages due to the rapid growth of the market economy, government support for development, and groundwater extraction. The water quality is very poor due to a degraded water supply infrastructure. Poor central planning, wastage, and policies that encourage heavy water use – from cheap diesel pricing to funding surface or spate irrigation for water-heavy cash crops such as *qat* are to blame for the current shortage.

Since the start of deep well drilling in the 1970s, Yemen’s groundwater resources have diminished

35 UNDP, ‘Yemen’, <https://www.adaptation-undp.org/explore/western-asia/yemen>

36 Austin Bodetti, ‘Yemen is Running out of Water’, *Lobelog*, March 20, 2019, <https://lobelog.com/yemen-is-running-out-of-water/>

at a rapid pace – fostered by state subsidies and the absence of effective regulation. Consequently, competition for the precious resource has intensified and led to numerous, highly localized conflicts. Conflicts over water are carried out on various levels. Sometimes, only between a few individuals, e.g., when a villager builds a well more proximate to another villager’s home than customarily accepted. Often, however, the violence over water involves whole tribes or villages fighting each other, by inflicting considerable damage to the competitors’ water infrastructure, e.g., through the blowing up of wells and pumps, or also by directly killing members of the other community. Occasionally, clashes also involve governmental soldiers. According to researchers from Sana’a University, 70-80% of conflicts in 2012 in rural Yemen were related to water.

Community water sources were overburdened and dysfunctional before the war and have been affected by conflict-related damage and further strain due to the influx of Internally Displaced Persons (IDPs). By 2022, there were about 4.3 million IDPs<sup>37</sup>. In the context of a rising population, severe unemployment, political instability, active terrorist organizations (ISIS and Al-Qaeda), external interests, and dwindling water and food resources, the impact of climate change will be much worse. Urban infrastructure has been destroyed, including water and desalination facilities and only 45 percent of the healthcare facilities are operational.<sup>38</sup> Plans for development

37 Internal Displacement Monitoring center, The truce in Yemen: opportunities and challenges for IDPs, July 2022, <https://www.internal-displacement.org/expert-opinion/the-truce-in-yemen-opportunities-and-challenges-for-idps> (accessed on April 17, 2023).

38 Margaret Suter, ‘An Update on Yemen’s Water Crisis and the Weaponization of Water’, Atlantic Council, November 29, 2018, <https://www.atlanticcouncil.org/blogs/menasource/an-update-on-yemen-s-water-crisis-and-the-weaponization-of-water/>

have had to be put on hold whilst the fighting continues. In 2015, 13 million Yemenis lacked reliable access to drinking water and conditions have worsened as water supplies dry up and prices increase beyond what most people can afford.<sup>39</sup> Local water shortages have coincided with several other critical political, economic and demographic factors to precipitate a full-scale civil war from 2015 and the mobilization again of a southern succession movement. Damage to water and sanitation infrastructure and disruption to the public health system have contributed to many cholera outbreaks. From October 2016 to September 2017 cholera affected nearly 800,000 Yemenis.<sup>40</sup>

Agricultural lands continue to be threatened by droughts, desertification, and wind and water scarcity. Food security and economic income has been lost, affecting many Yemenis. These issues continue to affect the shape of the conflict in Yemen, which along with lost infrastructure, will take many years to rebuild. Yemen, like Syria and Iraq, shows how different threats can combine to form an apparently insurmountable developmental challenge. The best prospect for Yemen is to learn a lesson from Syria, that ending the conflict will give the country a better chance of addressing the environmental and economic challenges it faces. If parties to the conflict wait for 10 years, it may be too late to revitalize the failing state. Water will need to take its rightful place as a policy priority in whatever government(s) form after the conflict ends.

## Water, Conflict, and Peacebuilding

As described above, the lack of water is a defining challenge in the West Asian region. A complex interplay between rapid population growth, excessive economic activities, and unsustainable

water and food subsidies are the main reasons for water scarcity in the region. Extreme climate conditions such as increased heat and evaporation, as well as more frequent drought cycles, present additional stresses on water resources.

The region's annual internal renewable water resources amount to only 6 percent of its average annual precipitation, against a world average of 38 percent. During the period 2005 to 2015, annual per capita freshwater availability in the region dropped by about 20 percent. Increasing temperatures and evaporation rates associated with climate change will only further accentuate the problem.

With growing populations and increasing per capita water use, water demand in the region is projected to increase by 60 percent by 2045, while climate change is expected to reduce water runoff by 10 percent by 2050. Impacts will vary across the region. The most vulnerable countries have been said to be those that depend on rainfall or rivers. Nonetheless, the Arabian Peninsula, which lacks freshwater resources and thus depends heavily on desalination, will also be impacted by increasing salinity levels associated with climate change.

Groundwater exploitation mainly used for agriculture has caused a deterioration of water quality, most notably salinization. Beside the aforementioned impacts, water scarce regions will have fewer resources to support their industries as well as their populations. Poor populations that are heavily dependent on natural resources for their survival will likely be most hard hit.<sup>41</sup>

From a conflict perspective, the climate impact on water resources in the region is - and will continue

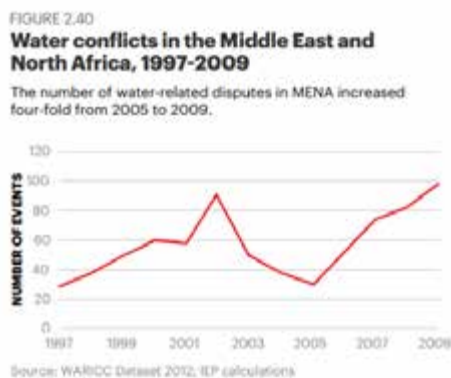
<sup>39</sup> Ibid.

