



HIDE AND SEEK, HIDE AND FIRE: HAMAS AND THE TUNNEL THREAT

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Since October 7, over 1500 underground shafts and passages have been encountered by the IDF in their operations against Hamas¹. The use of these tunnels is not new to the Israeli forces, nor is their exploitation a novelty in conflict more in general. However, the use of underground spaces has become more and more recurring in modern confrontations.

Tunnel use can be traced back to thousands of years ago: Assyrian carvings show engineering units belonging to Sargon of Akkad, undermining the walls of enemy cities; although Homer's Iliad contains no mention of such activities, archaeological evidence from excavations at Troy shows a number of underground passages crossing beneath the city's walls, which might have been

¹ Adolfo Arranz et al., "Inside the Tunnels of Gaza," *Reuters*, December 31, 2023, <https://www.reuters.com/graphics/ISRAEL-PALESTINIANS/GAZA-TUNNELS/gkvlmzorvb/>.



part of a siege; and the Romans often used tunneling operations in their conquests². Yet, a more transparent influence can be seen with the evolution of fortifications; during the Medieval Age, the subterranean dimension was used as a means to bypass the walls and launch a surprise attack from the interior³. With the introduction of gunpowder, tunneling became even more offensive, as testified by the American Civil War⁴. Tunnels have also been exploited during World War II, by the Japanese who used cave warfare against US Marines. Amidst the Cold War too, the Chinese resorted to tunnel warfare in Korea against US infantry; and finally, tunnels were widely used in Vietnam by the Viet Cong, where underground warfare was taken to another level. Indeed, while field fortifications and tunnel systems were typically thought of as defensive in nature and as active protective measures, the Viet Cong also employed them offensively, with the purpose of both fighting and survival⁵.

From the mountains and rural regions in Afghanistan and Iraq, to the Gaza Strip and cross-border areas with Israel, underground warfare has made its comeback in the modern battlefield of the Middle East and elsewhere. Besides their extensive use by Hamas already since the early 2000s, tunnels have also been exploited by the Islamic State in Iraq and Syria, both in mountain areas and in cities, where they were used for defensive and offensive purposes. Furthermore, underground spaces have been featured in urban battles of the current war against Ukraine, such as Mariupol and Bakhmut. Historical examples and more recent occurrences show that tunnels are incredibly versatile and intrinsically embody an element of surprise, which can be used as an equalizer against state's military power and capabilities. Additionally, more recent employments also stress the conundrum

² Paul J Springer, "Fighting Under the Earth: The History of Tunneling in Warfare," *Foreign Policy Research Institute*, 2015.

³ Springer.

⁴ Springer.

⁵ Gordon Rottman, Lee Ray, and Chris Taylor, *Viet Cong and NVA Tunnels and Fortifications of the Vietnam War* (Oxford: Osprey Publishing, 2006).



between underground and urban warfare. Yet, there still seems to be a lack of a clear understanding of the underground threat, as well as of how to develop doctrine, strategy, and tactical guidelines to cope with it. Failure to comprehend the role of tunnels during both peace and war times can have important and diverse consequences across the political-military-legal spectrum.

Defining Underground Warfare

Underground Warfare is intended as the use of tunnels and of the subterranean dimension in war. It often includes the construction of underground facilities in order to attack or defend, and the use of existing natural caves and artificial underground facilities for military purposes.

Tunnels are incredibly versatile and relatively accessible, which complicates their definition and understanding. When assessing the threat and risks of tunnels, the following parameters may apply:

- *Who*. It is important to understand whether the tunnel is owned by a hostile or a non-hostile party.
- *Where*. The location of the tunnel can give insights for understanding its purpose and the extent to which it can or will be a threat. For instance, is the tunnel located in the territory of a single state, or is it a cross-border tunnel? Is the starting point of the tunnel identifiable?
- *When*. Was the tunnel man-made or inherited? The latter can be improved and expanded. The former, when dug in times of peace might be more suspicious and entail a higher level of uncertainty; however, tunnels dug in times of war may have a greater impact on the conflict and the relative balance of power.
- *What*. What is found in the tunnels may suggest why the tunnel has been dug.
- *Why*. What is the purpose of tunnels? In general, tunnels are perceived as granting a military advantage, and can thus be used to fulfill multiple functions (e.g. smuggling, hiding, offensive attacks,...).



- *Against whom.* History shows that tunnels have been extensively used in wars, but while before they were exclusively against the enemy's forces, recent exploitation of the subterranean has also targeted civilians.

A close look to Hamas tunnels

Who is Hamas?

