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## Israeli-Palestinian conflict: towards a major logistical and environmental crisis?

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**Abstract.** Since October 2023, the Middle East has once again experienced a dramatic episode in its history, with an Israeli-Palestinian conflict following a bloody terrorist attack on Israeli territory by 3,000 Hamas assailants. At the end of 2023, the Gaza Strip, at the heart of violent fighting, was experiencing a catastrophic situation for its population, leading many NGOs to speak of a major humanitarian crisis. While this is an essential issue, it should not conceal the possibility of a logistical and environmental crisis. This research note highlights the potential impacts of the Israeli-Palestinian conflict, pointing out that they are most often common to all military conflicts. However, a few weeks after the October 2023 terrorist attack, the logistical crisis in global supply chains has been averted, while the environmental crisis is inevitable for the Gaza Strip.

**Keywords.** Environment, Gaza Strip, global supply chains, logistics, military conflict, terrorism, war damage.

### 1. Introduction

The Hamas terrorist attack of October 7, 2023, has sent Israel and many Western democracies into a state of shock (1,200 Israeli deaths in some 20 towns and kibbutzes, around 240 hostages transferred to the Gaza Strip). Faced with an attack of incredible cruelty (murder of babies, children and the elderly, serial rape of young girls, emasculation of men, etc.), contradicting the idea that non-violent *political terrorism* is now the norm (Muhić, 2021), Israel's military response in the Gaza Strip to eradicate Hamas is on a massive scale, and the resulting humanitarian crisis for civilians is being highlighted by a growing number of NGOs, like MSF, as underlined by Mahase (2023), but also by international institutions, including the United Nations. These reactions are understandable when thousands of people are dying under Israel Defense Forces (IDF) bombardment. While the terrible human consequences of the Israeli-Palestinian conflict have already been highlighted, this is not the case for its possible longer-term implications, both for global supply chains and the environment. The Israeli-Palestinian conflict could trigger a major logistical and environmental crisis, especially if it leads to lasting economic destabilization in the Middle East over the next few years.

Any violent conflict has major societal consequences in the country or countries affected: fighting causes many civilian casualties; disease and epidemics are more frequent;

violent crime increases in situations of scarce resources; mass migration to areas outside the fighting generates chaos. Violent conflict also has economic consequences (Kugler *et al.*, 2013). It leads to rising unemployment, as it disrupts economic activity, destroys infrastructures, and generates uncertainty. More generally, economic exchanges undergo structural changes whose effects cannot be predicted over several decades. It is therefore important to address the likely consequences of violent conflict, not only for (essential) humanitarian reasons, but also to examine its impact on various societal and economic facets. The research note offers an initial reflection in this direction.

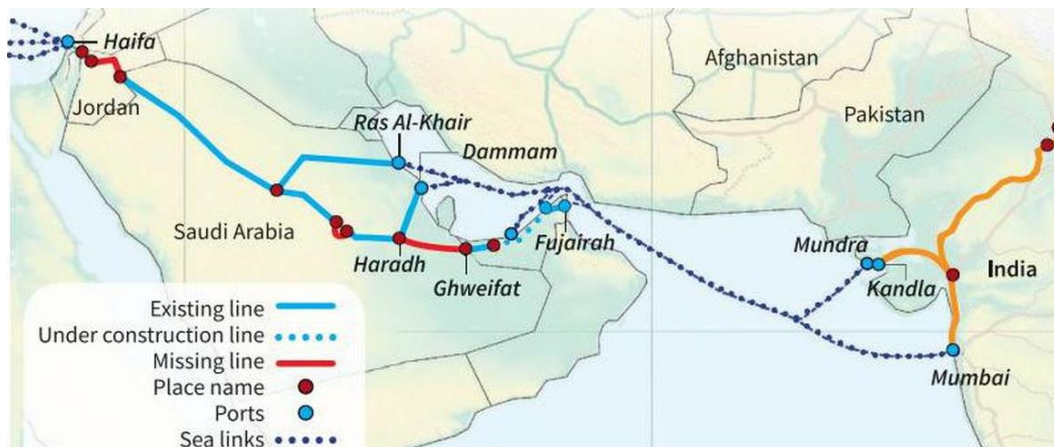
## **2. Global supply chains under threat?**

It hardly needs reminding that the neo-liberal order that has been in place since the 1980s is characterized by the presence of global supply chains in which products are transported over thousands of kilometers. It is not uncommon for components to be manufactured in Asia, then assembled in Mexico, before the finished products are sold in the United States or Canada. As the Covid-19 pandemic and the war between Ukraine and Russia have shown, these global supply chains are sensitive to the slightest “grain of sand”, and the world must learn to live with recurring shortages (Paché, 2022). Any geopolitical tension redraws a large part of the flow map, with a strong impact on the geography of the global economy. This is naturally the case with the Israeli-Palestinian conflict. The direct proximity of both the Suez Canal and the Strait of Hormuz is a source of concern for global supply chain stakeholders, as these are bottlenecks that are highly sensitive to conflict and could rapidly slow down vital supplies in the event of paralysis.