<sup>40</sup> Conflict and Environment Observatory, "Country Brief: Yemen," March 26, 2018, <https://ceobs.org/country-brief-yemen/>

<sup>41</sup> UNDP, *Climate Change Adaptation in the Arab States. Best practices and lessons learned*, 2018, <https://www.undp.org/content/undp/en/home/librarypage/climate-and-disaster-resilience/climate-change-adaptation-in-the-arab-states.html>, 26.



to be - one of the most challenging effects. Figure 2.40 shows the rise in water-related conflicts in MENA. In this region, growing populations, poor water management, and increased use of shared water resources have exacerbated environmental vulnerability as increased water scarcity leads to higher vulnerability in agricultural systems, reduced crop productivity, and growing food and livelihood security.



Tensions over scarce water resources resulted in increasing numbers of water-related disputes in 32 countries across Europe, MENA and sub-Saharan Africa, the three regions covered by the Water-Related Intrastate Conflict and Cooperation (WARICC) dataset. Across the three regions, the total number of water disputes tripled from 1997 to 2009. While the majority of these disputes were resolved without violence, instances of water-related conflict rose over 400 per cent from 1997 to 2009, with net increases in the Middle East and North Africa and sub-Saharan Africa outweighing declining numbers in Europe.<sup>42</sup> Regions lacking international agreements over water resources are particularly at risk.

On average, around 66% of freshwater resources in the region originate from outside national borders in the MENA region, and there is a growing concern that climate change may further act as a catalyst aggravating water scarcity and tensions within and

between the nations sharing hydrological resources, and geographical or political boundaries.<sup>43</sup> Since resource depletion can lead to domestic conflict and instability, regional competition over scarce common resources like water becomes a question of protecting internal political stability and is therefore often addressed as a matter of national security.

Similarly, effective transboundary water management is becoming more challenging because precious and unpredictable flows from rivers and wadis traverse country boundaries. Also, water usage and data are not coordinated from upstream to downstream. Currently, countries have limited experience in sharing data other than through the support of external regional initiatives such as the Intergovernmental Authority on Development. In terms of cooperation in shared river basins, almost all are currently managed unilaterally by the riparian countries. The existing few agreements are bilateral rather than basin wide, and in many cases riparian countries are intensifying water development and withdrawal efforts, which is increasing competition and tensions over shared water resources. In addition, the anticipated negative impacts of climate change on the availability of water resources are expected to exacerbate the situation.

Climate change and poor land-water management practices are negatively impacting the key economic sectors in the region. According to the World Food Program MENA region, the region has the highest food-deficit in the world and is the highest food-importing region globally. More than 50 million people are considered undernourished, and 21.2 million people are food insecure, especially in Palestine, Somalia, Sudan, Syria and Yemen. The value of the agricultural contribution to the GDP has declined in most Arab countries in the last two decades. The decrease was most dramatic in Jordan, Sudan, the Syria, Tunisia, and Yemen.

42 <https://reliefweb.int/sites/reliefweb.int/files/resources/GPI-2019-web003.pdf>, p. 49ff.

43 [https://eda.ac.ae/docs/default-source/Publications/eda-insight\\_gear-iii\\_water\\_en.pdf?sfvrsn=2](https://eda.ac.ae/docs/default-source/Publications/eda-insight_gear-iii_water_en.pdf?sfvrsn=2)

After the food crisis stemming from the Russia-Ukraine war, many MENA countries put agriculture and food security on top of their national policy agenda. Climate change is expected to impact the region's agriculture and food production systems, with potentially severe impacts on food security, most notably in countries that depend on rainfed systems.

Most of the agricultural area in the Arab countries is rainfed, and a large portion of the region's agricultural production is based on dryland farming systems. Crop yields are expected to drop by 30 percent with a 1.5 to 2.5°C increase in temperature and by 60 percent with a 3 to 4 °C increase, with geographical variation and without considering adaptation. Yet, there has been little investment in maximizing the contribution of the region's scarce water towards increasing agricultural productivity, such as through water efficient irrigation methods and purchase of seeds for drought-resistant crops. Agriculture absorbs more than 85 percent of the region's water. Intensive agriculture in some cases has accelerated groundwater depletion, especially in the Arabian Peninsula, and has increased agropollution and soil salinity.<sup>44</sup>

Bluntly put, the water shortage is the most important environmental issue for the region, and it is time to start treating water resources as a principle of common and shared responsibility, not of common ownership. Confidence-building measures, such as data and technology exchange, and the development of a common methodology should be supported as well to enhance water cooperation among the region's countries. In addition, there is a need to plan for a joint response to climate risk in a collaborative manner.

The following section provides examples of trans-

border and national conflicts which are in some ways linked to climate change and environmental shocks, i.e., trans-border conflicts triggered or exacerbated by climate change:

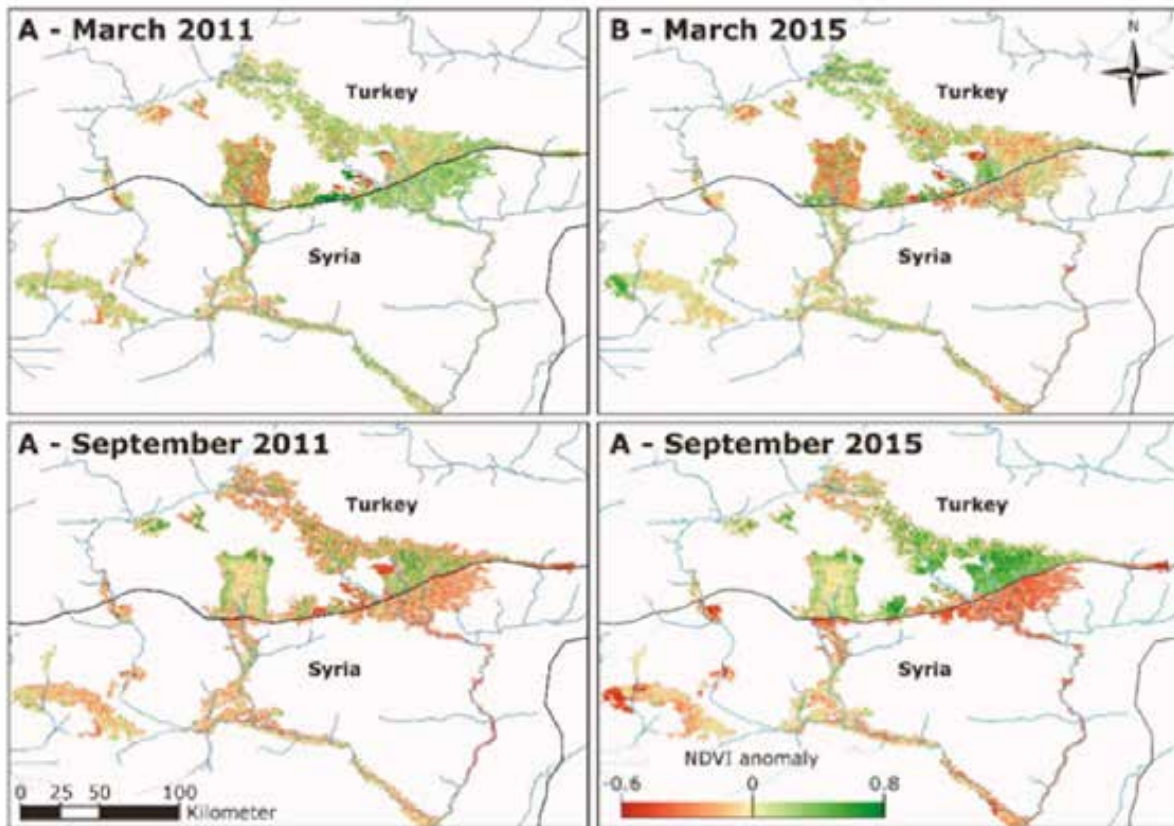
## Turkey – Syria – Iraq

Rapid and uncoordinated development in the riparian states of Turkey, Syria, and Iraq has changed the Euphrates River's flow regime, causing a 40–45 percent reduction in downstream water flow since the early 1970s. In the past 50 years, some 32 dams and barrages have been built on the river. Their construction – along with growth in water-intensive agriculture, pesticide use and industry – has wreaked havoc on downstream water quality and ecology. The prediction of the UN, according to which the flow of the Euphrates and the Tigris could decrease by 30% and 60% respectively by the end of the century, shows that the quantity of water flowing through Syria and Iraq is likely to become even scarcer.

In the past 50 years, the co-riparian states unilaterally initiated large-scale water development projects in an uncoordinated way, thereby affecting the river flow. As population growth in the region led to higher water demands, the initial purpose of these projects was to regulate the flow of the river and prevent flooding. However, it rapidly became a plan for hydropower generation to enable Turkey to limit its dependency on oil for energy. In addition to that, environmental factors aggravated the tensions between the co-riparians. For instance, in 1975 Turkey and Syria simultaneously started to use the Keban (Turkey) and Taqba (Syria) dams during a period of drought. This dispute, solved thanks to the mediation of Saudi Arabia, almost led to an armed conflict.<sup>45</sup>

44 UNDP: Climate Change Adaption in the Arab States. Best practices and lessons learned. 2018. <https://www.undp.org/content/undp/en/home/librarypage/climate-and-disaster-resilience-/climate-change-adaptation-in-the-arab-states.html>, p. 25-27

45 <https://library.ecc-platform.org/conflicts/turkey-syria-and-iraq-conflict-over-euphrates-tigris#:~:text=the%20Euphrates%2DTigris-,The%20Euphrates%2DTigris%20Basin%20is%20shared%20between%20Turkey%2C%20Syria%20and,strained%20relations%20in%20the%20basin.>



Turkey, an upstream state, can instrumentalize water to pressure states located downstream, as they did in 1987 when Turkey and Syria brokered an agreement, in which Turkey committed to release 500 m<sup>3</sup> water per second to Syria whilst the latter committed to put an end to its support to the PKK.<sup>46</sup> In general, Turkey was accused of withholding water to Kurdish areas in Syria. The figure below shows the impacts on vegetation growth on both sides of the border.<sup>47</sup>

Until today, there is no multilateral agreement that would regulate the water sharing. However, the Euphrates-Tigris Initiative for Cooperation tries to foster a common understanding through data sharing and joint planning.