The Islamic Resistance Movement or *Harakat al-Muqawama al-Islamiya* (Hamas) is an Islamist organization which emerged in the early months of the first Palestinian *intifada* in 1987-91. Since it took over the area of the Gaza strip in 2007, it has been the *de facto* governing authority. Originally rooted in the Gaza branch of the Muslim Brotherhood, the doctrine of Hamas is one of Islamic nationalism, meaning that it functions within the context of defined nation-state boundaries, those of Palestine⁶. This movement was founded with the goal to pursue an armed struggle against Israel and liberating historic Palestine.

Tunnel history and initial use

Hamas' use of tunnels can be divided into three broad categories: smuggling (or economic) tunnels, which are the very first ones to appear, used to smuggle arms, goods and then people; secondly, defensive tunnels, meant to assist Hamas by giving its soldiers freedom of movement for hiding and/or retreating, as well as for storing ammunitions and other weapons; and, finally, the terror tunnels, employed in order to carry out kidnapping and attacks against the IDF and civilians.

It is not known exactly when Hamas began digging tunnels, but what is certain is that the use of underground spaces between the Gaza Strip and the Sinai Peninsula dates to soon after the peace

⁶ Antony Best et al., "The Rise of Political Islam, 1928-2014," in *International History of the Twentieth Century and Beyond* (Routledge, 2014), <https://doi.org/10.4324/9781315739717>.



accords were signed between Israel and Egypt in 1979, and long before the digging of cross-border tunnels between Gaza and Israel⁷. Smuggling business started in Rafah during the 1980s, with Israel's first recorded discovery of a tunnel in 1983⁸. The underground expansion proceeded throughout the 1990s, and tunnel infrastructures between the Sinai Peninsula and the Gaza Strip were extensively used for smuggling goods, construction of material and weapons. At this initial stage tunnels were used merely for economic purposes. When Hamas took over the Gaza Strip in 2007, tunnels became one of its largest sources of income⁹ and, on the other hand, gradually started to represent both an economic and security threat for Egypt¹⁰. Therefore, when the then Egyptian President Mubarak, jointly with Israel, imposed the Gaza blockade¹¹, this decision only made underground smuggling more attractive. As an effort, in 2009 Egypt began the construction of a steel barrier along its border with Gaza, projected to go 60 feet into the underground in order to prevent tunneling activities¹²; whilst this barrier did not destroy all Hamas tunnels, it did make digging activities more time-consuming. Nevertheless, the barrier was penetrated by the Palestinian smugglers within a year¹³.

Tunnels in Israel-Hamas confrontations

The Egyptian experience is an example of how Hamas started to make an initial use of tunnels for economic purposes. However, the

⁷ Daphné Richemond-Barak, "Tunnels in Conflict," in *Underground Warfare* (n: Oxford University Press, 2018), 1-36.

⁸ Nicolas Pelham, "Gaza's Tunnel Phenomenon: The Unintended Dynamics of Israel's Siege," *Journal of Palestine Studies* XLI, no. 4 (2012): 4-25, <https://doi.org/10.1146/annurev.fluid.32.1.477>.

⁹ Ehud Yaari and Eyal Ofer, "Gaza's Economy: How Hamas Stays in Power," January 6, 2011.

¹⁰ Richemond-Barak, "Tunnels in Conflict."

¹¹ "Israel's 'Blockade' of Gaza," accessed March 26, 2020, <https://www.jewishvirtuallibrary.org/israel-s-quot-blockade-quot-of-gaza>.

¹² Rory McCarthy, "Egypt Building Underground Metal Wall to Curb Smuggling into Gaza," *The Guardian*, 2009.

¹³ Richemond-Barak, "Tunnels in Conflict."



exploitation of the underground has been significantly more threatening and more peculiar to Hamas' tactics and strategy in its confrontations against Israel. During the first years of the 2000s, Israeli involvement with Hamas' underground spaces was rather limited. Nevertheless, in the interim of the Second Intifada, beginning in September 2000, Hamas made use of attack tunnels that were dug opposite to the IDF sites along the Philadelphi Route - i.e. Egypt-Gaza border¹⁴. These tunnels enabled the organization to lay powerful explosive charges beside the IDF positions to destroy them. Moreover, when in 2005 Israel withdrew from the Gaza Strip, and Hamas intensified its presence in the region, the nature of the tunnels began to shift from smuggling goods to also moving weapons and people. These underground passages which led from Gaza into Israel were worryingly dug in civilian proximity - this being a distinctive trait compared to those used along the Egyptian border. A turning point was marked on the 25th of June 2006, when Hamas operatives attacked a tank on the Israeli-Gazan border; two soldiers were killed and a third one, Gilad Shalit, was captured through a tunnel hundreds of meters long¹⁵.

