

The Links between Conflict and Hunger in Syria

Conflict, Hunger and Aid Access

April 2023



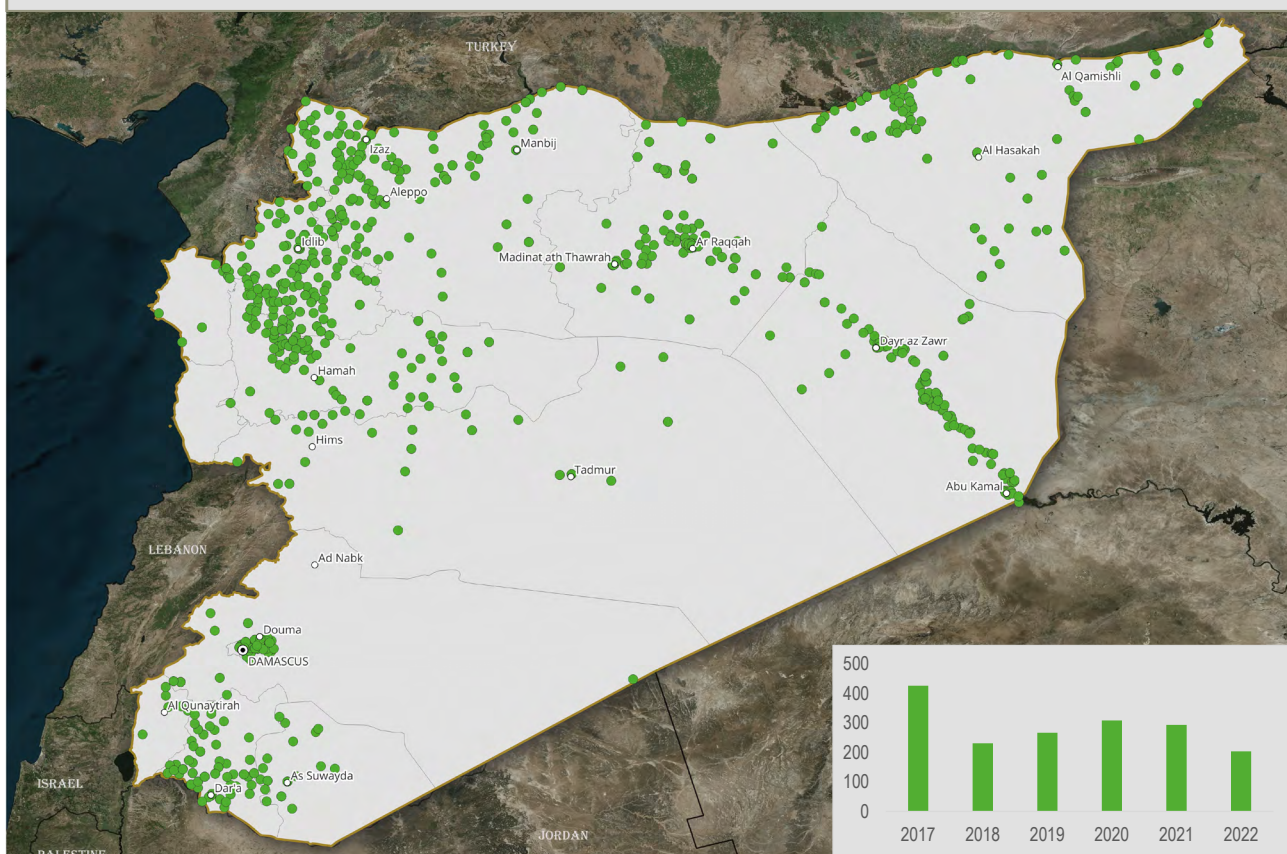
How Conflict Actions Contribute to Food Insecurity

This report forms part of a **series** exploring conflict events that directly undermine food security, with the aim of contributing to a better understanding of the connections between conflict and hunger. It highlights how attacks on crops and lands, farmers and agricultural workers, food supply chains, markets, and key infrastructure, and threats affecting humanitarian agencies directly contribute to food insecurity. The presented data highlights the need for further discussion of how such conflict-event data can be used by the humanitarian community to support programming that prevents hunger. The report is based on the Food Insecurity and Violent Conflict (FIVC)-Syria dataset, a unique event dataset of conflict events that affect food insecurity in Syria that was compiled from open sources and partner contributions. It covers the period from 1 January 2017 to 31 December 2022. The data is accessible on [HDX](#).

Introduction

Since the start of the Syrian civil war in 2011, the number of civilians experiencing food insecurity in the country has grown substantially. Syria is among the **six countries** with the lowest levels of food security worldwide. At the **end of 2022**, 12 million people were food insecure and 2.5 million were severely food insecure. Individuals in these categories comprised more than half of the entire Syrian population. The present report highlights a range of violent-conflict-related events that have contributed to the rise in food insecurity in Syria since 2017.

Figure 1: Conflict events affecting food insecurity in Syria, 2017-2022 (1,732 recorded incidents)



The key drivers of food insecurity in Syria have been both human and climate change induced. Syria suffered a significant **drought** between 2006 and 2010, while in 2020 and 2021 unprecedented levels of drought and rainfall scarcity were reported. As a result, the percentage of irrigated land in the country has almost **halved**.

The **UN** estimates that at least 50% of planted crops in Al-Hasakah governorate (Syria's main wheat-producing region) could die as a result of the drought. Crop yields are further jeopardised by the **declining flow of water** through the Euphrates river, which supplies irrigated lands with water.

The high dependency on the import of a number of commodities, aggravated by poor agricultural harvest seasons in the country, have left Syria susceptible to high global food prices. The World Food Programme reported that between 2020 and 2022 food prices in the country increased by **532%**. As a result, **90%** of the Syrian population are currently estimated to live in poverty. The Syrian economy has been further affected by the ongoing **war in Ukraine**, which has contributed to further driving up food and fuel prices.

In addition to climate complexities, food prices, and the ongoing internal conflict, the various humanitarian crises in Syria worsened in February 2023 as a consequence of the earthquake in north-west Syria and southern-central Turkey. Hostilities in the region of the earthquake have hampered the delivery of aid, which led to accusations that life-threatening aid was being **politicised** due to the ongoing conflict. Even before the earthquake hit, as of June 2021 only **15%** of aid requested by the United Nations (UN) for humanitarian assistance to Syria had been delivered, highlighting the assistance gap that could mitigate food insecurity.

The current report focuses on conflict events that have contributed to Syria's food insecurity, a condition that exists **when** "physical and economic access to sufficient, safe and nutritious food" to meet "dietary needs and food preferences for an active and healthy life" is absent.

The connections between conflict and food insecurity are complex. Moreover, detailed information is needed to support the effective implementation of the unanimously adopted UN Security Council **Resolution 2417** (2018), which acknowledged the links between violent conflict and food insecurity. However, as **two analysts note**, there are "fundamental data gaps" in the documentation and disentanglement of these links. Closing these gaps is "essential for producing effective food security" policies. This is especially the case in contexts where multiple compounding crises are occurring simultaneously, as is the case of Syria.

This report aims to help fill these knowledge deficits. It is part of a series of analytical reports focused on conflict and hunger analyses with a specific focus on identifying conflict actions that contribute to food insecurity.

Its analysis is based on a dataset of 1,732 individual conflict-related events reported in the period of the 1 January 2017 to the 31 December 2022.

