

Disruptions in Supply Chains: Climate and Security Aspects

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Global supply chains have been challenged increasingly in recent years, partly due to the COVID-19 pandemic and the war in Ukraine. These challenges join others deriving from long-term geopolitical changes, including deglobalization processes resulting from tensions between the powers and global competition for resources, with the emphasis on minerals that are critical for advanced industries. Combining fundamental challenges to the global supply chains with the climate challenge could create the "perfect storm" that leads to instability and weakens the national security of many countries. Such damage will be especially noticeable in countries like Israel that depend heavily on global supply chains, are particularly exposed to the consequences of climate change, and in tandem, struggle with other important challenges to their national resilience.

The <u>World Meteorological Organization</u> announced that July 2023 was the hottest month ever recorded in human history. Indeed, the consequences were disastrous. Early in the month there were huge wildfires in Canada. Vast amounts of smoke crossed borders and even <u>reached New York City</u>, where the <u>sky turned orange</u>. There was also a wave of fires in <u>Hawaii</u>, where the Governor declared a state of emergency that is still ongoing. <u>Typhoon Doksuri</u> struck China with heavy rain and severe flooding in the province of Jinjiang and other areas, and a historic heatwave was felt all over the Middle East, while breaking records <u>in Israel</u>. A <u>report</u> in 2006 written by Professor Nicholas Stern on the economics of climate change warned of the dangers threatening the global economy if countries fail to take action quickly. Stern also stressed that "Each country, however large, is just a part of the problem." Since the report was published, too few steps have been taken, and humanity is already starting to pay the price of inaction.

The <u>Sixth Assessment Report</u> of the Intergovernmental Panel on Climate Change (IPCC), released on March 20, 2023, states that the past decade was the hottest in the last 125,000 years, and the average global temperature has risen by 1.1 degrees Celsius since the Industrial Revolution. The report notes that global warming will probably bring a rise of 1.5 degrees Celsius by the end of the 21st century, and also warns that unless significant changes are made to the global economy, further warming can be expected, with more unusually hot days, more frequent droughts, increasing desertification, rising sea levels, and increasing frequency of more dangerous extreme events – waves of temperature fluctuations, heavy precipitation, tornadoes, cyclones, and floods. All this demands special preparation in every aspect

of life, including in order to ensure national economic resilience and the supply chain that sustains it.

Climate change, which has a marked effect on every aspect of our lives, impacts supply chains heavily. At present, the private sector bears the responsibility for responding to consumer needs. The business interest of the private sector prompts its efficient and economical attention to consumer needs, so that we as consumers are hardly aware of shortages. The process of globalization and the rules of global trade defined by international organizations, such as the World Trade Organization and the Organization for Economic Co-operation and Development (OECD) have enabled the existence of long and complex supply chains. These chains cover a broad range of countries participating at each stage of the chain; in the pharmaceutical sector, for example, the raw materials for a medical product may come from China, the active ingredient may be made in India, the formulation prepared in Germany, and the finished medicine packaged in Poland before being shipped to its target destination.

Climate change has already had a considerable effect on the global supply chain, particularly for countries that depend heavily on imports of raw materials and finished products. The longer and more complex the supply chains, the more exposed these countries are to disruptions and shortages (IPCC 2023). In 2021, excessive rainfall caused flooding in central China, affecting its ability to supply goods, including coal, pork, and peanuts, and forced the closure of the Nissan car factory. A month later, Hurricane Ida struck the Gulf of Mexico, causing damage to essential industrial facilities, including those that manufacture plastics and pharmaceuticals, forcing delivery trucks to deviate from their routes. In 2022, unprecedented heatwaves struck England, melting a runway at Luton Airport and prompting its closure, and causing damage and closures to railway lines all over the country. Also that year, the severe drought in Europe left parts of the Rhine and Danube Rivers too low for ships to pass, thus affecting trade (Leslie, 2022).