## Yarmouk River Basin

The Yarmouk River is a tributary to the Jordan River and therefore forms part of the Jordan system, which comprises Israel, Syria, Jordan, and Lebanon. The Yarmouk has its source in Syria, flows to Jordan and Israel and joins the Jordan River downstream to the Sea of Galilee. In the early 1950s, following the 1948 Arab - Israeli War, all co-riparians to the Jordan system started unilateral water-development plans. As these unilateral projects caused skirmishes amongst the countries, the U.S. sent a mediator – Ambassador Eric Johnston – to broker a multilateral agreement on water management (between Syria – Jordan and Jordan – Israel).

While external efforts were made to negotiate an agreement by the Centre for Environmental Studies and Resource Management (CESAR), to date still no multilateral agreement has been signed between the countries of the Jordan system, mainly because Syria has refused to negotiate with Israel. In addition, what little

46 Ibid.

47 <https://syriadirect.org/news/turkish-dams-threaten-northeast-syria-with-ecological-and-economic-blight/>

effort has been made has been compromised. For example, Syria was accused of violating the bilateral agreement of 1953/1987 with Jordan by withholding water to the countries downstream, which led to environmental degradation and water shortage for the population in these countries. If mismanagement and treaty violations continue, analysts also predict a heightened potential for conflict due to increasing water scarcity in the region, especially in Jordan.<sup>48</sup>

## Saudi Arabia – Yemen Desalination

In the face of water scarcity, growing dependence on desalination and treated wastewater in the Arab region is inevitable. Saudi Arabia has huge desalination capacities, which provide fresh water to millions of people. These desalination capacities are critical infrastructure and therefore of high national security concern. The first desalination power plant was located on the east-coast of Saudi Arabia, but with the increasing threat of Iranian missiles reaching the coast, the Saudi government started to build new plants on the west coast. Since the outbreak of the war in Yemen, these plants have been vulnerable to missile attacks from the Houthis, who attempted a rocket attack on a desalination plant in 2019.<sup>49</sup> It is believed that desalination plants are such a critical part of the infrastructure in the Gulf that they are likely to come under greater threat of terror attacks in the future.<sup>50</sup>

48 <https://library.ecc-platform.org/conflicts/yarmouk-river-agreement-between-syria-and-jordan>

49 <https://www.mees.com/2019/6/28/geo-political-risk/houthis-expose-saudi-arabias-growing-desalination-dependency/f9ed1050-99af-11e9-86b8-6bd2eaa2dbd3>

50 <https://www.belfercenter.org/publication/gulf-escalation-threatens-drinking-water>

## Jordan – Saudi Arabia

Jordan and Saudi Arabia share one huge groundwater resource, called the “Disi” aquifer. Throughout the 1990s and early 2000s there has been a cold conflict over the use of the water with both sides accusing the other of over-extracting while trying to secure as much water as possible for its own purpose, thereby using up much of the non-renewable water. In 2015, Jordan started building an aqueduct to transfer water to Amman that largely increased the extraction rate. In this context, both countries finally signed a joint agreement to manage the water resources. The agreement created a Joint Water Committee (JWC) as a permanent institution charged with implementing the agreement and addressing additional water issues that might arise.

## Waste, Conflict, and Peacebuilding

### Lebanon

The Lebanese environment is an end product of the country’s recent conflicts, including contamination of land, air, water, and biota from the most recent conflict which lasted July - August 2006 in which 1,191 people were killed, 900,000 fled their homes, severe damage was caused to infrastructure, and 30,000 housing units were destroyed. In August 2006, the Lebanese Minister of Environment requested that the UN Environment Program conduct a post-conflict environmental assessment of Lebanon. In the subsequent report, the UNEP finds that the bombing of fuel storage tanks at the Jiyeh thermal power plant resulted in 10,000 to 15,000 tons of heavy fuel being spilled into the sea.<sup>51</sup> The conflict exacerbated solid waste issues since there were vast amounts of rubble to dispose of, along with hazardous healthcare waste which

51 UNEP, *Lebanon: Post-Conflict Environmental Assessment*, 10, [http://wedocs.unep.org/bitstream/handle/20.500.11822/16756/Lebanon\\_PostConflict\\_Environmental\\_Assessment.pdf?sequence=1&isAllowed=y](http://wedocs.unep.org/bitstream/handle/20.500.11822/16756/Lebanon_PostConflict_Environmental_Assessment.pdf?sequence=1&isAllowed=y)



was mixed in with normal waste, threatening public health, and thousands of cubic metres of hydrocarbon-contaminated soil requiring treatment. Heavy metals remain in the air around heavily bombed sites. The clearing of unexploded ordinance remains a priority.<sup>52</sup>

Beyond conflict, a waste crisis began in 2015 when residents near the Naameh landfill site forced the government to shut it down, more than a decade after it was scheduled to close. The protest following trash being left in the street from July 2015 to August 2016 led to one of the first mass mobilizations in more than a decade and spurred the government to open a new landfill at Bourj Hammoud on the outskirts of Beirut.<sup>53</sup> Since the 1975-90 wars, Lebanese militia forces have run the dump, accepted toxic waste from Italy, and the government has been unable to implement a functional national waste plan.<sup>54</sup> Instead, a series of quick fixes have been implemented, including expanding upwards rather than outwards. An alternative, such as an incinerator, could also become a health hazard with the added potential for explosions. The infrastructure needs updating, and enforcement requires improvement in order to ensure accountability. The Lebanese case suggests that with the right combination of political will, external support, and ongoing grassroots pressure, an environmental solution might present itself.

The situation in Lebanon is very complex where many environmental, economic, and social factors lead to environmental degradation, economic losses, and social unrest. The failure of adequate solid waste management for instance, is a result of a poor governance system and has led to negative climate change impacts which in turn affect agriculture, water, and many other sectors. The final conclusion is a vicious cycle of climate-insecurity.

52 Ibid, 162-165.

53 Fiona Broom, "Fighting the Big Burn: Lebanon's Waste Dilemma," *New Internationalist*, November 27, 2018, <https://newint.org/features/2018/11/01/lebanon-trash>

54 Ibid.

## Governance Structures

The bright side to all of this is that social engagement on environmental issues has the potential to unite people and to mobilize them in line with the government or local decision makers. Historically, civil society and grassroots organizations have lacked the leverage required to change private sector or state agency behavior. Governments are often said to lack capacity in this area, but evidence suggests otherwise. Some governments incorporate a range of opaque state institutions to fuel domestic uncertainty about state decision making. Regulatory capacities and environmental expertise often do exist but are under-utilized, and a proliferation of donor projects in this area have not performed well.

The last decade witnessed the growth of environmental movements across the West Asia region. Since Qatar hosted the climate talks in 2012, there has been a visible change in the positions of some of the major oil exporters in terms of recognizing the vulnerability of their economic models and seizing opportunities to invest in infrastructure for a more sustainable future. Due also to catastrophic events over the last few years, such as the Jeddah floods in 2009 and the tropical storms that hit the Omani coastline in 2021, governments have begun to develop climate strategies and initiatives.

Since 2015, most countries in the region, excluding Yemen, have ratified the Paris Agreement and submitted Nationally Determined Contributions (NDCs). Oman, KSA and the UAE, perhaps, have the most advanced national climate change strategies, having included detailed measures in their national plans to address the negative impacts of climate change on the environment. Additionally, Saudi Arabia has put forth both Green and Middle East Initiatives in an effort to increase climate action within the region. These initiatives have helped to raise public awareness about the importance of managing climate change

and the message is spreading rapidly throughout the region. The UAE will host the next climate negotiations, COP28, and Saudi Crown Prince and Prime Minister, HRH Mohammed bin Salman, will lead the annual MGI Summits in order to mitigate the impact of climate change on the region. These efforts have helped to countries in the region to collaborate on meeting global targets and simultaneously support economic diversification goals.

Governance is a crucial factor in determining resilience in the face of climate change as well as effectively managing tensions and conflicts especially within the borders of a country. There is a need for public awareness, capability, and cooperation as well as more space for civil society organizations (CSOs) to operate effectively. The private sector needs to be invested in innovation that will support government climate change strategies, and they need to be able to deliver green and resilient solutions to the market. Good governance is key to realizing those.

There is a need to involve all concerned ministries and sectors such as finance, transportation, energy etc., to better tackle climate change issues. This is still missing in many countries across the region, however, there has been a very recent shift in thinking towards a holistic coordination between all governmental bodies in areas of environmental concern. While this shift has taken place in more stable areas like the GCC countries, the absence of good, comprehensive governance in other places, as well as the lack of integrated resource management mechanisms, environmental impacts such as those associated with climate change accelerate tensions. This is very clear in the cases of Yemen and Iraq.

The region must prioritize adaptation over mitigation especially in fragile states. Priority should be given to understanding and addressing the consequences of climate change to prevent

violent conflict. Developing competence on adaptation needs to be treated as part of good governance. Peacebuilding and development strategies should include adaptation to climate change and make explicit how activities on these three interconnected elements strengthen one another.

There is a need to develop guidelines for the private sector to help companies identify how their core commercial operations can support adaptation. Policy makers should look to indigenous and traditional knowledge and systems to resolve conflict associated with climate change related threats and their impacts.

When it comes to environmental governance, there are strong institutional structures in place within GCC countries. Most of the environmental authorities, however, lack the environmental cadres needed to face climate challenges and deal with their impact on conflict and peacebuilding within the region. The following presents the institutional and governance structures in GCC countries:

## **Saudi Arabia**

The Ministry of Energy is one of the governmental bodies of Saudi Arabia and part of the cabinet. The ministry has the function of developing and implementing policies concerning petroleum and related products. Since August 2019, the ministry has been divided into the Ministry of Petroleum & Mineral Resources with Bandar Al-Khorayef as the minister of natural resources and the Ministry of Energy with Abdulaziz bin Salman Al Saud as the energy minister. Furthermore, the Ministry of Environment, Water and Agriculture, with Abdulrahman Al-Fadli as minister, is responsible for the achievement of sustainability of the environment and natural resources in KSA. The Saudi Energy Efficiency Center (SEEC) was established by the Council of Ministers and aims to rationalize and increase energy efficiency in





production and consumption.<sup>55</sup>

Other relevant government bodies include:

- Presidency of Meteorology and Environment (PME), which was renamed General Authority for Meteorology and Environmental Protection (GAMEP) in 2016
- National Wildlife Conservation and Development Authority/Saudi Wildlife Authority

In November 2020, KSA hosted the G20 Summit with ‘Safeguarding our Planet’ and climate mitigation efforts being important agenda points. The Saudi T20<sup>56</sup> focused on the G20 summit and involves a taskforce on climate change and the environment.

The Gulf Research Center<sup>57</sup> addresses, inter alia, issues related to climate change and was involved in the second workshop of the Tafahum working group on “Environmental Issues and Climate Change in West Asia and the Arabian Peninsula,” which took place in September 2020 in cooperation with the Stockholm International Peace Research Institute (SIPRI). Furthermore, the King Faisal Center for Research and Islamic Studies<sup>58</sup> recently completed a publication titled “A New Price Era in a Time of Climate Action: Towards a Resilient and Responsive Saudi Economy.”<sup>59</sup>

Other relevant think tanks and institutions in Saudi Arabia:

- King Abdullah Petroleum Studies and

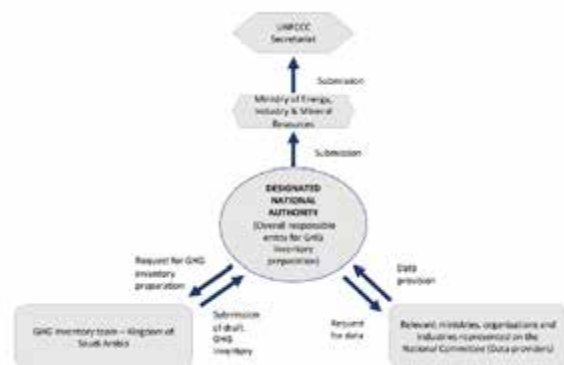
Research Center (KAPSARC)

- King Abdullah University of Science and Technology (KAUST)
- King Abdullah City for Atomic and Renewable Energy (KA-CARE)

Institutions involved in sustainable development:

|                          | State-led reforms  | Semi state-led (hybrid) reforms  |
|--------------------------|--|--|
| Existed before           | <ul style="list-style-type: none"> <li>- Ministry of Petroleum and Mineral Resources (MPMR)</li> <li>- Ministry of Water and Electricity (MOWE)</li> <li>- Electricity and Cogeneration Regulatory Authority (ECRA)</li> <li>- Royal Commission for Jubail and Yanbu</li> <li>- Presidency of Meteorology and Environment (PME)</li> </ul> | <ul style="list-style-type: none"> <li>- Saudi Electricity Company (SEC)</li> <li>- Saudi Aramco</li> <li>- Saline Water Conversion Corporation (SWCC)</li> <li>- National Water Company</li> <li>- King Abdullah City for Science and Technology (KAUST): Energy Research Institute (ERI)</li> <li>- King Fahd University for Petroleum and Minerals (KFUPM)</li> <li>- Saudi Basic Industries Corporation (SABIC)</li> </ul> |
| Created by King Abdullah | <ul style="list-style-type: none"> <li>- King Abdullah City for Atomic and Renewable Energy (KA-CARE)</li> <li>- Saudi Center for Energy Efficiency Center (SCEEC)</li> </ul>  | <ul style="list-style-type: none"> <li>- King Abdullah Petroleum Studies and Research Center (KAPSARC)</li> <li>- King Abdullah University of Science and Technology (KAUST)</li> <li>- Saudi Green Building Forum (SGBF)</li> </ul>   |

Source : <https://climateactiontracker.org/countries/saudi-arabia/>



## UAE

In 2017, the UAE launched a new energy strategy, which aims to diversify the energy sector by developing renewable, coal, and nuclear energy. Moreover, the cabinet adopted the country’s first National Climate Change Plan covering the period of 2017-2050. The plan is overseen by the UAE Council on Climate Change and the Environment.

55 <https://www.seec.gov.sa/en/>

56 Created in 2012, the Think 20 (T20) is an engagement group comprised of think tanks whose primary challenge is to add value to the G20 process with evidence-based public policy proposals.

57 <https://grc.net/index.php>

58 <https://kfcris.com/en>

59 <https://kfcris.com/en/view/post/32>

| UAE Summary of pledges and targets |                              |   |
|------------------------------------|------------------------------|---|
| PARIS AGREEMENT                    | Ratified                     | Yes   |
|                                    | 2030 unconditional target(s) | Various non-quantified measures, 24% of clean energy in 2021<br>[396% above 1990 by 2021 excl. LULUCF (CAT assessment)]<br>[31% above 2010 by 2021 excl. LULUCF (CAT assessment)] |
|                                    | Coverage                     | Individual measures   |
|                                    | LULUCF                       | Not mentioned   |
| COPENHAGEN ACCORD                  | 2020 target(s)               | None  |
| KYOTO PROTOCOL (KP)                | Member of KP CP1 (2008–2012) | No  |
|                                    | Member of KP CP2 (2013–2020) | No  |
| LONG-TERM GOAL(S)                  | Long-term goal(s)            | None  |

The climate change Executive Committee<sup>60</sup> is charged with the responsibility of supervising and coordinating all climate change activities in the UAE. It is chaired by the Ministry of Energy and includes representation of all relevant institutions (i.e., energy, agriculture, forestry, waste, industry).

In line with the UAE’s vision 2021, the government has set forth the ‘Green Growth Strategy,’ which is a roadmap for economic growth and social development rooted in sustainable initiatives.<sup>61</sup> The UAE established the Masdar Institute for Science and Technology in partnership with the Massachusetts Institute of Technology, the Dubai Centre of Excellence for Innovative Energy and Water Solutions and the Solar Innovation Center under Sheikh Mohammed bin Rashid al Maktoum Solar Park in Dubai. Moreover, the UAE has established the Local, National, Regional Climate Change Assessment Programme, which contributes to addressing the data challenges across the wider region, as related to climate change adaptation and vulnerability issues and launched the Zayed Future Energy Prize. The

UAE has developed and implemented a National Environmental education & Awareness Strategy and has begun reforming school curriculums to improve science and training, including around climate change. Outside of academics, UAE government entities have launched public awareness campaigns (e.g., “Ecological Footprint Initiative”).

The Regional Collaboration Centre for the Middle East, North Africa and South Asia (RCC) Dubai<sup>62</sup> was established in February 2019 with the signing of an MoU between UN Climate Change and the World Green Economy Organization (WGEO), with the support of the UAE Ministry of Climate Change and Environment (MoCCaE)<sup>63</sup> and the Minister of Climate Change, H.E. Dr. Abdullah bin Mohammed Belhaif Al Nuaimi. In 2019, a partnership on energy between the German and the UAE government was established. A bilateral expert workshop took place in Abu Dhabi in 2019, involving inter alia, H.E. Dr. Matar Al Neyadi, state secretary of UAE’s Ministry for Energy and Industry (MOEI). The UAE has an official

60 <https://unfccc.int/resource/docs/natc/arenc1.pdf>

61 Abu Dhabi’s Economic Vision 2030, as well as Dubai’s Plan 2021 and the Dubai Integrated Energy Strategy 2030 (including the Demand Side Management Strategy), lead the drive towards economic diversification and sustainable development in their respective emirates.

62 <https://unfccc.int/about-us/regional-collaboration-centres/rcc-dubai/about-the-rcc-dubai>

63 <https://www.moccae.gov.ae/en/about-ministry/about-the-minister.aspx>



environment portal [Beetna.ae](https://beetna.ae)<sup>64</sup> and their official state website also hosts a section on climate change.<sup>65</sup> Furthermore, UAEs’ embassies are placing special emphasis on promotion of issues on climate change on their websites (e.g., in the U.S.<sup>66</sup> and in Germany<sup>67</sup>).<sup>68</sup>

## Oman

The Ministry of Environment and Climate Affairs is the focal point for all climate change related communication in Oman. The National Committee for Climate Change provides guidance, coordination, and oversight for all environment and climate change activities. The Committee for the last initial national communication to the United Nations Framework Convention on Climate Change was composed of representatives from 11 ministries. In its development, the Ministry facilitated training programs, which targeted both greenhouse gas inventory development for mitigation and vulnerability assessments under adaptation. As of March 2018, Oman had yet to ratify the Paris Agreement, but the associated Intended Nationally Determined Contribution is available (in Arabic). According to UNDP, “Oman has one of the best records in environmental conservation and pollution control measures to

64 <https://beetna.ae/UAE-Environment>; a collaboration between the Telecommunications Regulatory Authority (TRA) and MoCCaE

65 <https://u.ae/en/information-and-services/environment-and-energy/climate-change/climate-change>

66 <https://www.uae-embassy.org/about-uae/energy/energy-and-climate-change>

67 Website of Germany-based UAE embassy e.g. advertises Middle East-and Africa-focused virtual conference “Shaping the Energy of Tomorrow” (19-21 Oct 2020) on how to build new global energy systems and combat climate change by developing sustainable, reliable, and affordable solutions?, hosted by Siemens AG

68 <https://climateactiontracker.org/countries/uae/pledges-and-targets/>

protect the land, ecology, air, and water.”

## Kuwait

Kuwait’s Environment Public Authority (EPA) is the lead governmental agency and authority for environmental management and climate change-related activities in Kuwait. The EPA reports to the Council of Ministers through the Supreme Council for Environment. The Kuwaiti parliament adopted the Environment Protection Law No. (42) for the year 2014, amended by Law No. (99) for the year 2015, where the law is aimed at curbing the effects of pollution, securing the natural balance of the environment and its resources and ensuring that all relevant entities comply with environmental requirements set by the EPA. The country has also developed a National Strategy and Action Plan (NSAP) for long term greenhouse gas mitigation. Kuwait’s vulnerability to climate change was examined relative to two key sectors: coastal zones and water resources. Kuwait submitted its first Nationally Determined Contribution in 2018.<sup>69</sup>

Other relevant think tanks and institutes in Kuwait:

- Kuwait Institute for Scientific Research (KISR)
- Kuwait Foundation for the Advancement of Sciences (KFAS), created in 1976 with the vision to be “a thriving culture of science, technology, and innovation for a sustainable Kuwait.”

## Qatar

The Ministry of Municipality and Environment (MoE) is the national focal point for climate change in Qatar. The MoE is supported in its function by a national policy formulating body, the “National Committee on Climate Change.”

69 Sustaining Kuwait, “the Quiet Emergency”, <https://sustainingkuwait.org/the-quiet-emergency/background/> (accessed on April 4, 2023).



| Research institute   | Research focus  |
|--|---|
| Qatar Environment and Energy Research Institute (QEERI) (2011)         | Renewable energy resources  |
| Centre for Climate Research (Climate Change Research Institute) (2012) | Mitigation strategies and investigation of climate change impacts                         |
| Gulf Organization for Research & Development (GORD) (2009)             | Managing energy and resources efficiently; sustainable construction in Qatar and the Gulf |
| Sustainable Energy Research Laboratory (2003)                          | Solar technology and environmental policy   |
| Qatar Carbonates and Carbon Storage Research Centre (2008)             | Development of carbon capture and storage (CCS); general reduction of GHG emissions       |

However, the status of the committee is unclear and seems to have phased out. The country has also put forward Qatar National Vision 2030 which contains four pillars: human, social, economic, and environmental development. It is through the fourth pillar that the government seeks to preserve and protect its environment. It strikes a balance between development needs and environmental protection and supports international efforts to address the effects of climate change, for both mitigation and adaptation. However, according to Marie Loumi, the National Vision “as a whole is largely descriptive in style and lacks a quantitative goal.” Qatar ratified the Paris Agreement in 2017 and the associated Intended Nationally Determined Contribution is available. Qatar also created a Designated National Authority.

Several climate-related research institutions (all under supervision of QF):

Other relevant non-governmental organizations and initiatives:

- Abdullah Bin Hamad Al-Attiyah Foundation for Energy and Sustainable Development
- Kahramaa/Qatar General Electricity & Water Corporation launched initiatives such as “Earth Day” and “Green Life Hero” +5-year campaign (Tarsheed) +

Awareness Park to reduce water and electricity demands.

- Petroleum companies such as QatarGas and RasGas have initiatives for maritime protection and biodiversity.
- Environmental BA and MA programmes at Qatar University + Environmental Science Center, Qatar University at Qatar University
- GONGO: Qatar Foundation for Education, Science and Community Development (Qatar Foundation, QF)
- Subsidy: Qatar Environment and Energy Research Institute (QEERI) (since 2011)

## Conclusion and Recommendations

The poor state of the environment is a product of economic development, unrestrained population growth, conflict, and poor governance. In the West Asia region, the environment has been hit hardest where these dynamics have continued to dominate, where the destruction of lives, physical infrastructure, and ecosystems has taken place and left a legacy of toxic pollution, displacement, and destroyed livelihoods. Security is a prerequisite for the implementation of environmental regulation and protection-- so too is a concerned government



attune to the logic of the climate – conflict nexus.

This paper has shown how important environmental issues are to identifying the challenges to human security in all its forms. This is especially the case in states such as Iraq and Yemen which are already experiencing water crises and water scarcity. It is also increasingly clear that many fragile and conflict-affected countries will fail to adopt any development plans unless the negative impacts of conflict on the environment are addressed. Furthermore, the consequences of not adopting stringent environmental plans in weak or failing states will lead to more humanitarian crises, displacement, and conflict.

The international community has a moral responsibility to enable diverse communities to unite and peacefully cooperate to enhance health prospects, establish stability, and build prosperity in their societies and across borders through “environmental citizenship” programs. In this regard, supporting realistic and coherent national environmental governance programs with significant stakeholder engagement will help reduce the probability of conflicts over scarce natural resources and unsustainable practices.

There is no doubt that more can be done to improve air quality, encourage land reform and land use regulations, support anti-dumping practices, and enhance desalination and renewable energy projects. In some cases, leverage may be required to establish a deeper cooperation between neighboring states to ensure more equitable use of shared resources. Only by restoring the ecosystem, can the region recover and realistically achieve Sustainable Development Goals (SDGs) which feed into each of the country’s economic development plans.

Climate change threatens health, food, air, water, shelter, and our safety: it directly impacts the lives and livelihoods of all people in the West Asia region, but especially of those who are already most vulnerable. Climate is a global problem, so diplomacy is a must. In general, there are no regional dialogue or initiatives to tackle the climate-conflict nexus. Recently, the ministers

of environment at the Arab League addressed the issue of the climate-conflict nexus when they discussed the situations in Yemen and Syria.

In fact, much depends on the political will of governorates and states locally and countries regionally to harness existing resources and opportunities and to decide between a climate change context that is backed by peace, equality, and cooperation, or by insecurity, scarcity, and mistrust. Thus, it is of great importance to raise the awareness of various officials and especially diplomats dealing with climate change in the region in order to better equip them with the necessary knowledge and tools to make win-win negotiations.

“

**Climate change threatens health, food, air, water, shelter, and our safety: it directly impacts the lives and livelihoods of all people in the West Asia region.**

”

There is no doubt that governmental investments in resilience efforts help reduce people’s vulnerabilities to livelihood shocks as a result of climate change, which can lower the risk of violent conflict by lessening the chance of people joining armed groups. If countries in the region want their peacemaking efforts, plans, and strategies to be truly sustainable, they need to factor in environmental issues and climate change impacts at all policy stages or any planned response: early warning and assessment, planning and financing, mediation and implementation. In short, environmental issues and climate change can be a tool for peacebuilding, joint cooperation, and sustainable development or a trigger for conflict and unrest inside a country or beyond its borders.



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