Key Findings

Conflict has been an important contributor to Syria's declining food security. While the relationship between conflict and food insecurity is complex and highly dynamic, the analysis conducted here highlights multiple conflict-specific findings. Conflict parties must take the necessary precautions to protect civilians and civilian objects necessary for the production and distribution of food supplies.

Violent actions have degraded and destroyed significant portions of Syrian agricultural land and crops:

- Between 2017 and 2022 at least 699 conflict incidents occurred in which violent actions affected Syrian agricultural land and crops.
- The use of shelling, artillery fire, and air strikes during periods of hot and dry weather has started fires that pose a threat to farmers, crops, and the environment more broadly, in addition to deliberate arson targeting crops.
- Detonations of explosive weapons, including unexploded ordnance (UXO) and landmines, on agricultural land have contributed to the degradation of such land. This has foreseeable consequences for food production that will continue for many years.

Direct attacks targeting agricultural land and farm workers threaten agricultural outputs:

- The deliberate torching of farmland has been used as a tactic to target and control civilians and farmers by destroying livelihoods in local communities.
- Arson has also been used as a form of punishment of farmers who refuse to pay levies to armed groups.
- UXO and landmines continue to threaten, injure and kill farmers long after fighting has ended.
- Farmers and agricultural workers face risks from abductions, kidnappings, arrests and shootings, as well as from having their crops, agricultural equipment, and vehicles looted.

Water is being used as a weapon of war:

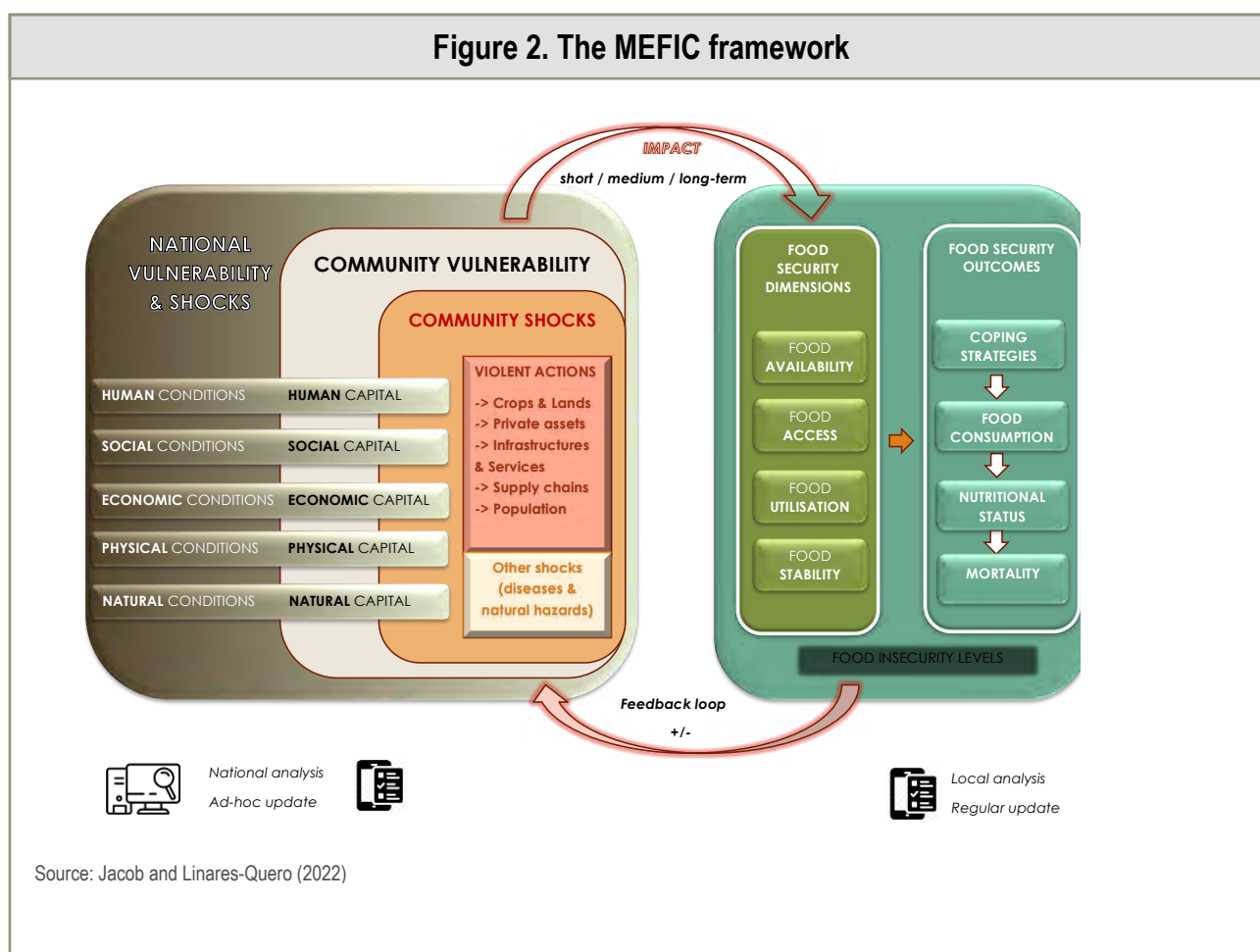
- The damaging and destruction of water infrastructure and facilities constitute a major humanitarian and health issue in Syria and have contributed to a shortage of water to irrigate Syrian crops and farmlands.

Food supply chains are being compromised by the conflict:

- The conflict has resulted in the destruction of significant numbers of Syrian bakeries, which has contributed to shortages of bread, which is a staple of the Syrian diet.
- At markets, people trying to buy food, food sellers and livestock have faced air and drone strikes and continue to be threatened by landmines, UXO and improvised explosive devices (IEDs).
- Attempts to respond to Syria's food insecurity with humanitarian food aid have been severely hindered by access restrictions and violent attacks on food distribution efforts.

Methodological Approach: the Food Insecurity and Violent Conflict (FIVC)-Syria dataset and the Monitoring and Evaluation of Food Insecurity in Conflict (MEFIC) Framework

The categorisation of events affecting food insecurity in the FIVC-Syria dataset is based on the MEFIC framework, an analytical model for understanding how violent conflict affects food insecurity. As part of this framework, violent actions targeting and/or affecting crops and lands, private assets, infrastructure and services, food supply chains, and populations are identified. This report focuses on these five categories. Further information regarding the MEFIC framework and FIVC approach is available [here](#).



Sources

The analysis presented in this report is based on the FIVC-Syria dataset containing 1,732 individual conflict-related events reported in Syria in the period 1 January 2017 to 31 December 2022. These individual conflict events are considered to have impacted on food security because they directly affected either the production or distribution of food in Syria. This dataset was compiled from four separate sources: (i) the Targeting of Infrastructure in the Middle East project¹ led by Prof. Jeannie Sowers (University of New Hampshire) and Prof. Erika Weinthal (Duke University); (ii) public data from the Armed Conflict Location & Event Data Project (ACLED)²; (iii) Insecurity Insight’s Security in Numbers Database (SiND)³; and (iv) the Airwars US Airstrikes in Syria Civilian Casualty dataset⁴. All four databases combine data using event monitoring from open sources as the main source of information. This combined dataset is here referred to as the FIVC-Syria dataset.

To analyse the data, the four datasets were combined and recoded to create a single dataset of conflict-related events that affected food insecurity in Syria in the period in question. Duplicates were removed.