After 2007 the border city of Rafah became the real economic capital of the Gaza Strip and, at the same time, the main target of Israeli anti-smuggling operations¹⁶. As an effort, in early November 2008 Israel launched a limited operation aimed at destroying a tunnel which was a central route for weapons coming into Gaza¹⁷. However, dozens of tunnels were said to crisscross between southern Gaza and Egypt's Sinai Desert, used to provide food supply after Israel's blockade¹⁸. Besides, Hamas continuously

¹⁴ Jonathan D. Halevi, "Hamas's Attack Tunnels: Analysis and Initial Implications," Jerusalem Center for Public Affairs, July 2014, <https://jcpa.org/hamas-attack-tunnels/>.

¹⁵ Amos Harel, "How Were Palestinian Militants Able to Abduct Gilad Shalit?," Haaretz, October 18, 2011, <https://www.haaretz.com/1.5200670>.

¹⁶ Richemond-Barak, "Tunnels in Conflict."

¹⁷ Antony Best et al., "The Arab-Israeli Conflict, 1949-2014," in *International History of the Twentieth Century and Beyond*, n.d.

¹⁸ "Gaza Braces for All-out War | News | Al Jazeera," accessed March 21, 2020, <https://www.aljazeera.com/news/middleeast/2008/12/200812290235503915.html>.



responded with heavy rocket fires and increasing attacks against Israel. As a response, the Israeli forces launched Operation Cast Lead. In this operation, the IDF targeted around 40 smuggling tunnels, but soon realized that air-strikes were not sufficient, and that only a ground operation would actually destroy the subterranean passages.

Soon after the confrontation, Hamas immediately started rebuilding its military capabilities. The ceasefire at the end of Operation Cast Lead enabled the Islamic organization to undertake repairs on the partially destroyed tunnels and to oversee a major overhaul of the complex, even reducing taxes to stimulate the work¹⁹. As a result, tunnels were encountered four years later in Operation Pillar Defense (2012), during which the IDF targeted over 120 of them; the operation reduced Hamas' military capacity, but it did not destroy it²⁰, and the Islamic organization was able to recover and expand its tunnel capabilities²¹.

Already in October 2013, the Israeli Defense Forces, acting upon information received from an unidentified source, discovered a subterranean passage leading from Gaza into the Israeli territory²². The tunnel, with a total length of 1,800 meters, stretched 300 meters into Israel, and was later claimed to be the work of Hamas²³. BGen Eldestein, Commander of the Gaza division, affirmed that the underground complex was extremely advanced and well prepared, equipped with food and electricity²⁴. The objective of this tunnel would have been to surprise the enemy and strike a deadly blow

¹⁹ Pelham, "Gaza's Tunnel Phenomenon: The Unintended Dynamics of Israel's Siege."

²⁰ Best et al., "The Arab-Israeli Conflict, 1949-2014."

²¹ Daniel Rubenstein, "Hamas' Tunnel Network: A Massacre in the Making," in *The Gaza War 2014: The War Israel Did Not Want and the Disaster It Averted* (Jerusalem Center for Public Affairs, 2015).

²² Nicole J Watkins and Alena M James, "Digging Into Israel: The Sophisticated Tunneling Network of Hamas," *Journal of Strategic Security* 9, no. 1 (2016): 84-103, <https://doi.org/10.5038/1944-0472.9.1.1508>.

²³ Watkins and James.

²⁴ Joshua Davidovich, "IDF Says It Exposed Massive Gazan 'terror Tunnel'," *The Times of Israel*, March 21, 2014.



which would have not allowed for a chance of survival or escape²⁵. Other tunnels were discovered as well and, likewise, the Israeli Ministry of Foreign Affairs noted that these were far more sophisticated, being longer, deeper, more difficult to uncover and well-equipped²⁶. The following year, Hamas Prime Minister delivered a speech in which he stressed the strategic importance of attack tunnels²⁷. In this respect, it has been estimated that Hamas dedicated around 40% of its budget to the construction on its tunnel network project²⁸. At this point their use went beyond the purpose of kidnappings or smuggling; it is worth noting a series of attacks that were carried out during this period: on 17th of July 2014, around 13 Palestinians infiltrated Israel through a tunnel near Kibbutz Sufa, heavily armed with RPGs (i.e. rocket-propelled grenades) and assault rifles, and were prepared to carry out a massacre²⁹; again, only two days later, Hamas terrorists infiltrated Israel in three separate incidents, some of them wearing Israeli uniforms³⁰; on the 21st of July, another infiltration occurred³¹. The same dynamics took place also on the 28th of the same month, when Hamas fighters entered Israel undetected via a tunnel near Kibbutz Nahal Oz, attacked an IDF post and killed five IDF soldiers³²; likewise, on the 1st of August Hamas terrorists emerged from a tunnel in Rafah³³. For the first time, tunnels were regarded