To a large extent Israel depends on its ability to import raw materials and products by sea. Because of its complicated relations with its neighbors, it relies primarily on long supply chains, and overall, Israel is dependent on marine trade. The Israeli economy is characterized by the high proportion of international trade in its GDP, where 99 percent of foreign trade by weight and 65 percent in monetary terms is transported by sea. It is therefore understandable that open ports and shipping routes (SLOC – Sea Lines of Communication) are a strategic necessity for Israel's trade in routine times and in emergencies.

Marine trade is vulnerable to disruption induced by climate changes that affect both the transportation of supplies and vital infrastructures. Heatwaves require changes to working conditions (shorter hours and other restrictions) on the maintenance and construction of ports. Keeping <u>Reefer</u> refrigerated containers cold will require enormous amounts of energy and could overload electrical systems. Heatwaves can also damage roads and tracks in ports, making them too soft to use. Rising sea levels will flood port terminals, damage equipment, and interfere with their operation. Abnormal rainfall could damage transportation infrastructures, flood port facilities, disrupt shipping, and cause delays (UNCTAD 2022).

Moreover, marine trade is exposed to security disruptions. A siege, when a supply chain is interrupted by a military force or any other coercion, would have a direct impact on Israel's ability to function due to its geographic location and geopolitical situation, making it effectively an "island." Naval blockades were imposed by Russia to exert pressure during the opening moves of the war with Ukraine in February 2022 (Gonen, 2022).

Disruptions in supply chains can lead to shortages of the raw materials that are vital for Israeli advanced industrial facilities in the security, climatech, and other sectors, as well as for energy production and food security. National security could also be at risk, since supply problems will echo throughout the Middle East and affect the ability of most of Israel's neighbors to meet the needs of their population and maintain stability. Climate changes are therefore "risk multipliers" that intensify the effects of security difficulties in supply chains. For example, the war in Ukraine has disrupted exports from that country, causing a <u>global grain shortage</u>. In addition, sanctions on marine trade, such as those currently imposed on Russia, Iran, and North Korea, are an economic warfare tactic used by countries or organizations that if used against Israel could be disastrous for its national security.

The raw materials at risk include critical minerals. The <u>latest report</u> on the subject published by the International Energy Agency (March 2022, updated version) surveyed expected disruptions due to climate change, and clarified the importance of continuous supplies of minerals critical to the production of renewable energies. According to the report, demand for these minerals will increase, but climate changes will interfere with their mining and production. Moreover, the complexity of the mining and production processes will augment the need to reduce greenhouse gas emissions. Security industries will also be affected by the shortage of critical minerals. For example, cobalt is an important raw material for the production of lithium-ion batteries used in advanced weapon systems, such as missiles, aircraft, and ships.

Furthermore, Israel's food supplies could be threatened by the effects of climate change: drought, floods, heatwaves, and extreme temperature changes will have an impact on agricultural production in Israel and in the countries from which it imports food. The resulting shortages will lead to considerable price rises. Israel's food supply chains are linked to those of its neighbors – both in terms of competition for raw materials in global markets and in terms of marine transportation. Inter alia, Israel is the entry hub for goods and food intended for the Palestinian Authority, so any disruptions are also relevant for national security due to relations with the PA and the welfare of the West Bank population.

Conclusion

Assuring the continuous function of supply chains is critical for Israel's national security. Unless steps are taken to plan a strategy for critical materials, Israel will be forced to tackle shortages of raw materials and goods at every level, from individual households to security and energy industries. In addition, disruption to supply chains will cause serious economic damage all over the world, and therefore also in Israel, which will find itself looking for alternative routes and goods in times of crisis. Therefore, policymakers should consider the issue of disruptions to supply chains in

general, and those due to climate change in particular, as a strategic issue. Ways to improve the resilience of supply chains must be examined, and responses developed to deal with potential disruptions.

Editors of the series: Anat Kurtz, Eldad Shavit and Judith Rosen