Beyond a confrontation between two entities whose origins go back a long way (at least to 1948, with the creation of the State of Israel), the geopolitical impact of the conflict underway since October 2023 is immense and could ignite the entire Near and Middle East at any moment. By the end of 2023, many Israeli ports were under maximum pressure, and product flows had become very difficult to manage for the various stakeholders in the global supply chains. In Israel, Ashdod, 50 km from Gaza, and Ashkelon, 15 km from Gaza, are regularly on alert, as they are highly exposed to the slightest attack from the Palestinian front. As a result, the business climate has deteriorated to such an extent that some shipowners, including ZIM Line, have not hesitated to apply a “war tax” without ceasing operations. This is because several insurance companies are now imposing a war premium on ships passing through this ultra-sensitive area of the Middle East, and it is highly likely that shipowners will have to pass this on in their rates in the medium term.

The continuation of the conflict and, even more seriously, the lasting destabilization of the region, are likely to complicate the organization of many global supply chains. While it is easy for shipowners to modify routes to avoid sensitive areas of the world, it would be clumsy to ignore the cost of adjustment that this may represent. It is also important to emphasize that Israel is a key element in the India–Middle East–Europe economic corridor (see Figure 1), as noted by Monroe (2023). While it remains at an embryonic stage for the time being, its strategically essential implementation could be significantly slowed down, at a time when China is relentlessly pursuing its One Belt One Road (OBOR) initiative (Rahman, 2022). In short, as we have seen on several occasions in the past, the current Israeli-Palestinian conflict is likely to have a huge impact on world geopolitics, bearing in mind that ideological issues can very quickly contaminate entire zones, which in turn can enter confrontation with each other.

However, reducing the Israeli-Palestinian conflict to a question of a possible logistical crisis on an international scale is highly simplistic. On the one hand, other recent conflicts have also had major impacts on the organization of global supply chains (with a focus on their exceptional capacity for resilience), not to speak about the Covid-19 pandemic mentioned above. On the other hand, it would be a mistake to believe that a *new normal* could emerge without dramatic impacts on populations. If a significant proportion of the Gaza Strip's inhabitants remain trapped there, with no hope of finding refuge in a neighboring country (unless Egypt and Jordan open their borders), they will have to live in a devastated environment, prey to a major environmental crisis. Indeed, even if massive humanitarian aid is provided to support the civilian population, it will take time to set up effective infrastructures to reduce air and soil pollution, as well as contamination of aquifers, not to mention the evacuation of tons of debris and waste.



**Figure 1.** The India–Middle East–Europe economic corridor  
(Source: *The Geopolitical Economist*, September 18, 2023)

### 3. Environmental damage

In times of war, military emissions of greenhouse gases are intensified, as demonstrated by the war in Ukraine. During armed conflicts, CO<sub>2</sub> emissions rise sharply due to the over-consumption of shells, bombs, missiles, and rockets, on the one hand, and the over-consumption of fuel by land units, naval forces, and air units, on the other. Fires caused by fighting also generate large volumes of CO<sub>2</sub>: fuel depot and oil infrastructure fires, waste, and debris fires and, finally, forest and field fires. This indisputable fact is underlined in the contribution by Mukete *et al.* (2016). It is difficult to quantify at the end of 2023 the environmental effects (greenhouse gas emissions) of the Israeli-Palestinian conflict resulting from the Hamas terrorist attack. However, an idea of the possible future environmental crisis can be gained from the findings of two past conflicts and the destruction recorded in the Gaza Strip for these occasions.

First case: the 2008-2009 operation. On December 27, 2008, the IDF initiated Operation Cast Lead in Gaza Strip, with the aim of striking Hamas infrastructure and rocket launching pads. This followed persistent firing from the Gaza Strip, targeting Israeli civilians. The operation ended on January 18, 2009, after a unilateral ceasefire declared by Israel, and followed by Hamas 12 hours later. According to a report published by the United Nations Environment Programme (2009), which details all the environmental damage caused by the

bombardments and ground fighting, 2,692 buildings and 186 greenhouses were destroyed or irreparably damaged. This destruction generated 600,000 tons of debris and rubble, in which the presence of asbestos was massive. Air pollution was intense due to combustion particles and was exacerbated by the toxicity of the debris.

Two other ecological problems need to be highlighted: wastewater management and the deterioration of agricultural land. In the Gaza Strip, wastewater is often discharged directly into the sea (via the Wadi Gaza River, for example), despite the existence of the Az Zaitoun wastewater treatment plant. However, a breach in the dike following a bombardment caused 100,000 m<sup>3</sup> of wastewater to spill into the sea, polluting 55,000 m<sup>2</sup> of farmland. This agricultural land was particularly hard hit. According to another study by the United Nations Development Programme, 17% of agricultural land was destroyed during Operation Cast Lead, as well as 17.5% of orchards and 9.2% of pastures, ploughed by tank tracks and polluted by fuel and munitions residues. Finally, the United Nations recorded the death of some 35,000 cows, sheep, and goats, and a million poultry. The mass of these carcasses, which have rotted in the open air and polluted the soil, is estimated at between 1,000 and 1,500 tons.

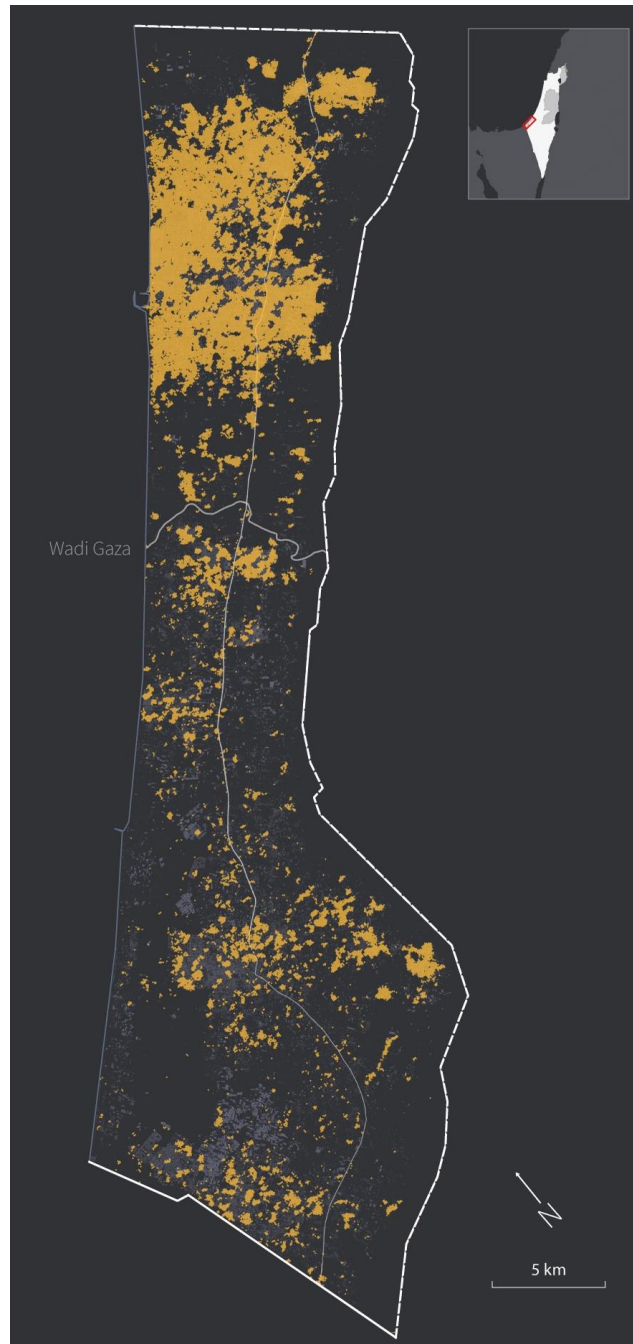
Second case: the 11 days of war in May 2021. A study conducted by Edwards (2022) on behalf of the Conflict & Environment Observatory looks at the impact of the bombardments on the sewage and water distribution networks in the Gaza Strip. According to data from the United Nations' Water Sanitation & Hygiene (WASH), in May 2021, 109 of the 290 water-related infrastructures were involved in wastewater treatment. WASH estimates that one million inhabitants of the Gaza Strip have been directly affected by the destruction of these networks, with water cuts, drastic rationing and, above all, wastewater spills into streets, fields, reservoirs, and the Mediterranean. In terms of health, these discharges posed serious risks to the population, particularly with infections that could not be treated with antibiotics, an upsurge in the risk of epidemics, and so on. Delays in infrastructure renovation work meant that the effects of the spills could not be rapidly reduced, while heavy rains in January and November 2022 on the Gaza Strip increased the size of the areas where polluted water had been stagnating since May 2021. AbuHamed *et al.* (2023) have also analyzed in depth the delicate management of the countless demolition wastes after the 11 days of war

#### **4. Initial observations on the 2023 conflict**

As mentioned, it is difficult to compare one conflict with another, even if they always involve the same territory. However, the virulence of Israeli strikes and ground fighting raises fears that by the end of 2023, the environmental impacts will be at least as great as those of 2008-2009 and 2021. At the end of November 2023, official data seem to confirm this point. A map drawn up by the United Nations Satellite Centre (UNOSAT) shows that between 38,200 and 44,500 buildings in the Gaza Strip were damaged or destroyed by the fighting between October 7 and 29, 2023 (between 82,000 and 105,000 buildings in early December 2023). Figure 2, taken from work by Corey Scher (CUNY Graduate Center) and Jamon Van Den Hoek (Oregon State University), and quoted by Bijotat (2023), shows damage in the Gaza Strip between October 7 and December 4, 2023, from Sentinel-1 (Copernicus) data. It should be remembered that during Operation Cast Lead, only 2,692 buildings were affected, but in the meantime, the urban space of the Gaza Strip has become much denser. Biodiversity on land is then under threat, just as it is at sea from uncontrolled dumping and ruptured pipes.

The Israeli-Palestinian conflict, which began in October 2023, could ultimately have effects comparable to those of previous conflicts in terms of environmental crisis, notably on water networks and the quality of water with little or no treatment (in 2018, according to the United Nations, 92% of the water drawn from the ground was unfit for human consumption in the Gaza Strip), on the decommissioning of numerous wastewater treatment plants, and on road infrastructures. However, the high intensity of the conflict in 2023 suggests a much more severe environmental crisis, unless a reconstruction and development plan are put in place very soon after the end of hostilities. There seems to be nothing comparable for the logistical crisis mentioned at the beginning of this article. Indeed, the impact of the Israeli-Palestinian conflict on the organization of global supply chains will remain rather modest by the end of 2023. It has not called into question the omnipresence of the major “logistical spokes” that have been in place for five decades, and whose functioning has not been altered in any way.

If this situation were to persist, it would mean that we are ultimately dealing with a military conflict whose most significant impacts are local (environmental crisis in the Gaza Strip), not international (logistical crisis on a continental scale). Observers focusing on the economic dimensions will no doubt be pleased, but this will certainly not be the case for observers focusing on the environmental dimensions. The way in which the Israeli-Palestinian conflict is viewed and analyzed rekindles an old opposition between two approaches to the neo-liberal world: protecting *business as usual* at all costs or proposing alternative models that consider the well-being of populations as a priority. It is not certain that the political debate, sometimes heated since October 2023 in many countries, is at this level. However, it is essential to understand that behind any geopolitical tension there are often hidden realities that need to be brought to light. Knowledge for action: this is what must guide us in the better understanding of our societies.



**Figure 2.** Damage in the Gaza Strip according to an analysis of satellite radar images (from October 7 to December 4, 2023) (Source: Corey Scher and Jamon Van Den Hoek, December 2023)

## 5. Conclusion

Once the Israeli-Palestinian conflict that began in October 2023 is over (and the war between Ukraine and Russia is also over), the time will come to initiate reconstruction programs. This post-conflict phase is nothing new, as it had to be dealt with in many European countries after the WWI and, above all, after the WWII. The current situation,

however, is very different, as the economic context is difficult, and global issues such as climate change could quickly lead to an oversight of the environmental situation of the tiny Gaza Strip, which covers an area of just 360 km<sup>2</sup> (41 km long, 6 to 12 km wide). Furthermore, studying the case of the 2015 war in Yemen, Gaghman (2020) highlights how the collapse of social and economic frameworks, but also of the infrastructural system, has had dramatic consequences on access to food and health services. More broadly, says Gaghman (2020), the reconstruction and recovery of a country requires both repair of the social fabric and transparent governance of a participatory nature. However, the situation in the Gaza Strip can only be analyzed with reference to a geopolitical situation that has been tense for over 75 years, which will make it difficult to improve governance without a thorough examination of the legitimacy of each party's ancestral expectations. As Gelvin (2021) sums up, the origins of the tragedy lie in a terrible fact: *a land claimed by two national communities*.

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