²⁵ Terrence McCoy, "How Hamas Uses Its Tunnels to Kill and Capture Israeli Soldiers," *The Washington Post*, July 21, 2014.

²⁶ "Hamas' Terror Tunnels"

<https://mfa.gov.il/MFA/ForeignPolicy/Issues/Pages/Hamas-terror-tunnels.aspx>.

²⁷ Halevi, "Hamas's Attack Tunnels: Analysis and Initial Implications."

²⁸ Richemond-Barak, "Tunnels in Conflict."

²⁹ Rubenstein, "Hamas' Tunnel Network: A Massacre in the Making."

³⁰ Mitch Ginsburg and Toi Staff, "Seven IDF Soldiers Killed in Battles with Hamas Early Monday," *The Times of Israel*, July 21, 2014,

<https://www.timesofisrael.com/seven-more-idf-soldiers-killed-in-battles-with-hamas/>.

³¹ Yaakov Lappin, "WATCH: 10 Terrorists Killed Attempting to Infiltrate Israel through Tunnel," *The Jerusalem Post*, July 21, 2014,

<https://www.jpost.com/Operation-Protective-Edge/Hamas-terrorists-caught-killed-attempting-to-infiltrate-Kibbutz-Nir-Am-through-tunnel-364148>.

³² Rubenstein, "Hamas' Tunnel Network: A Massacre in the Making."

³³ Harriet Sherwood, "Inside the Tunnels Hamas Built: Israel's Struggle against New Tactic in Gaza War," *The Guardian*, August 2, 2014,



as a significant threat by the Israeli forces, given also the great amount of diversity of tunnel-related attacks. Besides being a threat for the IDF, people became greatly concerned and afraid that Hamas terrorists could emerge within their homes³⁴. During the summer of 2014 the IDF destroyed 33 tunnels, and 15 of these reached as far as 1.5 miles into Israel at the start of Operation Protective Edge³⁵. Although the IDF claimed to have destroyed all of the organization's network which posed a threat to Israel during Operation Protective Edge, shortly afterwards several media sources posted stories and interviews held into a Hamas terror tunnel³⁶. Several efforts were made by Israel to neutralize the threat of cross-border tunnels since the end of confrontations in 2014, investing time and resources on ways to detect digging operations and existing tunnel, as well as updating combat training and intelligence³⁷.

A few years later, in May 2021, the revival of the violence between Gaza and Israel was arguably the most intense escalation since 2014. During the 11 days fighting, the Israeli military estimated Hamas had roughly 300 miles of tunnels running under Gaza, calling it *the Metro*³⁸. The role of the subterranean realm in the confrontation was undoubtedly significant. Tunnels were used for moving weapons, mobilizing soldiers, defense, and offense. The

<https://www.theguardian.com/world/2014/aug/02/tunnels-hamas-israel-struggle-gaza-war>.

³⁴ Rubenstein, "Hamas' Tunnel Network: A Massacre in the Making."

³⁵ Benjamin Runkle, "Preparing for Warfare's Subterranean Future," *War On The Rocks*, 2015.

³⁶ "Operation Protective Edge: Hamas Terror Tunnels," accessed April 3, 2020, <https://www.jewishvirtuallibrary.org/operation-protective-edge-hamas-terror-tunnels>.

³⁷ Arie Egozi, "Israelis Test Classified Tunnel Tech To Stymie Terrorists; US Watches," *Breaking Defense* (blog), August 13, 2019, <https://breakingdefense.sites.breakingmedia.com/2019/08/israelis-test-classified-tunnel-tech-to-stymie-terrorists-us-watches/>.

³⁸ "Israel Struggles to Destroy Hamas's Gaza Tunnel Network - WSJ," accessed March 18, 2024, <https://www.wsj.com/world/middle-east/israel-struggles-to-destroy-hamass-gaza-tunnel-network-fb641122#:~:text=Disabling%20the%20tunnels%2C%20which%20run,ability%20to%20maneuver%20around%20the>.



latter in particular remarks a substantial shift to the urban dimension, whereby Hamas embedded its military operation in Gaza's densely populated areas. In particular, by attacking and launching rockets from civilian locations, Hamas aimed dissuading Israeli forces from launching strikes that would entail excessive civilian casualties. Eventually, Israeli airstrikes targeted a number of buildings and faced (once again) criticism for raising the civilian death toll³⁹. These concerns are an excellent prelude for the considerations that can be made in light of the current confrontations. The war which started in October 2023 is the first one in which the underground network is defining feature of the overall political-military strategy of Hamas. As a matter of fact, IDF have devoted substantially more attention to Hamas tunnels since October. The underground network built by Hamas aims not only at gaining a military advantage, but also a political one. While the subterranean serves all previously described functions, such as defense and offense, it now also includes a much - and unprecedentedly - stronger societal and civilian character: destroying the tunnels is virtually impossible without adversely impacting the population living in Gaza. This has remarkable consequences for targeting choices and respecting the laws of war on distinction for the Israeli side - a theme which is at the height of concerns on the current conduct of war.

Implications of the tunnel threat

The use of tunnels is by no means unique to Gaza, yet the case of Hamas provides among the most concerning examples on the extensive and threatening use. Importantly, it makes a clear case for the fact that the tunnel threat should not be underestimated, since it does not remain a contained challenge, but rather has important military, legal and psychological implications.

³⁹ "Gaza, Hamas and the Risk to Civilian Life during Operation Guardian of the Walls: A Brief Analysis - Occupied Palestinian Territory | ReliefWeb," June 22, 2021, <https://reliefweb.int/report/occupied-palestinian-territory/gaza-hamas-and-risk-civilian-life-during-operation-guardian>.



The pathways of the use of tunnels by Hamas highlights their versatility: the very first ones in the 1990s and at the beginning of the 2000s were employed merely for economic purposes and did not directly own a violent character. The kidnap of the Israeli soldier Shalit in 2006 was a turning point in that it indicated that the underground could work for other purposes as well⁴⁰ - i.e. kidnapping and directly engaging with the enemy. In Operation Cast Led, Hamas acknowledged that Israel owned strong airpower capabilities they could not compete with. Here, tunnels were a valuable solution in order to transfer the confrontation into the urban and underground realm, forcing the Israeli forces to go on ground and fight in highly densely populated areas they were not familiar with. Likewise, in Operation Cast Led, the IDF once again merely engaged with air operations; albeit it targeted a huge number of tunnels, these still came in second place compared to rockets and other military capabilities. The same scenario characterized Operation Protective Edge, during which Hamas even upgraded and transformed tunnels in living places, as well as for meeting and planning further operations⁴¹.

Besides these tactical and operational challenges on battlefield, tunnels also bear implications for military training: soldiers need to be trained on important matters such as topography and should become more accustomed with new equipment needed for subterranean areas. As the case of Hamas shows, tunnels require specific and accurate technology detection systems: the Israeli experience of the first confrontations with tunnels shows an underestimation of the fact that available technology could have worked, which conversely proved to be insufficient. Each tunnel had different locations, this implying not only a geographical but also a geological diversity- that is, whether it is dug into a hill, a mountain rock, fortified with cement, containing wires, etc. This

⁴⁰ Rubenstein, "Hamas' Tunnel Network: A Massacre in the Making."

⁴¹ "Hamas Terrorists Confess to Using Human Shields", <https://www.idf.il/en/articles/hamas/hamas-terrorists-confess-to-using-human-shields/>.



proves to be quite challenging for mainly two reasons: in the first place, it notably is resource-intensive, requiring extensive funding for technology, as well as time and accuracy to be developed; this is especially due to the fact that every technology will react differently to the type of geology. Moreover, Israel has never, and for the moment cannot be certain if all tunnels have been destroyed - as the IDF have witnessed increasing and more sophisticated reappearance throughout the past years and confrontation.

Besides, both the clashes in 2021 and the on-going war testify that many tunnels are dug near or within civilian areas as a cover and protection for underground activities. From an International Law point of view, this means that a state is not allowed to target these infrastructures, as set forth in the Laws of War. Whether these infrastructures can be considered as military objectives, and accordingly how should states make the distinction between combatants and civilians in this instance is one of the greater matters of debate in the Israel-Gaza setting. Finally, tunnels can eventually generate a psychological fear in the soldiers fighting into them, who might not know what they can find behind the corner; and in the population as well, since citizens can be afraid to have Hamas soldiers suddenly emerging into their homes. These are important implications which, overall, further support the need to have a greater attention on underground threats and warfare.



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