

# Fitful Infrastructures: Dwelling with Infrastructural Elimination in Gaza

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**Abstract:** Since 7 October 2023, Gaza has been subjected to unprecedented Israeli genocidal violence that has erased its life-supporting infrastructure. To understand how Gazans navigated these catastrophic conditions—or what we call “infrastructural elimination”—by inventing ephemeral practices using scarce materials at hand, the paper examines “fitful infrastructures”. We scrutinise the material formation of three infrastructural practices: constructing makeshift toilets for tents, water collection and management practices, and improvised methods of generating electricity. Fitful infrastructure, we argue, (i) comprehends infrastructure through what its absence and elimination incapacitates, (ii) centres the material practices of the bombed rather than the logic of bombing in thinking the forced reformation of everyday dwelling/survival, and importantly (iii) highlights, without glorification, fragile and volatile infrastructures as material manifestations of life irreducible to aims of the settler colonial state to eliminate conditions that support it.

**نبذة:** تعرّض قطاع غزة منذ السابع من أكتوبر لعنف إباضي إسرائيلي غير مسبوق، حيث تم محو البنى التحتية الحيوية نستقصي في هذه الورقة البحثية مفهوم “البنى التحتية المتقلبة”، لفهم كيفية تعامل سكان قطاع غزة مع هذه الظروف الكارثية – أو ما نسميه “محو البنى التحتية” – من خلال ابتكار ممارسات مؤقتة باستخدام المواد نادرة الوفرة. على وجه التحديد، تطرّق الدراسة الى التكوين المادي لثلاث ممارسات: بناء مراحيض مؤقتة في خيام النزوح، وممارسات جمع وإدارة المياه، وطرق توليد الكهرباء. نحتاج في هذا المقال أن البنية التحتية المتقلبة أولاً: نفهم من خلال ما يُعيق غياب البنية التحتية الحيوية والغاؤها – أي محوها؛ ثانياً: تُركز على الممارسات المادية لأولئك الذين تعرضوا للقصف وسُبل إعادة تشكيل المأوى اليومي بدلاً من التركيز على منطق القصف؛ وثالثاً: تُبرز، دون تمجيد، البنى التحتية الهشة والمتقلبة كتجليات مادية للحياة غير قابلة للاختزال في أهداف الدولة الاستعمارية الاستيطانية للقضاء على الظروف التي تدعمها.

**Keywords:** infrastructure, Gaza, infrastructural elimination, fitful infrastructure, material politics, war, dwelling, settler colonialism

**الكلمات المفتاحية:** البنية التحتية، غزة، محو البنية التحتية، البنية التحتية المتقلبة، السياسات المادية، الحرب، العيش، الاستعمار الاستيطاني

## Introduction

Since 7 October 2023, the Gaza Strip has been engulfed in a destructive eliminatory military violence that at the time of writing has been ongoing for 15 months. Israel’s military operations, including land invasions and massive aerial and carpet

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bombings with destruction power equivalent to several Hiroshima atomic bombs, have already killed more than 61,000 people, mostly civilians (at least 17,000 children), while wiping out entire neighbourhoods and completely shattering the critical infrastructure in Gaza (Al Jazeera 2025). These belligerent acts, that according to UN Secretary-General António Guterres show “total absence of an effective protection of civilians” (Reuters 2024), have created an unprecedentedly destructive crisis, unrivalled in pace since the Second World War (Lederer 2024), which will lead to a decades-long rebuilding project (UNDP 2024). According to the United Nations, already within a year, ~63% of all structures (including >60% of residential buildings, >80% of commercial buildings, and > 68% of the road network) have been damaged, and around 80% of the people in Gaza displaced (Security Council Report 2024; UN News 2024; UNOSAT 2024). This has not only paralysed the distribution of life-supporting services across the Strip, resulting in catastrophic failures in securing the everyday necessities, but also created fatal conditions of weaponised famine, starvation and spreadable diseases, such as the outbreak of polio (Save the Children 2024; Security Council Report 2024). Israel has deliberately destroyed the material conditions necessary for the supply of water, food, fuel, and electricity in the Gaza Strip. It has bombed bakeries, major food stores, food distribution shelters, water stations, warehouses, and more, while simultaneously crippling local food production and preventing a stunning 87% of the coordinated humanitarian aid from reaching its destination (Al Jazeera 2023; OCHA 2024a). Based on the full materialisation of the logic of elimination, always at the centre of Israel’s/Zionist settler colonial project in Palestine (Agha et al. 2024; Englert 2022; Salamanca et al. 2012), the current situation witnesses what we call here *infrastructural elimination*: a state of extreme annihilation and incapacitation of life-supporting infrastructural conditions in Gaza. To manage with limited supplies, people have been forced to self-regulate their consumption of food and water, survive with whatever resources they are left with, or find suitable substitutes such as animal food or edible plants (that at some point also became sellable goods due to lack of other food products). The mass erasure of material conditions of living and the “metabolic” flow of goods to the besieged region (Smith and Isleem 2017), which even before the recent escalations was one of the most aid-dependent in the world (Bhungalia 2015; Griffiths 2022; Othman 2024), has forced an entire population to devise and re-devise their daily practices, simply to survive in the entrapped spaces with a lack of shelter, food, and safety. This, we show, has led to a use of whatever materials and temporary solutions Gazans can find to avoid starvation, maintain a sense of normalcy, and stay alive amidst infrastructural devastation.

In this article, we attempt to discuss the role of various infrastructural practices adopted in Gaza, all of which aim to respond to catastrophic annihilation of daily routines, resource unavailability, and unsafe conditions caused by infrastructural elimination. Engaging particularly with the material and infrastructural formations of daily survival and existence (*wujud*), we aim to cultivate a more everyday centred understanding of how the Gazan population is forced to find ways to navigate the fundamental material disruption of their lives—to “flee the ghost of starvation”, as Ahmed Al Wuhidi, a Gazan living through the war aptly articulated

it (Wuhidi 2024). These practices—some reorienting the know-how adapted during the decades of siege, others being born out of wretchedness—highlight the circumstances creating them, thus importantly showing how an entrapped population has been forced to adapt to death-spaces of mass destruction, sheer survival and apocalyptic horror. To elaborate what we name as *fitful infrastructure*—the volatile infrastructural practices born out of the spaces of elimination—we ask what does it mean to live in a place of severe lack of materials and annihilation of mundane life-supporting infrastructural conditions?

We start the paper by briefly looking at the infrastructural politics in Gaza before the current escalation. The form of infrastructural violence—based on scarcity, dependence, and disruptions—that Israel has imposed on Gaza over the last 17 years is crucial to fully grasp how infrastructural elimination works today by inducing brutal and inhuman conditions through the *annihilation* of infrastructure. By so grasping the magnitude of the ongoing situation, we pave the way for a discussion in the second section on fitful infrastructure. In the second section, we move the focus from what infrastructure does to what its erasure disables and incapacitates. We focus particularly on the Gazans dwelling with the lack of basic life-supporting infrastructure, suggesting that we need to recentre the focus from the resilient and always-abled body to think the fragile ways of inventing fitful infrastructures as volatile existence-preserving infrastructures. By discussing the current works on geographies of settler colonialism and practices of resistance (Hughes 2020; Joronen and Griffiths 2022; Salamanca et al. 2012; Velednitsky et al. 2020), we suggest approaching practices of fitful infrastructure, without glorification, as irreducible yet deeply rooted to the incapacitating violence of infrastructural elimination. The third section shifts the focus on various fitful infrastructures that Gazans have developed to survive the incapacitating conditions of infrastructural annihilation. We elaborate some methodological and ethical challenges of doing research under conditions of extreme material and genocidal violence before looking at the construction of makeshift toilets for tents, practices attending to the shortages and unavailability of water, and the generation of electricity through makeshift bicycle-powered generators, wind-powered fans, and solar panels. We conclude by holding indeterminately ephemeral and volatile temporariness of fitful infrastructures as key for thinking of ways of dwelling with the catastrophic conditions of infrastructural annihilation.

## Infrastructural Politics in Gaza: From Scarcity to Elimination

The formation of Gaza as a regional enclave must be understood as an inseparable part of a decades-long Israeli settler colonial project (Agha et al. 2024; Ghan-tous 2024; Joudah 2020). The Gaza Strip has been under Israeli occupation and colonisation since 1967 (planned and prepared by Israel years earlier; see Pappé 2017), and after the suffocating blockade began in 2007 it has been heavily dependent on international aid while continuously targeted with small- and large-scale Israeli military operations. The roots go further as the great majority of Gazans are refugees of the 1948 Nakba (or their descendants), granted the right

to return to their homes located within internationally recognised borders of Israel by the UN already in 1948 (Resolution 194). In such conditions of prolonged forced displacement, refugeeness, incarceration, and continuous everyday violence, the remaking of mundane dwelling practices takes a crucial role in how the sense of belonging is built and maintained through the permanent temporariness and the waiting of the return (e.g. El Masri 2020). As life in Gaza has for almost two decades been constantly disrupted by daily electricity cuts, military operations, and various forms of infrastructural and material scarcity, many of the everyday practices have also become organised around the daily emergence of breaks, glitches, and disruptions (Salamanca 2011; see also Berlant 2016; Nasar 2023; Silver 2015).

Following the withdrawal of its settlers from Gaza in 2005, Israel started making Gaza entirely reliant on the flow of imports in a manner it could orchestrate. This happened by imposing a siege (partly with Egypt) with calculated restrictions on what goes in and out of Gaza (people, goods, money), but importantly also through the strategic destruction of Gazan infrastructure, including the bombing of the Gazan power plant, the flattening of settlements, and the destruction of industrial zones and agricultural fields. After Hamas won the elections in 2006, Israel imposed the ongoing blockade (in 2007) with walls, buffer zones, and maritime/aviation restrictions, that by limiting food production (fishing and agriculture), import of electricity and building materials, and the entry of various substances, ranging from fuel and oil to everyday household items and food products, established the conditions of *infrastructural scarcity* (Butt and Butt 2016). These policies have turned Gaza into a space of “regulated humanitarian collapse” (Salamanca 2011), that due to severe “metabolic rifts” (Smith and Isleem 2017) and continuous bombardment has been slowly pushed at the “verge of collapse” (Joronen 2023a). This manufacturing of scarcity, Ghantous (2024) argues, evolves from protracted strategies of confinement and “pressure cooking”, which by gradually worsening all aspects of life push the “wilful” transfer of Gazan population elsewhere—their elimination, in other words.

It is by keeping the incarcerated enclave at the edge of collapse that Israel has created the conditions for the current phase of *infrastructural elimination*. The current annihilatory phase, we argue, has created unseen intensities in materialising Israel’s settler colonial eliminatory drive, including the systematic destruction of homes through pulverisation of entire neighbourhoods and the deliberate targeting of hospitals and shelters, but importantly also the annihilation of life-supporting water treatment, electricity, and food chain infrastructure. The scale and pace of the ongoing infrastructural elimination, on top of a 17-year history of systematic scarcity, isolation, and slow violence, have now completely broken down and paralysed the matrix of everyday life in the Strip. Most of the pre-October 2023 everyday activities are no longer doable and with the lack of materials, resources, and basic infrastructure people have had no other option but to create alternatives with whatever remains available in the spaces in which they are entrapped (more on this in the third section below). Important to such forced survival is the vast know-how developed during the previous aggressions and invasion on how to adapt to infrastructural incapacitations—the cuts, the

shortages, the disruptions, the destruction, and more. The undoing of the everyday via infrastructural elimination has thus forced people to create alternative practices by either using pre-existing know-how in novel ways or inventing entirely new infrastructural practices.

What we consider a current *annihilatory phase* of infrastructural elimination is thus ultimately a shock event, which however must be understood as an intensification of Israel's long-existing, settler colonial eliminatory drive. As all our interviewees in Gaza emphasised, in various ways, they have "never experienced anything like this before". The comments further outline the transition from one intensity of settler colonial violence to another, focusing on forced displacement (rather than pushing "voluntary" leaving), brutality (rather than scarcity), and genocide (rather than slow violence) (see Ghantous 2024; Salamanca et al. 2024). Despite containing various regionally differentiated phases following waves of military violence, the annihilatory phase hence operates through what we call extreme *material incapacitation* of life. This highlights the nature of infrastructural elimination as a form of incapacitation, under which people remain fundamentally unable to continue acting and dwelling in formerly routinised and familiar ways. Here we thus have a disruptive event that is neither one of unleashing the reformative power of openness and abundant potentiality—the surprise, the unexpected, the uncontrollable, and so on (Simandan 2020; cf. Dekeyser et al. 2024)—nor opposite to the eliminatory logic widely discussed in the literature on settler colonialism (e.g. Braverman 2023; Englert 2022; Ghantous and Joronen 2022; Shalhoub-Kevorkian 2014; Velednitsky et al. 2020). It rather names a change of intensity, pace, and scale of elimination, forcing the matrix of the everyday, even the most basic mundane dwelling practices, such as satisfying the hungry and thirsty body, to become fundamentally reorganised and reinvented.

This incapacitation is thus a way of radically altering the horizon of impossibilities. It is prescriptive, yet in a sense that incapacitation does not foreclose potential altogether but rather changes the field of im/possibilities in which the material practices can start (re)forming themselves (see Amoore 2013; Griffiths and Joronen 2021). It works through the lack, and when weaponised as a modality of infrastructural elimination, creates conditions that significantly keep changing the everyday horizon of dwelling through the negative alteration of *material conditions* of living. Infrastructural elimination should be seen as a way of tying the possible to the erasure, and thus, as a way of making something im-possible: it takes away possibilities, like the possibility to use tap water, thus affecting the conditions of living through the absence of possibility. Under such deficiencies, the thirsty and hungry body needs to constantly reinvent the means to feed itself (and others); the un-homed body needs to find new ways to shelter itself (and others); while the complete loss of familiarity forces even the most diminutive mundane practices to become inoperative and reoriented.

Infrastructural elimination gets its most brutal form in besieged death-spaces, such as the Gaza Strip. The incarcerated, now entrapped in multiple and constantly changing spaces, have no other choice than to keep reinventing dwelling, simply to survive the brutal elimination of life and the conditions that support it. And yet, their actions are not reducible to what has been taken away from them:

infrastructure. What rather remains crucial here, we show next, is to see Gazan survival through what we call *fitful infrastructure*.

## Thinking with Eliminary Violence: Fitful Infrastructure

As the discussion above shows, the targeting of infrastructure has, in various forms, been one of the key settler colonial techniques of Israel to create the deteriorating conditions in Gaza. Named as “Dahiya doctrine” after the massive destruction of civilian spaces in the neighbourhood of Dahiya in Beirut in 2006, the disproportionate bombing of civilian infrastructure, accompanied with the logic of holding “no civilian innocent”, has been used as a deliberate military tactic, as repeatedly articulated by Israeli leaders and military personnel since 2008 (Goursaud 2024; Khalek 2014; Khalidi 2020; UN 2023). At the same time, the deliberate destruction of infrastructure has worked along with the use of various other techniques. The biopolitics of humanitarian violence, for instance, with perfidious forms of masqueraded care orchestrated to keep Gaza at the verge of collapse, has worked hand-in-hand with the death-calculating thanatopolitics, ultimately rendering the Gazan population what Mbembe (2003:40) calls a “living dead” (see also Joronen 2016; Perugini and Gordon 2017). Importantly, these malicious techniques have affected the daily lives of Gazans to various degrees through what Salamanca (2011:35) sees as central to infrastructural violence: “the violent abuse and misuse of an interconnected set of socio-technical systems” that *sustain* life in contemporary societies. Indeed, gasoline and electricity can be as important as water and food, as the shutdown of Gaza’s hospitals, sewage treatment, and water pumps reminds us.

The control of life and death in Gaza has hence operated through the control of crucial live-sustaining infrastructures. This further highlights the significance of infrastructure in creating those “connections and disconnections among places and people” (Salamanca 2016:65) that redefine spatial relations in material, economic, and political, but also biological and environmental terms (see also Graham 2011). Infrastructural control becomes more pivotal in colonised settings with marginalised, racialised, and securitised subaltern populations systematically targeted, excluded, and dispossessed in myriad but systematic ways (see Salamanca and Silver 2022; Shalhoub-Kevorkian 2015). Israeli modes of targeting, limiting, and controlling Gazan infrastructure (Weizman 2011), including the destructive intensifications of “urbicide” (Abujidi 2014), “domicide” (Ram and Handel 2024), and “spaciocide” (Huss and Altehe 2024), are hence the colonial lifeline for exercising and maintaining power over Gaza in ways that ultimately affect even the minutest detail of daily life.

However, as Kurtiç and Nucho (2022:968) suggest, infrastructural politics should not only be seen as a practice of “elite control”, deployed and mobilised “to oppress, or govern”, but rather as an infrastructure “from below”: a human and nonhuman way of forging “collective lives” while reshaping the “material conditions of production and circulation”. Such a view resonates with what Simone (2004:410–411) called decades ago “people as infrastructure”, that is,

the informal, dynamic, and adaptable processes of interaction between people, infrastructure, and material objects that seek to “derive maximum outcomes from a minimum set of elements” (see also Simone 2018). Today, there also exists an abundant body of literature that draws on the notion “body as infrastructure” (e.g. Andueza et al. 2021; Fredericks 2021; Truelove and Ruszczyk 2022). Lesutis and Kaika (2024), for instance, explore capitalist exploitation and ways in which bodily labour is *infrastructured* beyond its control, thus showing how bodies become an expendable element in a larger system aiming at generation and appropriation of surplus value. They further contend that “the violence of these systems continues to infrastructure specifically racialised, gendered, and classed bodies for the ends of racial, colonial, patriarchal capitalism” (Lesutis and Kaika 2024:12). Indeed, in settler colonial contexts, like Israel–Palestine, infrastructure operates as a process of domination that not only legitimises colonial violence but also eliminates indigenous infrastructure (Barakat 2017; Pasternak and Dafnos 2018; Spice 2018). Bodies might escape such violence, but as infrastructured they nevertheless remain exposed to various settler colonial, racial, patriarchal, and capitalist logics of power.

While the works on “infrastructured bodies” and “people as infrastructure” eloquently speak to various topics, for instance how Palestinian workers labour in the settlements, they fall short in fully grasping what takes place in Gaza amid the ongoing phase of infrastructural elimination. Gazans are exposed to infrastructural elimination, in as much as they are improvising infrastructural practices out of the minimal set of elements. Yet with a view to “fitful infrastructure”, we do not aim to refer to what infrastructures are able to do, but what their elimination *disables*. Similarly, we are not only looking at the fitful infrastructure to celebrate the creativity of ad hoc infrastructural improvisations, making miracles out of the little left for always resourceful sovereign subjects (see Athanasiou 2016). Rather, with fitful infrastructure, we aim to think the way bodies, that are exposed to incapacitations of infrastructural elimination, contain an ungovernable excess that remains always irreducible to the infrastructural violence it is vulnerable and subject to.

The notion of fitful infrastructure, we hence argue, contains three key aspects. First, while acknowledging the importance of analysing the material aspects of deleterious Israeli power structures (Braverman 2023; Hughes et al. 2022; Joronen 2023b) and their colonial history (Svirsky and Ben-Arie 2019; Zureik 2016)—importantly also the ways in which the settler colonial logic(s) of elimination have led to the current genocidal situation in Gaza (Agha et al. 2024; Ghan-tous 2024; Salamanca et al. 2024)—we want to turn the focus on Gazan bodies and practices of surviving the incarcerated spaces of extreme violence. There is a substantial body of literature in geography examining how bodies resist deleterious and oppressive (infrastructural) conditions, also those in settler societies (LaDuke and Cowen 2020; Pasternak et al. 2023). Ranging from refusal to encounter (Abourahme 2025; Dekeyser and Jellis 2021; Griffiths and Joronen 2023) and trauma to emergent resistance (Hughes 2020; Marshall 2014), these works underline how targets of power are never reducible to mere victims and passive objects of violence. However, rather than viewing fitful infrastructures simply as a form of bodily resistance, we propose considering them as a means of

forced survival, thus emphasising their irreducibility to infrastructural elimination. Indeed, bodies remain always irreducible to power, which is shown in the profound ungovernability of life against the aims to dictate, orchestrate, and dominate/eliminate it (Joronen and Griffiths 2022). It is this *irreducibility* that we want to take up as an approach for thinking the infrastructural elimination through practices of fitful infrastructure.

Secondly, and relatedly, in doing so it is utterly critical not to force Palestinian life to simplified frames that lay Gazan agency beforehand as always empowered and capable of creating “heroic” and “omnipotent” modes of resisting subjectivity (Dader et al. 2024; Harker 2011; Järvi 2024; Shwaikh 2023). Painting rosy pictures of heroic resilient abilities of people living through the horrors of mass termination and sheer survival can be as much dehumanising as misleading, while simultaneously turning attention away from the urgent need to call for ceasefire and the liberatory politics of ending the settler colonial elimination of Gaza. Here we are thus more aware of the dangers of simply underlining “the ways people counter ... control” and “the power of the sovereign” (Griffiths 2022:1644, 1646), or how the “maintenance and repair” of “infrastructure out of order” can function as “a vital source of variation, improvisation and innovation” (Graham and Thrift 2007:6). In addition to the fact that the ideas of innovation, maintenance, resilience, and repair “might reproduce ... the problem that generated the need for them” (Berlant 2016:393–394), the situation in Gaza is far from the ideal disposition of “I can” (Ahmed 2006). The relentless struggle with completely collapsed infrastructure amid genocidal violence leaves little room for harnessing creative energies. This is not to deny the ingenuity and agency of those entrapped in spaces of infrastructural annihilation, but rather to see fitful infrastructures as volatile endeavours born out of them.

Accordingly, we approach the practices of fitful infrastructure as fragile constellations susceptible to short cycles as part of the efforts to live through the ongoing material politics of infrastructural erasure. There is an ephemeral temporariness that characterises the material practices of fitful infrastructure in their effort to grasp the little that is left to stay alive, not to starve, and to continue the everyday tasks related to cooking, caring, sheltering, and various other intimate practices. The ingenuity of the material practices and quotidian infrastructural alternatives that Gazan people have grasped to survive genocidal aggression is hence a result of desperate circumstances beyond their control. While this lack—the annihilation of infrastructure—is forced upon them, there is no guarantee of fitful solutions. By examining these human and nonhuman infrastructural practices, we wish to gain more insights to the alternative infrastructures that people lean on under extremely incapacitating conditions of violence and extermination.

Such material practices, we argue thirdly, have very little to do with the calls of “affirmative ethics” for positive action as underlined by many working with the affirmative strands of posthuman politics and new materialist thought (Braidotti 2019; Dawney and Jellis 2023; Dekeyser and Jellis 2021). They rather point out a rudimentary aim to simply stay alive and survive—to keep *existing*—amid the extreme incapacitation of life and the mass destruction of the conditions of

living. Indeed, a mere lack of electricity has disabled numerous mundane practices in Gaza and made everyday tasks formerly practised in households, schools, offices, universities, and public spaces impossible. Together with the severe limitations to food supplies, mobility, agriculture, fishing areas, humanitarian aid, and so on, such infrastructural incapacitation has rendered most of the previous mundane practices undoable. In such situations, people seek, not simply to affirm, but to “fill the void” (Knottnerus 2005:15), either by creating new practices or by mobilising the known tricks of living with disruptions and scarcities. This mirrors the negative force that according to Dekeyser and Jellis (2021:322) “urges the coming-to-terms-with, rather than the working-away of, a past or present that wounds, disturbs, mortifies, [and] destroys”. Such an approach doesn’t aim to unwrite the catastrophe in Gaza, but rather to look at what the induced negative conditions *do* and *undo*. Indeed, in response to various deleterious modes of infrastructural incapacitation, Gazans have for decades sought alternatives, such as the use of candles to replace lights in households, fuel-run generators (for those who can afford them), solar panels (also for those who can afford them), cooking oil for cars, aquaponic farming, and many more aiming to inoperationalise the conditions of the blockade (e.g. Gadzo 2017; Salamanca 2011).

In the following section, we aim to exemplify the current infrastructural elimination and the fitful infrastructural practices that have emerged since the start of the war on Gaza in October 2023. We are using mainly materials that we have archived since the beginning of the infrastructural elimination from various publicly available sources. Our choices here are not only related to the inaccessibility of the field, but also grow from wider considerations related to ethical challenges of working with people living through extreme conditions of violence. To respect catastrophic realities and the emotional well-being of those experiencing and being traumatised by the current living conditions, we rely mostly on the materials available without our input: the online materials (videos, stories, pictures, comments, elaborations) that are voluntarily shared by Gazans on social media, and the materials and stories widely circulated through various media outlets. The majority of the sources we use are in Arabic, some in English. By analysing already shared materials, we intentionally avoid subjecting Gazans to potentially triggering questions and invasive inquiries, and rely on what those subjected to violent elimination have themselves felt possible to share with wider audiences. We have tried to pay attention to various backgrounds and locations as much as they have been evident in the materials, relying also on the knowledge of the first author on the region he is originally from. In addition, we have used our networks in Gaza to further interview (via theme interviews) a smaller group of people (nine interviews) on key aspects of the article. This practice has ensured a more delicate approach to the situation that people in Gaza were in during the time of material collection. Finally, as our focus remains on material practices, we have been keen to know how fitful infrastructures work and through what conditions they emerge, instead of explicating how they have been experienced. To speak of the unspeakably inhuman conditions (Salamanca et al. 2024) is to speak through the infrastructure—its elimination and fitful reinvention.

## Fitful Infrastructure in Spaces of Erasure

As temporary places of dwelling, tents systematically lack basic amenities such as toilets, kitchens, running water, and electricity. Often quickly assembled from available materials, tents are also constantly exposed to the elements. As the materials we collected highlight, the wind sweeps through tents, bringing with it debris and contaminated dust, which infiltrate the inside even through the smallest cracks. When it rains, the ground quickly turns muddy, which makes living conditions even more unbearable. It does not ease during the summer, when the heat of the day reaches its peak, rendering the tent an unliveable oven. At night, people struggle to find their way in and through the complete darkness, with the obnoxious knowledge that the only protection from the bombshells, the shrapnel, and the always unpredictable magnitude of Israeli violence is the thin fabric of a tent. As one Gazan resident elaborated after a stormy night:

Last night, my family and I slept in a tent near the sea. The surrounding tents were collapsing, and inside ours, we watched the roof sway, fearing it would fall. I stayed close to the central pole to prevent it from toppling onto my mother and sister. My father moved around, trying to seal gaps to keep out the cold wind. My brother left to assist a neighbor with their tent, while my younger brother held onto a tarp to block the wind, but it tore. We wished for rain to calm the wind but realized that without the nylon covers, we were drenched. (@dn\_osama, 2025)<sup>i</sup>

Under these conditions, the question that needs to be posed is how people manage to dwell in spaces where infrastructure is not only severed, disabled, or completely eliminated, but also where humanitarian aid is insufficient or deliberately obstructed? Basic daily needs, like eating and cooking, along with drinking, sleeping, breathing, or answering the call of nature, are what *nobody* can live without, regardless of the circumstances. Living in areas where infrastructure is severely lacking, making even the simplest daily tasks nearly impossible, Gazans are forced to improvise and invent in order to survive and meet their basic needs. Water, for instance, becomes a daily struggle: in the absence of pipelines and destroyed plumbing, families rely on what they can carry by hand after hours of queuing. Water arrives in jugs, sometimes scavenged from nearby sources that may or may not be clean, while in other instances desalinated from the sea. To grasp what we mean by “fitful infrastructures”, we thus need to ask what does it mean to survive in such conditions of scarcity, not for days or weeks, but month after month, when aid is prevented or out of reach and when the end of violence is not in sight?

The above has been the reality for close to 1.5 million people in Gaza since October 2023 (UNRWA 2024), as the Israeli air strikes and ground invasions continued, for 15 months, to tear down cities while forcing civilian populations to ever new zones of (un)safety. The gap between what was once manageable daily life with scarcities, disruptions, and limitations, and what is now daily existence is vast, highlighting the grave gap between infrastructural scarcity and infrastructural elimination. As people are forced to survive, they try to find ways to fill the gaps left by shattered infrastructure. They navigate through and find ways to infrastructure the tent, the bombed house, the vicinity of a hospital, a school,

and in many instances, the streets. Amid such a landscape of erasure, makeshift latrines are being dug in the ground, ovens made in the most imaginative ways, or mobile toilets created and sold to the people. Small kitchens are improvised within tents, lights are secured in unconventional ways—people continue to dwell with the catastrophe.

Numerous videos, pictures, stories, and testimonies shared by Gazans through various personal networks and media channels highlight the severe hardships of living under conditions of infrastructural elimination, along with the efforts to overcome them. With the rising number of displaced people, the number of public bathrooms, when available, has not been enough and people have been queuing on a daily basis for what is neither clean enough nor providing proper privacy (see also ECHO 2024). To counter the conditions, a young adult from the middle area of Gaza explained in an interview how he started creating wooden mobile toilets and travelling a dangerous journey to Rafah to sell them to people dwelling in tents. He explained how he came up with the idea of portable toilets when he “went among the tents and saw the people’s suffering” while realising that “they could not use the toilet[s]”, further emphasising the difficulty of filling the basic human needs in the “camp cities” of southern Gaza. He added, “I filled my time with it, as there was nothing else to do, and I started making toilets in Nuseirat, middle area, and I would go and sell them to people in Rafah”. Similarly, a plumbing store owner facing the lack of materials was compelled to make wooden portable toilets and sell them to people, stating that “I started selling them to people. I benefit and they benefit in such a situation”.

The harsh realities of the camp cities of southern Gaza are evident in the simplest acts. One tent resident, describing their efforts to create a functional living space, stated, “today, we’re in a struggle for survival ... I found a wooden board to make a kitchen to my tent, so I can put there the few plates and cups that I have”. The testimony encapsulates the importance of even the most diminutive micro-practices, not only in finding alternative solutions to fill basic needs in the tent cities, but in creating some sense of routine and home. Another tent resident posted a video of himself building a toilet, explaining that “we moved to a new tent, so we have to build a new toilet”, which he dug into the ground by using an old metal chair with plastic plates to create the latrine. The variety of methods people are using to develop and implement fitful infrastructure highlights the scarcity of materials, but importantly also reveals the varying impacts of infrastructural elimination and the changing degrees of incapacitation across the Gaza Strip. These differences resonate with what Silver (2014) has described as inventive infrastructural practices from below, which, in response to impoverished circumstances, are characterised by improvisation, temporariness, and a lack of guaranteed longevity and/or success. However, and important in understanding the “fitful” aspect of these infrastructure, there is a very thin possibility for what Silver further calls “incremental makeshift infrastructure”. Mobile toilets, small wooden kitchens, and tent latrines rarely become incrementally evolving infrastructural improvisations under volatile conditions characterised by constant evacuations, bombings, and persisting infrastructural elimination. They are instead

ephemeral and volatile, devised to meet a *lack* in a situation that is ongoing and susceptible to swift changes.

This also applies to various aims to generate and find alternative electricity sources amid the infrastructural erasure. Before 7 October 2023, the Gazan electricity grid had significant daily shortages ranging between 11 and 14 hours per day on five-year average (the situation was even worse during the earlier five-year period; see OCHA 2024b). Prior to October 2023, many Gazans relied on localised sources of electricity using UPS systems that combined car batteries and inverters, most often with solar panels. Diesel generators were also in use, though unlike UPS and solar panels, which were more suitable options for the households, generators were more optimal for big companies that needed a more steady flow of electricity. Crucially, however, none of the options were enough to provide full electricity coverage. UPS and solar panel options were also costly, and thus something most households or small businesses could not afford. However, after the infrastructural elimination started, the electricity grid outage became permanent. The shortage severed the availability of essential services related particularly to health, sanitation, and water availability. Due to a total blackout, an increasing share of the population tried to resort to solar panels, though the majority of the solar panel infrastructure had been destroyed in massive bombings. This forced people to find less technology-intensive ways to generate power, such as small-scale makeshift windmills and the use of movement of the body to create enough kinetic energy, for instance, to charge cell phones (an essential communication device during the conditions of war).

One alternative method for generating electricity involved the use of stationary bicycles. This crisis- and scarcity-born idea goes back to a Gazan tailor who in the absence of electricity used his son's bike to power his sewing machine. With the bike turned upside down and connected to the sewing machine's handwheel with a bike chain (Figure 1), kinetic energy could be used to operate the machine. In some instances, the bike chain had been connected to a basic dynamo further wired to batteries. The idea has inspired others to use kinetic energy for different purposes, such as lighting houses, tents, and shelters with LED lights, charging small devices such as phones, or getting the small ground-water pumps working. Since a great deal of kinetic energy is needed, people have taken turns in pedalling. Indeed, fitful infrastructures often become collaborative efforts to utilise whatever materials are available. Importantly, although these practices can become shared and imitated, they seldom provide incremental ways of building infrastructures "along the way". Instead, they are localised, small-scale adaptations to the changing conditions of ongoing infrastructural erasure, designed to meet short-term needs.

Other communal practices include setting up makeshift charging centres for cell phones. To address the blackout, available solar panels with batteries have been turned into charging stations. Compared with the use of solar panels prior to October 2023, this practice offers a crucial method for distributing the limited available electricity to the community. Although unreliable and designed for the conditions of erasure, such stations are crucial for keeping key communication devices operational, enabling access to key information, contacting family



**Figure 1:** Distributing water and using alternative electricity production methods in Gaza (image on left ©Mohammad Abu Tawela; reproduced by permission / image on right ©Anadolu Ajansi; reproduced by permission)

members, and connecting to the internet (when available). To achieve the goal, an inventive method of electricity production emerged in the makeshift tent camps of Rafah, in southern Gaza, where a 15-year-old boy, driven by his passion for and knowledge of physics, used basic tools to harness wind energy. He recounted his experience:

The displaced people inside the camp nicknamed me “Gaza’s Newton”, appreciating my role in lighting it up. After 20 days of our displacement to Rafah and the electricity being cut off, with no available source of energy to illuminate the tents, I thought of creating a windmill to illuminate the darkness of the camp. I brought a fan and installed it to convert the kinetic energy from the wind force into electrical energy. (Abushamala 2024)

Interestingly, this further highlights the limited scope and irregularity of the fitful infrastructures: until more supplies and batteries are available, the light comes only intermittently.

Although highlighting the ingenuity of young individuals in catastrophic environments, this infrastructural practice also speaks to broader ways of dwelling in spaces of infrastructural elimination. The practice only partially meets a small, specific need, and importantly has been already made impossible in Rafah, which unlike in February 2024 when the interview was made, has been turned into a ruined ghost city. People have been displaced again by carrying only the essential, if nothing. Despite the know-how of making such improvised infrastructures, these infrastructures thus remain fitful to a situation, including prevailing needs, weather conditions, and materials available in the vicinity. Indeed, the

temporariness and fragility of these ephemeral practices was aptly articulated in the statement of a person who, by referring to makeshift toilets, said: “as we moved to a new tent, we had to build a new toilet”.

One of the most severely damaged infrastructures in Gaza has been the water infrastructure. After Israel purposefully cut off water imported by the Israeli water company Mekorot, significantly damaged or destroyed the water facilities and pipe infrastructure, restricted the entry of spare parts and fuel needed for water infrastructure repair, hampered the delivery of humanitarian water aid, destroyed local wells and water storage facilities, and caused contamination of Gazan ground-water sources, daily water availability in Gaza has dropped by 94% from the previous, already scarce level. This drop has meant a daily average of 4.74 litres per person, which is far from the 50–100 litres per day recommended by WHO for proper daily drinking, washing, food preparation, and personal hygiene consumption. It is important to note that the average availability of water also varies significantly in relation to the phase of the war and region in Gaza (Oxfam 2024; see also Hall et al. 2024; Municipality of Gaza 2024). According to a report published in July 2024 (Oxfam 2024), Gaza City, for instance, lost nearly all its water production capacity, while 88% of its water wells and 100% of its desalination plants were damaged or destroyed (UN News 2024). Deliberate hampering of accessibility to water and food was also one of the key entry points in South Africa’s argument against Israel on genocide in the International Court of Justice (ICJ). This was the case already in January 2024 (Al Jazeera 2024a; The Guardian 2023), after which continuous Israeli attacks have only made the situation worse (see BBC 2024; The National 2024).

The ongoing circumstances in Gaza have made meeting daily water needs an exceptionally strenuous endeavour. Water acquisition has become a perilous and labour-intensive task, forcing families to navigate long distances under dangerous, volatile, and insecure conditions, simply to guarantee their daily need for drinking and cooking water. “Before the war”, one of our interviewees described, “water trucks used to roam the streets, selling water to fill your barrels or containers. But during the war, things changed”. Indeed, Gaza has witnessed various improvised and fitful attempts to secure water availability, including the use of pushcarts, animal-driven water carts, even child labour, with children hauling small containers and jugs, and walking long distances. Families are often forced to queue for hours at makeshift water stations to obtain their daily quota, distributing the task among the family members (Figure 1). As one of our interviewees explained, “I would go to the bakery, my second brother would go for sweet water, and the third brother for salty water”. Another interviewee added, “at times, we were forced to drink salty water”. Under such conditions, many have tried to invent handmade water purification systems. Ahmed, for instance, tried to develop a water filtration system by piling up stones, sand, cotton, and charcoal inside a plastic bottle to turn the water into (hopefully) drinkable quality (for a video, see Al Jazeera [2024b]). Such practices show, again, how deeply incapacitating the conditions in Gaza are: it was people’s hopeless resorting to the undrinkable sea water that according to Ahmed pushed him to build the filtration system.

These unsystematic and insufficient measures do not, and cannot, replace a functioning water distribution network, and as such illustrate the far-reaching impact of infrastructural elimination. Even if there is water in the wells, the lack of electricity makes it difficult to obtain and, as one interviewee explained, often undrinkable: “without electricity to filter it, the salt percentage in the water was very high”. Furthermore, the physical and emotional toll of such acts is significant, as families are forced to spend entire days searching for minimal supplies. One interviewee explained, “on our area, Sheikh Radwan in the north of the Strip, there was only one working water station. Of course, there were huge crowds of people, and we had to wait for hours. After all the waiting, all you could get was one gallon of water”. Makeshift desalination stations and temporary relief through sporadic international aid, are insufficient due to extreme growth of demand, leading to several hours of waiting and limited quotas. The reliance on unsafe sources, paired with limited access to clean water, only exacerbates the challenges facing the people of Gaza. Yet, these practices highlight how infrastructural elimination needs to be understood through the grave incapacities it engineers, while simultaneously placing the realities of Gazan life at the forefront of thinking material strategies of dwelling and existing.

## Conclusions

In this article, we have elaborated on the fragile ways in which Gazans live in spaces of extreme incapacitation, paying particular attention to how Israel’s repeated and deliberate destruction of infrastructure, engineering of scarcity, and displacements have forced people to invent improvised ways of building shelters and securing food and water availability. We have explored these practices through the notion of “fitful infrastructure”—the fragile and volatile constellations prone to short cycles of success and failure in the struggle to safeguard material practices against what we elaborated as “infrastructural elimination”. These practices might not be able to overwrite the catastrophic conditions of settler colonial elimination in Gaza; yet they grapple with the consequences of infrastructural erasure. To meet immediate needs with available means, these infrastructural practices remain indeterminately volatile and profoundly born out of the rubble: due to changing spatial patterns of destruction and displacement, entrapping people to changing enclaves, the circumstances of their creation are marked by rapid changes that keep outpacing efforts to establish stability.

Fitful infrastructures can therefore only be understood in relation to a lack, and in the case of Gaza, offer a way of thinking about the middle ground between eliminatory infrastructural violence and irreducibility to it. The notion of fitful infrastructure centres on the reality of the bombed (Salamanca et al. 2024), instead of the logics of bombing (El-Shewy et al. 2025; Perugini and Gordon 2017), and thus focuses on material practices of dwelling with ongoing infrastructural elimination. Yet, it does so without framing heroic, resilient, and/or ingenious subjects, always able to creatively grasp the vibrant possibilities. Herein we have moved the focus from the resilient flexibility of ingenious life—always able to bend a bit more—to what could be perhaps framed as a “plasticity” of

life—to a life that also has a breaking point. Such a take on life, at the same time vulnerable *and* irreducible to the ways of erasing infrastructures that support it, can help in rethinking the current work around “resistance” (Hughes 2020), “refusal” (Bhungalia 2020), “steadfastness” (*sumud*) (Alqaisiya 2024), and “ungovernability” (Joronen and Griffiths 2022; Marei et al. 2018) beyond problematic notions of glorified heroism (Dawney and Jellis 2023; Harker 2011; Järvi 2024) and passive victimisation (Hammami 2015). Especially in the context of Palestine, such a view can open insightful avenues for rethinking the scope of *sumud* (steadfastness) of Palestinian people against the extreme forms of Israeli genocidal violence and deliberate settler colonial elimination of life-supporting infrastructures.

It is by centring everyday vulnerabilities of dwelling with the catastrophic conditions of infrastructural erasure that we have looked at the eliminatory practices from below, through fitful infrastructures. Out of the myriad volatile infrastructural practices, we focused on three themes in particular—electricity, water, and tent infrastructure—to exemplify the daily struggles amid the ongoing mass annihilation of infrastructures and spaces of living. While this speaks crucially of the realities of living through brutal violence, it also speaks “less about making a particular place inhabitable than about enabling resident’s surroundings before returning to familiar places now rendered unfamiliar” (Simone 2018:5). By focusing on the infrastructural incapacitation and lack as a conditioning field of im-possibilities for those living through the infrastructural elimination, we have shown how such fitful infrastructures are intrinsically constituted out of the ephemeral ways of *dwelling with* the erasure and its incapacitating conditions.

What is at stake in infrastructural elimination is no less than the future of Gaza. The ongoing mass elimination of Gazan spaces and people speaks of the “future-cide” Ram and Handel (2024:2) use to describe the current “negation of the future of the colonized for the sake of ensuring a future for the settler society”, and which Amir (2021) has seen as a long-term “war on Palestinian futures”. Indeed, the current plans and visions articulated for Gaza in Israel (Ghanous 2024), and now by President Donald Trump, are chilling, speaking openly about forced displacement, ethnic cleansing, settler colonisation, and (real estate) profits. There is thus an urgent need to consider alternative Palestinian futures “from below” (Griffiths and Joronen 2023) as much as in “global frames” (El-Shewy et al. 2025)—“through ongoing cultivations” (Hassouna 2024) as much as through “plans of return” (Järvi 2024)—but importantly also with ways that advocate for progressive politics to end the settler colonial elimination of Gaza, and Palestine once and for all.

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## Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

## Endnote

<sup>i</sup> See <https://www.instagram.com/reel/DFs8q4yOS0l/?igsh=Y2lzdGVvNXlkdnP1> (last accessed 26 February 2025).

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