Key Principles: Food Insecurity and International Humanitarian Law⁵

International humanitarian law (IHL) – the law that applies to armed conflict – does not make explicit reference to “food insecurity”. However, it does oblige conflict parties to follow behaviours and practices that reduce the risk of this materialising during armed conflict. The most important IHL principles are outlined below. As customary international law, they are binding on all conflict parties, whether states or armed opposition groups. Many of these principles are also referenced in the unanimously adopted UN Security Council **Resolution 2417** (2018), which acknowledges the “link” between “armed conflict” and “food insecurity”.

The prohibition of using starvation as a method of warfare

- Parties are **prohibited** from using “starvation as a method of warfare”. Pursuing this against civilians has the status of war crime under the **legislation of several states**, including the Russian Federation, Germany and Spain.

The protection of civilian objects that are indispensable to survival

- Objects that are “indispensable to the survival of the civilian population” are **protected** against attack, destruction or being rendered useless. These objects **include** “foodstuffs, agricultural areas for the production of foodstuffs, crops, livestock, drinking water installations and supplies, and irrigation works”.

Responsibility for meeting the basic needs of civilian populations

- Conflict parties with effective control over civilian populations have **primary responsibility** for ensuring that their basic needs such as the supply of adequate food and water are met.

Protection of humanitarian access

- When conflict parties are unable to provide sufficient food and water for populations under their effective control, humanitarian aid can play an important “**subsidiary**” role in responding to food insecurity.
- Under IHL, attacks on humanitarian actors are prohibited. Once relief operations are **authorised** by affected parties, “rapid and unimpeded passage of supplies, equipment and personnel involved in humanitarian relief operations” must be permitted. This includes the provision of food and water to civilian populations.

The principles of distinction, proportionality and precaution

- The underlying principle of distinction in IHL obligates conflict parties to differentiate between civilians (who are protected from attack) and combatants (who are legitimate targets). This is complemented by the principle of proportionality, which **prohibits** attacks expected to cause “incidental loss of civilian life” or “damage to civilian objects” that exceeds “the military advantage anticipated”. The principle of precaution means that conflict parties **must take measures** to minimise civilian harm.
- These principles help maintain civilian food supplies by protecting individuals involved in the production and distribution of food and the maintenance of key infrastructure such as water facilities and agricultural land used for civilian purposes.

To summarise, IHL has significant provisions serving to protect objects and actors that are crucial for preventing and responding to food insecurity.

Food Insecurity in Syria

Background to the Syrian conflict

The Syrian civil war started in March 2011 in Daraa governorate. Prior to the outbreak of civil war, Syria had one of the **most prosperous** agricultural sectors in the Middle East, particularly for wheat and barley. The pursuit of self-sufficiency and creation of huge wheat reserves had been a **strategic goal** of the governing Baath Party, with the aim of mitigating the potential impacts of Western-driven economic sanctions. This strategy led to the achievement of **self-sufficiency by 1994**, but came at a significant cost as soil and groundwater were degraded, a situation exacerbated by recurrent droughts and corruption, among other issues, during the early 2000s.

For several years in the run-up to the civil war, **economic policies** had focused on the service sector, which brought wealth to a minority, but limited overall economic growth in the country. When in 2008-2011 Syria suffered one of the most widespread and major droughts in its recorded history, the climate-induced agricultural crisis **triggered protests**. The drought, combined with inadequate water supplies, caused widespread crop failure and contributed to an increase in food prices. It also had wider social consequences, including the **internal displacement** of families and an increase in youth unemployment. The protests spread across the country and evolved into the conflict that is still ongoing today. Food production in Syria has continued declining since the onset of war. Before the civil war, Syria produced over 4 million tonnes of wheat per year. However, by September 2022 this number had **fallen** by 75% to 1 million tonnes. Consequently, Syria went from being food sufficient to needing to **import 40-50%** of domestic consumption needs.

The current report uses the MEFIC framework and FIVC-Syria dataset to focus on known military action that has fed into the significant decline in wheat production and the broader ongoing food insecurity crisis.

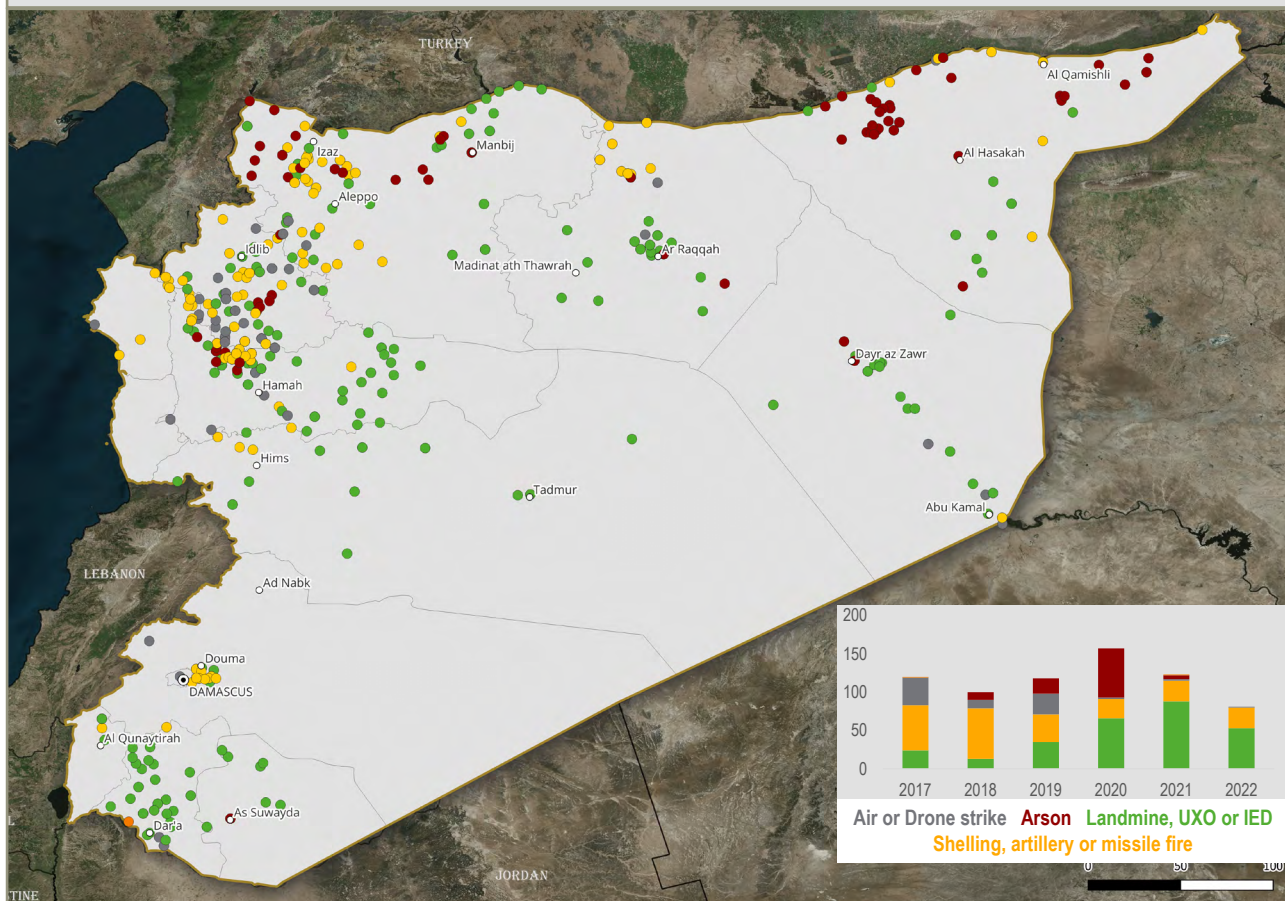
Attacks on crops and agricultural land

The war has had devastating consequences for the condition of Syrian agricultural land. This has been affected by at least 699 incidents of violent action between 2017 and 2022. Among these incidents, the detonation of landmines, UXO and IEDs was most frequent (40% of the total). A further third (34%) of incidents saw shelling, artillery or missile fire hitting agricultural land. The majority of the remaining incidents involved either arson (14% of the total) or air or drone strikes (11% of the total). However, the relative threat posed by these various means of violence has shifted over time. Shelling, artillery and missile fire, and air or drone strikes were most common for the period examined here between 2017 and 2019. Since this period, the threat posed by landmines, UXO and IEDs detonating has increased as unexploded weapons from air strikes and fighting have accumulated. This threat to agricultural land remains high.

Incidents were most commonly found in Hama governorate, which accounted for almost a third (28%) of the total numbers reported. Incidents were also commonly reported in Idlib (18% of the total) and Aleppo (15% of the total), one of Syria's **most fertile** regions for wheat production. The Syrian armed forces accounted for 34% of all incidents affecting agricultural land, making them the most frequently reported conflict party believed to be responsible for causing adverse effects to farmland. Almost 70% of incidents in which they were the conflict party involved shelling, artillery or missile fire, most frequently in Hama.

The violent actions reported here have tangible impacts on food production and food security beyond the direct physical threat they pose to rural populations. For example, in the summer of 2019 insecurity created by the conflict **led many farmers** in north-western Syria to harvest their crops before they reached maturity. This reduced productivity by 50% and caused related income decreases for farmers, thereby harming them and their families and contributing to general food shortages and increase in food prices.

Figure 3: Incidents in which agricultural land was affected by violent action, by means of attack, 2017-2022 (699 recorded incidents)



Shelling, artillery or missile fire

Syrian agricultural land was hit by shelling, artillery or missile fire at least 240 times between 2017 and 2022. Almost 75% of these incidents were recorded in the north-western governorates of Idlib, Hama and Aleppo, which border one another. Over 70% of these incidents occurred between 2017 and 2019 and almost a third (32%) caused crops on agricultural lands to be set on fire, the impact of which is discussed later in this report.

“Indiscriminate shelling has swept away the soil, making farmlands rocky and unfit for agriculture. The farmlands are filled with remnants of war. Perennial trees have been cut down after being hit by shrapnel that spoiled their fruit.”

(Syrian **farmer** from Idlib governorate speaking in May 2022)

Not only does shelling, artillery and missile fire itself destroy crops, but insecurity generated by these actions also prevents farmers from accessing their lands. This was the case in north-western Syria in the summer of 2019, when farmers were prevented from harvesting the crops they had planted. Subsequent crop losses for farmers in these areas were estimated to be **between 25% and 100%**.

Air strikes

A total of 79 air strikes hitting agricultural land were identified for the period 2017-2022. Almost 90% of these were attributed to Syrian and/or Russian military forces and more than 75% occurred in the north-western governorates of Hama and Idlib. Two air strikes were attributed respectively to the US-led international coalition and Turkish military forces. Over 90% of air strikes occurred between 2017 and 2019, with only one incident reported in 2022. However, their impacts are long term as indicated by the overall increase since 2019 in detonations of UXO on agricultural land: it is likely some of these items of UXO were first deposited by air strikes.

Air strikes affecting farmland have occurred in the context of broader conflict developments. Syrian and Russian air strikes have generally been carried out as part of their joint campaign against anti-government groups centred in Idlib governorate, but also opposition groups in Daraa, Quinaitra, Suweyda and Rural Damascus (Rif Dismashq). Syrian and Russian forces have also targeted the remnants of the Islamic State group, the actor against which air and drone strikes of the US-led international coalition have also been targeted. This coalition also targeted either pro-government, Iranian-backed militias or, in at least **one case**, Russian mercenaries from the Wagner Group (in February 2018). Meanwhile, Turkish strikes have tended to be in response to threats against Turkish troops on the ground or anticipated threats from Kurdish militants.

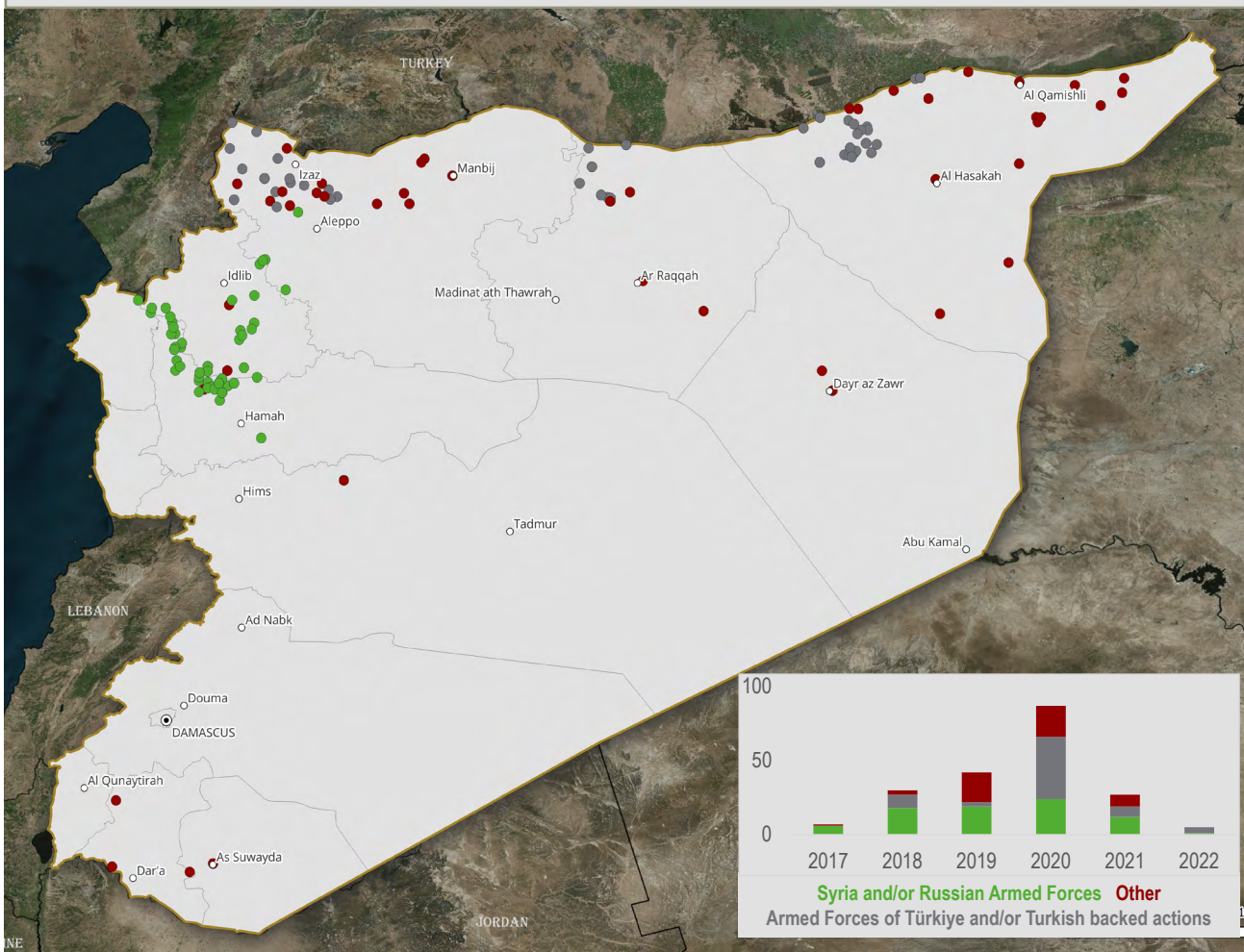
However, regardless of the different conflict actors and conflict developments, the use of air strikes has similar impacts in terms of destroying crops and reducing the ability of farmers to use land productively. As documented in following sections, the reasons for this include air strikes setting crops on fire and UXO accumulating on productive land.

Crop destruction by fire

Between 2017 and 2022 there were at least 198 incidents where crops or farmland was set on fire. The vast majority (91%) of all incidents were recorded in the summer months of May and June when Syria's key crop – wheat – is harvested. Incidents peaked in 2020, with over 40% of all cases recorded that year, while only five were reported in 2022. Arson accounted for 50% of these incidents across the 2017-2022 period, while slightly under 40% of fires were started by shelling, artillery or missile fire. Around 8% were the result of air or drone strikes, some of which used incendiary munitions. The conflict parties perpetrating these incidents varied across the country.

Syrian and/or Russian military forces were the most commonly reported conflict party responsible for starting fires: over 40% were attributed to their forces and most frequently occurred in Hama governorate. Turkish military forces perpetrated approximately a third of the incidents, most of which occurred during Operation Peace Spring in Al-Hasakah governorate, a region **described** as the breadbasket of Syria. Other conflict parties responsible for starting fires included Jordanian armed forces and the Islamic State group.

Figure 4: Recorded incidents where crops and agricultural land were set on fire, by conflict party, 2017-2022 (198 recorded incidents)



May 2021: Turkish-backed opposition rebels targeted wheat and barley farmlands in the Aleppo governorate countryside with incendiary bullets that caused fires.

July 2018: In Aleppo governorate, members of opposition factions belonging to the former Operation Olive Branch set fire to residents’ olive crops in multiple locations across Afrin district after the owners of the crops refused to pay royalties.

June 2020: Agricultural lands in the Idlib governorate countryside were set on fire by shelling from Syrian regime forces.

The war has also increased the likelihood of fires breaking out accidentally. The deployment of former farmers to fight in the armed conflict has reduced expertise on farms. As one farmer from Ar Raqqa **commented** in 2019, many of those “operating combine harvesters are new” to the sector, which in some cases has led to farmers not carrying water bottles to extinguish fires caused by dropped cigarettes. Equally, when fires do break out there are **fewer firefighting vehicles** to extinguish them because the war has reduced the capacity of governing authorities.

Although it is likely that in some cases crop fires were an unintended by-product of shelling, air strikes or inexperienced farmers, in many cases the destruction of crops and farmlands by fire was used as a conflict tactic to control and threaten populations. For example, in Jalma in Hama governorate in May 2018 regime forces and pro-regime militias set fire to crops after residents refused their demands to be paid in exchange for harvesting residents’ crops.

The Islamic State group has also been **accused** of pursuing a scorched earth policy of collective punishment involving the destruction of crops by fire to punish populations in areas from where the group retreated following its defeat.

The impacts of crop fires are wide ranging. In the first few weeks of June 2019 alone they were **reported** to have destroyed “more than 110,000 acres of crops in northeast Syria” and degraded a “third of agricultural land in northwest Syria”. Ultimately, such destruction undermines crop production and contributes to rising prices and the spread of increased food insecurity among civilians.

Presence of UXO, landmines and IEDs

A total of 279 reported ground-based explosions on agricultural land were identified across the 2017-2022 period. They were most commonly reported in the north-western governorates of Aleppo, Hama and Idlib, but were also frequently recorded in the southern governorate of Daraa. The explosions included UXO, landmines and IEDs; however, very often the reporting did not clearly distinguish among these categories.

Overall, there has been a noticeable rise in ground-based explosions on agricultural land in recent years, with the reported incidents increasing in number each year between 2018 and 2021. This follows a common pattern in the aftermath of highly intensive military action previously seen in other conflict zones such as **Laos** and **Cambodia**.

“I was clearing out dead weeds and starting to plough when a landmine exploded. ... I used to plough and cultivate the land, but now I’m no longer strong enough.”

Syrian **farmer** from Daraa governorate speaking in 2019 after losing his leg in a landmine explosion.

“We’re worried we’d be off to die with our sheep. ... We fear landmines.”

Sheep **herder** from the Rural Damascus countryside, 2021

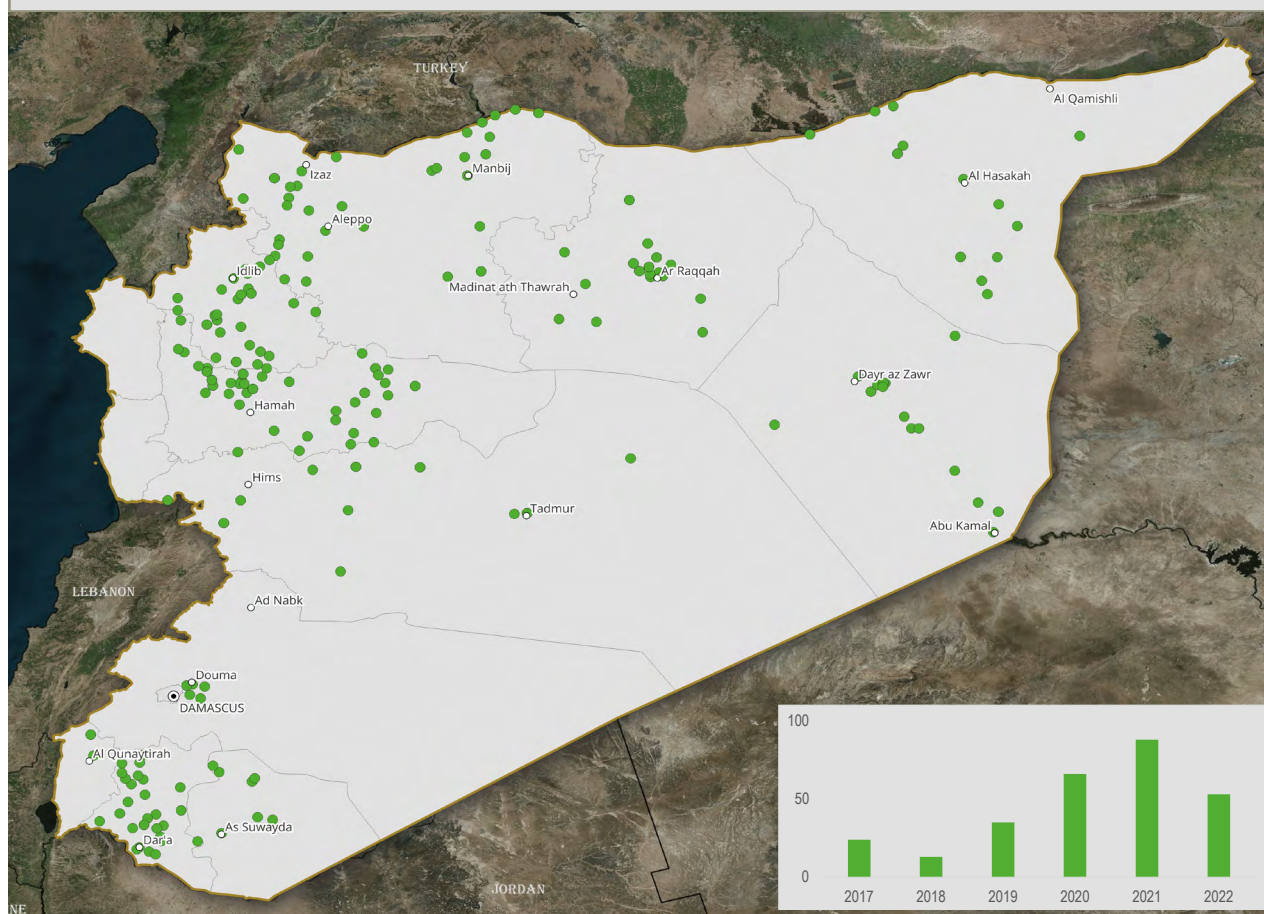
“The heavy elements that make up explosives are absorbed by the soil, and then transmitted to humans, and if the percentage of heavy metals exceeds the permissible limit, it may lead to cancer, and distortions are also transmitted to the animals, sheep and cattle, whose milk or meat humans feed on, besides the fear of killing farmers if [they] explode.”

Agricultural **engineer** in Idlib governorate commenting in 2022

Over 72% of the 279 recorded ground explosions on farmland caused physical harm to farmers and agricultural workers either by injuring or killing them. In several cases livestock were also affected. For example, in March 2021 a reported landmine planted by an unidentified armed group in Daraa governorate detonated, injuring a child herding sheep and killing 25 livestock.

Beyond their direct impacts, ground explosions create widespread fear that prevents farmland from being used for rearing livestock and growing crops. This in turn contributes to displacement. Indeed, in May 2022 it was **reported** that farmers had abandoned many farms in the Afrin region of Aleppo governorate because of the “dangers posed by thousands of undetected mines”. Furthermore, explosive weapons combined with damage to oil refineries (creating soil contamination, widespread pollution, and reliance on makeshift oil refineries that are more polluting) has had a significant **environmental impact**. This is likely to render Syrian agricultural land less fertile and, in turn, reduce productivity. The exact extent of this remains yet to be fully measured.

Figure 5: Detonations of landmines, UXO and IEDs on agricultural land in Syria, 2017-2022 (279 recorded incidents)



July 2020: Several grazing sheep were killed when a landmine planted by an unidentified armed group exploded in a neighbourhood in Afrin governorate.

February 2021: Two farm workers harvesting pistachios were killed and two others injured when a reported landmine planted by an armed group in the farmlands of Khan Shaykun in Idlib governorate exploded.

May 2021: A shepherd and his cattle were killed when a landmine planted by an unidentified armed group exploded in the Wadi-al-Azeeb area in Hama governorate.

December 2022: A piece of UXO went off while a farmer was picking olives near the Majdaliya axis in the Idlib governorate countryside, wounding him.

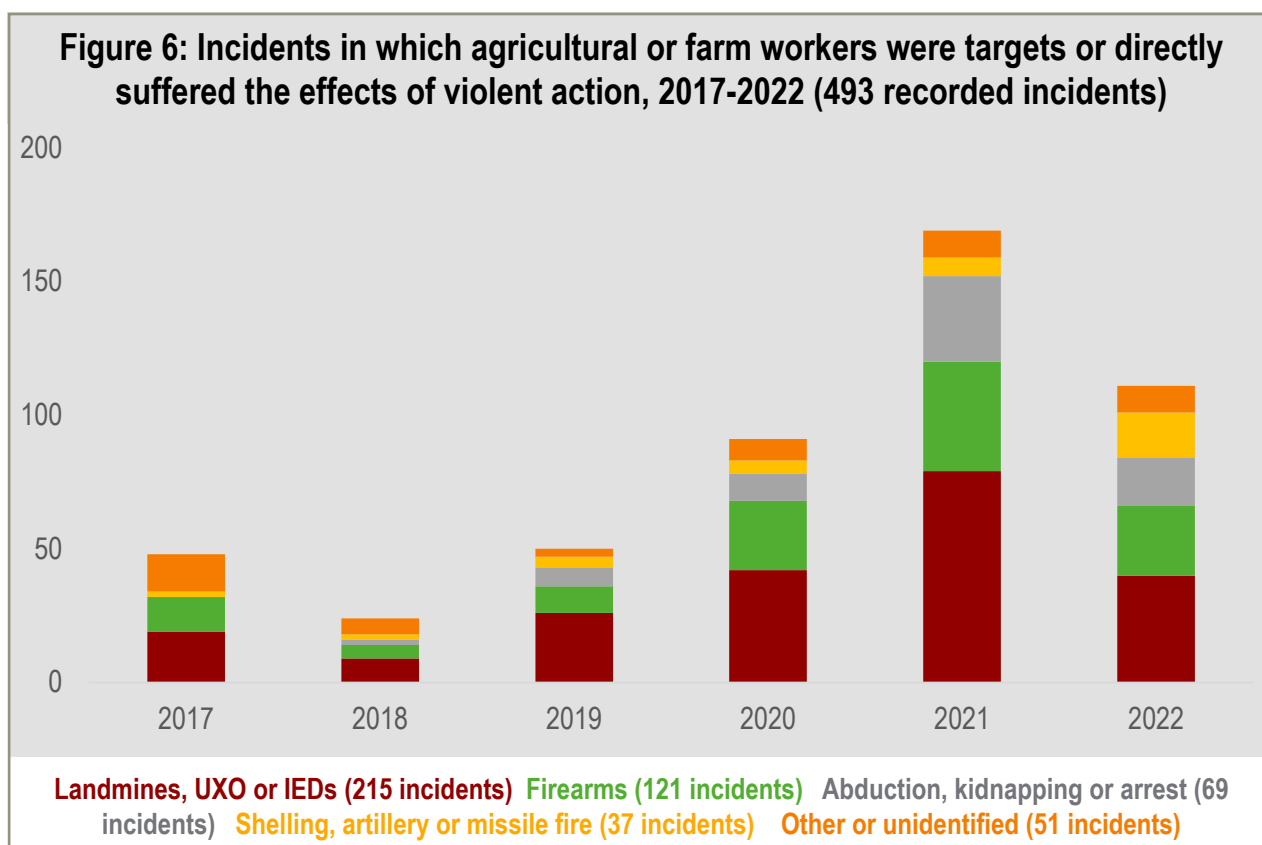
September 2021: A piece of UXO from previous regime shelling on the fields east of Saboura in Hama governorate detonated, killing a child while he was grazing sheep.

As noted, there is insufficient information to distinguish between the extent to which these explosions are caused either by state-manufactured landmines, directly placed IEDs, or other types of UXO left over from air strikes and shelling. However, the analysis for this report suggests that given the wide geographic spread of events relating to ground-based explosive devices compared to air strikes, many devices are likely to have been directly placed in these locations, in addition to UXO left over from previous air strikes. This indicates that targets may have included farmers working these lands. Even for devices that were not intentionally placed, both old and new types of munitions have a risk of failure, in terms of which the device is initially deployed, but does not detonate as intended and only explodes sometime later.

Consequently, even when explosives are used against military targets, they can have devastating effects on civilians and civilian infrastructure many years later if they detonate at the wrong time.

Violent Actions Against Rural Populations

During the period 2017-2022 at least 493 incidents occurred in which agricultural workers or farmers in Syria were the target or object of violent actions. Contrary to the overall trend for incidents in the FIVC-Syria dataset that showed a declining intensity of military actions, cases of violence that directly affected farmers and agricultural workers rose between 2017 and 2022. This was mainly driven by the detonation of landmines, UXO and IEDs that had accumulated gradually throughout the war and continued to injure and kill farmers. These incidents accounted for almost 45% of all incidents in which farmers and agricultural workers were the objects of violent actions and were most frequent in the north-western governorates of Idlib, Hama and Aleppo, and in Daraa in southern Syria.



An increase since 2019 in reported shootings of farmers and agricultural workers by firearms also contributed to the overall rise in incidents. There were at least 121 incidents in which farmers or agricultural workers were shot, accounting for 25% of the total reported violent actions against rural populations. They were perpetrated by a wide variety of armed actors, but were most often attributed to Syrian and Turkish armed forces. Geographically, they were spread widely across Syria, although were most commonly located in Aleppo, Daraa and Idlib governorates. Many farmers were shot while working in their fields and in some cases with their livestock. The exact motivations for the shootings were often unclear.

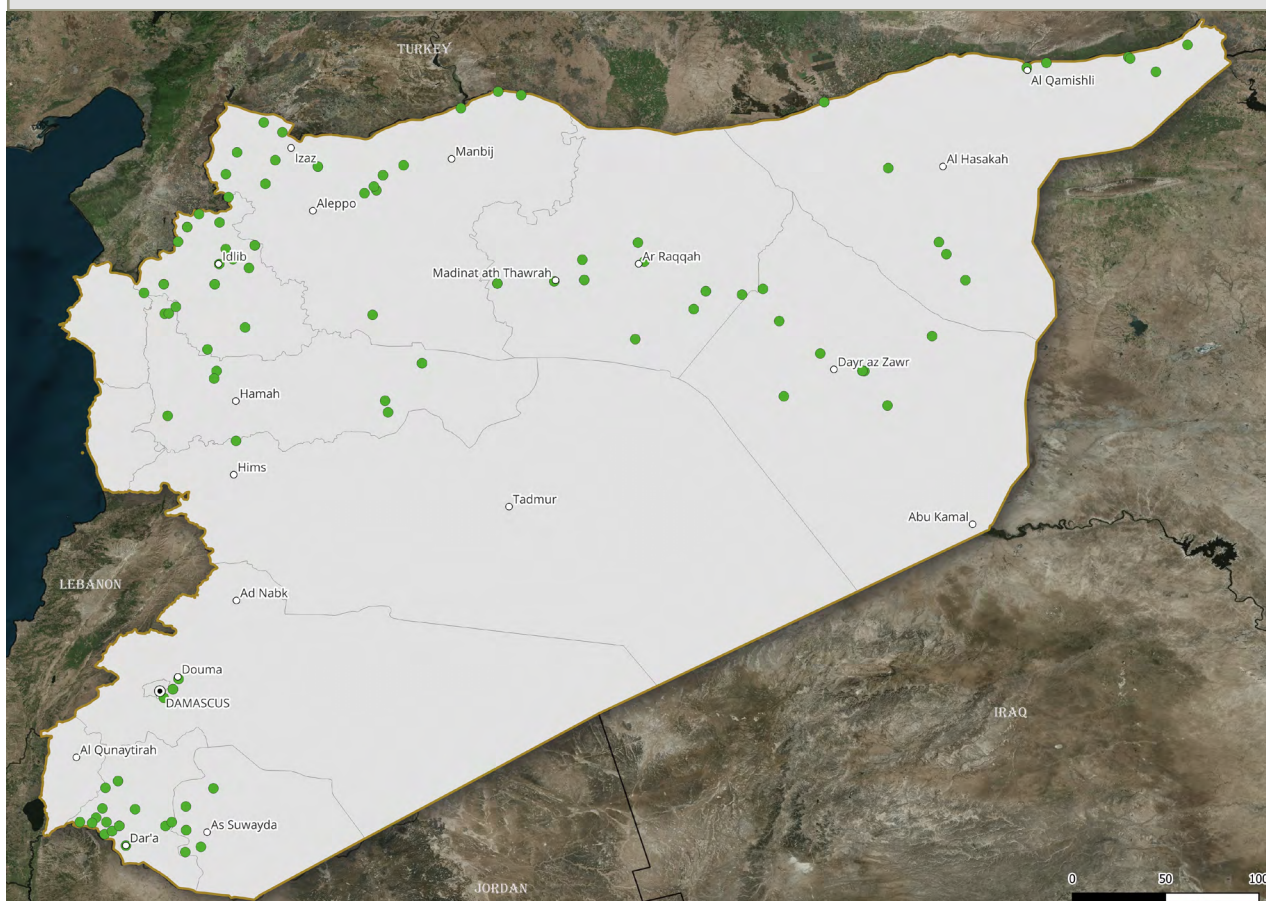
Similarly, there was an overall rise in abductions, arrests, and kidnappings of farm and agricultural workers between 2017 and 2022. These incidents peaked in 2021, when there were 32 such cases. Approximately 54% of incidents occurred in the neighbouring governorates of Deir ez-Zor and Ar Raqqa, while the remaining cases were spread widely across the country. Responsible conflict parties ranged from the Syrian armed forces (which often carried out arrests) to Iraqi border forces and multiple armed groups, including pro-Iranian militias and the Islamic State group. However, there were regional variations. For

example, 16 of the incidents recorded in Deir ez-Zor and Ar Raqqa were perpetrated by the Syrian Democratic Forces, a coalition of rebel groups. In several of these cases up to 30 farm workers were detained for conscription purposes, thereby reducing expertise and capabilities on farms. There is also evidence that some farmers were selected specifically for arrest, abduction or detention due to activities linked to their role in food production and distribution. For example, in May 2022 members of the Syrian regime’s General Intelligence Directorate arrested 11 farmers in rural Al-Mayadin district in Deir ez-Zor governorate on accusations of selling harvested wheat to independent merchants instead of the government.

Nevertheless, many of the incidents of violence against farmers and agricultural workers are likely to be associated with shifts in broader power dynamics during the Syrian conflict. For example, in March 2018 regime forces executed 23 farmers from Kafr Batna and abducted two of their wives after assuming control of the town in Rural Damascus governorate.

Overall, the rise in incidents of violence against farmers and agricultural workers demonstrates that despite the most intense fighting of the Syrian conflict seemingly being over, significant threats remain for farmers. Foremost among these are the landmines and explosive remnants of war littering their fields.

Figure 7: Incidents in which farmers and agricultural workers in Syria were shot with firearms, 2017-2022 (121 recorded incidents)



August 2022: Regime forces opened fire on a group of farmers after allowing them to go to their lands to work in Tafas town in the Daraa governorate countryside. The exact number of casualties is unknown.

February 2022: Nine shepherds were killed around Ghanim al-Ali village in the Ar Raqqa governorate countryside by unknown gunmen.

May 2020: One farmer was killed when Turkish forces opened fire on farmers working in the cotton fields near Dirwana Agha village close to the Turkish border in Al-Hasakah governorate.

Attacks on Infrastructure and Basic Services

The war has had catastrophic implications for the state of crucial Syrian physical infrastructure and basic transportation, electricity, and water services. Between 2011 and 2021 Syria's total electricity production **fell** by 57%. Freight and passenger transport **ceased** throughout most of the country following the outbreak of war, leading to a 79% reduction in passengers and a 91% reduction in freight traffic. Similarly, it was **estimated** that as early as 2014, 35% of Syria's water treatment plants had been damaged. In total, physical infrastructure recovery and reconstruction costs in 14 of Syria's largest cities were **estimated** in 2022 to stand at US\$ 6.3 billion-8.5 billion.⁶

This report is limited to the discussion of violence affecting water infrastructure due to better data on specific conflict events affecting the water infrastructure. Water has a paramount importance for Syrian agriculture due to the country's semi-arid climate and recurrent droughts, which mean that irrigation is crucial for growing crops and general food production. Transportation and electricity infrastructure are equally important for food security. Transportation is key for food distribution. Electricity allows for food to be cooked, a balanced diet to be eaten and agricultural commodities such as **fertiliser** to be produced. A recent World Bank analysis **found** that among physical infrastructure, "Agrifood Value Chains" are "by far the most heavily affected" by the war; they account for "50% of total physical infrastructure damage" worth US\$ 3.4 billion, with this damage being "largely related to irrigation systems".

Damage and destruction of water infrastructure

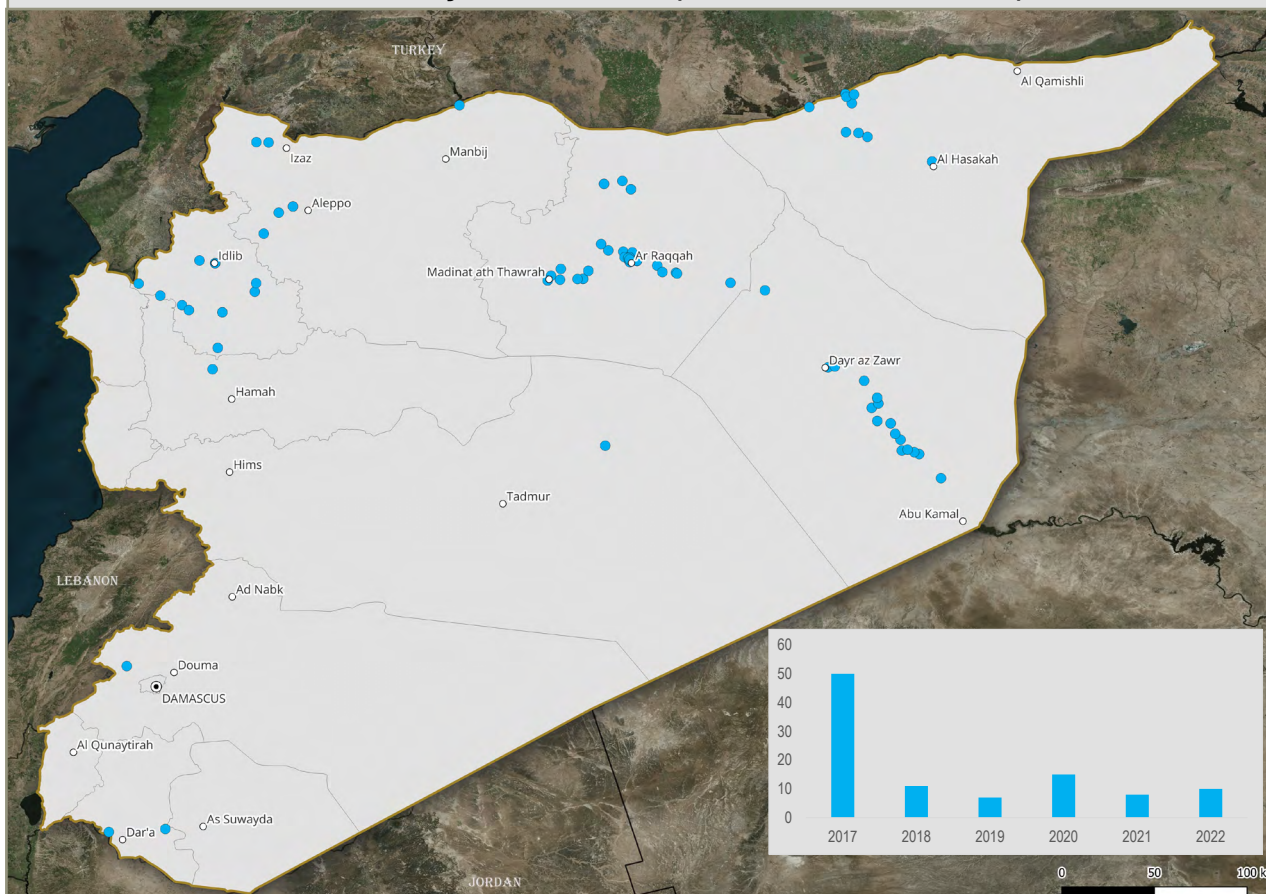
In the 2017-2022 period 101 incidents of violent actions that affected water infrastructure or facilities were identified, with these most frequently recorded in the governorates of Ar Raqqa, Deir ez-Zor and Idlib.⁷ Approximately half of these incidents were recorded in 2017 alone. The attacks were often carried out by aircraft- or drone-delivered air strikes, with these incidents accounting for 43% of the total. The conflict parties responsible for these strikes included the armed forces of Syria, Russia, Türkiye and the US-led international coalition. In many instances air strikes led to the complete destruction of facilities and infrastructure. For example, in March 2017 air strikes conducted by the US-led international coalition completely destroyed water tanks in Khas Ujayl village in Ar Raqqa governorate and led to water cuts across the village. More recently, in January 2022 the Arshani water pumping station was substantially damaged by Russian air strikes. Although it was **repaired and reactivated** 18 days later, 225,000 people served by the pumping station were without consistently clean drinking water for over two weeks.

A similar proportion of incidents (42%) involved either landmines, UXO or IEDs (23 incidents) detonating, or shelling, artillery, or missile fire (19 incidents) hitting infrastructure such as water pipelines, pumps, water tanks and wells. At least 15 of these incidents were perpetrated by the Islamic State group, 12 of which were reported in Ar Raqqa governorate in 2017. Other conflict parties included the armed forces of Syria and Türkiye, and an array of unidentified armed groups. Often these incidents led to water cuts for civilians. This was the case in May 2017, when Islamic State fighters detonated explosives against a water tank in Mazraat Huttein village in Ar Raqqa.

There were also 11 cases in which water infrastructure that included water tanks, pump engines and pumps were looted. Eight of these were perpetrated in 2020 by rebel groups operating under Türkiye's Operation Peace Spring, which carried out their actions in Al-Hasakah governorate in all except one case.

Many of the attacks on water infrastructure and facilities are likely to have been perpetrated by conflict parties as a deliberate strategy to enhance their control over target populations and territories. This was the case when Türkiye conducted air strikes on the Alouk water

Figure 8: Reported violent action incidents affecting water infrastructure and facilities in Syria, 2017-2022 (101 recorded incidents)



July 2021: The water pumping station in the al-Rouj area in Idlib governorate, which served 3,500 hectares of farmland, was completely destroyed by air strikes carried out by Russian forces.

May 2017: Water cuts affected Mansura village in Ar Raqqa governorate following the detonation of IEDs against a water tank by militants from the Islamic State group.

station in Al-Hasakah governorate in October 2019 hours after its forces had launched Operation Peace Spring. The bombing rendered the station inoperable, which, in addition to Türkiye switching off the water supply, meant that access to water was limited for **460,000 people**. It took 35 days for talks to be initiated to reactivate the station. Similarly, in 2017 the Islamic State group **deliberately** “contaminated drinking water in governorates including Deir ez-Zor, Ar Raqqa and Aleppo to widen its domination of the population”.

These attacks exacerbate an already difficult situation for Syrian agriculture and food production. