

INSS Insight No. 1397, October 29, 2020

Climate Change and Israel's National Security

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The recent heat wave in Israel and the wildfires raging in the country in mid-October, as well as in neighboring Syria and Lebanon, serve as a stark reminder that climate change is happening now, and that its impacts are already felt in the Middle East. Given the expected frequency of heat waves, the reduction in water resources, and rising sea levels in the Middle East, Israel might well face a significant problem of regional instability, accompanied by large numbers of climate refugees at its borders. To better prepare for this dark future, Israel should incorporate climate change into its national security agenda, and integrate climate threats, domestic and abroad, in its national security assessments. Israel should consider the regional scenarios under any adaptation plan, and budget and operate accordingly.

There is clear evidence that the Earth's climate is changing, and we are leaving our "comfort zone" of the Holocene geological era that has resulted in fairly constant climatic conditions on Earth for the last 10,000 years. This is the period in which our civilizations developed around the globe, with fairly constant temperatures, regular rainfall patterns, and stable sea levels. We are now rapidly leaving the Holocene era and entering what some call the Anthropocene, a new climate era influenced by the human race. Since the industrial revolution (~1750) not only has the world population grown from less than 0.5 billion people to more than 7 billion today, but the level of greenhouse gases in the atmosphere today is the highest they have been in at least 1 million years. It is true that the Earth has undergone past ice ages and interglacial warm periods (even warmer than today) over periods of hundreds of thousands of years, but our civilizations did not exist in those periods, and hence if we are focused on the impact on humanity, such analogies are not relevant, and even misleading.

When looking at the risks from climate change in the Middle East, we must consider three categories of risk: the *severity of future hazards* (e.g., wildfires, heat waves, drought, flooding, sea level rise); the *exposure* to these hazards (e.g., population, physical

infrastructures, natural resources); and *vulnerability* vis-à-vis these hazards (e.g., our ability to adapt to such hazards, public resilience, government support).

As in the Mediterranean region as a whole, Israel too has shown significant temperature changes over the last few decades, and the trend is expected to continue. The annual mean temperature in Israel has increased by 1.4 C over the period 1950-2017, with the largest warming occurring in the last 3 decades (~0.53 C/decade). The temperatures started to rise systematically starting in the 1980s. This should be compared with the global warming of ~1 C over the last 130 years! Hence the warming is much more rapid in our part of the world. For the "business as usual" scenario, meaning if present trends continue, the average temperature in Israel is expected to rise from the present (2020) by another 1.2 C by 2050.

Increasing temperatures, particularly in the summer months, will result in temperatures commonly above 37 C, with direct impacts on tourism, the national economy, energy demand for cooling, as well as military operations. Cooling systems on ships, aircrafts, tanks, and other platforms may overheat, interrupting regular activities due to failure under prolonged extreme heat conditions.

Beyond these effects, the more significant risks to Israeli national security incurred by rising temperatures emerge from the weak and fragmented neighboring countries, which lack adequate means to address this trend. Existing ethnic, social, and economic tensions, combined with poor governance, will be compounded by increased heat. An MIT team (2018) found that rising temperatures can even make the wealthy and more stable Persian Gulf states uninhabitable by 2050.

Another manifestation of climate change is the impact on rainfall, although the rainfall data for Israel still offers inconclusive inferences. In the last 30 years, there has been a trend of decreasing rainfall across Israel, similar to the trends for the entire Mediterranean, but these long-term trends in rainfall are not yet statistically significant. In future scenarios, however, relative to the reference period of 1961-1990, we can expect a decrease of up to 25 percent in precipitation amounts by 2100.

Reduced rainfall, together with increased evaporation, will increase the water scarcity in the region and influence water availability, particularly in neighboring countries where desalination is still limited. This will have a direct impact on agricultural yields due to increased droughts, with implications for food security in the region. This joins the continued population growth in Israel and the region. Furthermore, reduced rainfall and increased temperatures will result in more intense wildfires in Israel and beyond, as in the recent forerunners in Israel and some neighboring states.

Given the expected rise in heat waves and the reduction in water resources, rural and urban unrest due to failure of crops is highly likely. Without adequate state response to help the population, such unrest can develop into popular uprisings, as in the Arab Spring and the unrest still ongoing in Syria and other parts of the Middle East. It has been suggested that the unrest in Syria was at least partly triggered by farmers abandoning their fields after a 4-year drought from 2007-2010, moving to cities like Damascus, and after not finding jobs, being recruited to rebel groups, including the Islamic State (ISIS). Such popular unrest can easily lead to violent uprisings and even civil war, and finally to new waves of Middle East and African refugees seeking a better life in Europe.

While the overall annual rainfall is predicted to decrease in the future, the models also predict more intense storms that can produce heavy episodic flooding when storms do occur. Heavy precipitation events can damage infrastructures such as bridges, dams, and roads, often disconnecting parts of the country for hours and maybe days. In the winter of 2019-20, the heavy rain events in the south of Israel had a direct impact on the Israel Air Force.

The third threat from climate change is sea level rise. This may not be a huge direct threat to Israel's security, but it is a major threat to its southern neighbor, Egypt. With a one-meter rise in sea level in the Mediterranean, the Nile Delta will be partially submerged, with cities like Alexandria and Port Said under water. Today, there are more than 6 million people living in these regions, and most will need to be evacuated and resettled. In addition, the Egyptian population is expected to double to 200 million by 2050. This could result in a huge climate refugee problem for the region.

While Israel is a resilient country with potential capabilities to deal with localized extreme weather, flooding, and even heat waves and wildfires, the true threat to its national security lies from outside the borders. Israel's neighboring less resilient countries are much more vulnerable to climate change. Given the expected rise in heat waves, the reduction in water resources, and rising sea levels, we can expect to see more of the trends that preceded the Arab Spring with rural and urban unrest due to crop failures, lack of water, and coastal flooding of cities. It is possible that as a result of climate change, Israel will be faced with a significant problem of regional instability, accompanied by large numbers of climate refugees at its borders.

To better prepare for this ominous scenario, Israel should incorporate climate change into its national security agenda, and integrate climate threats, domestic and abroad, into its national security assessments. Israel should consider the regional scenarios under any adaptation plan, and budget and operate accordingly.

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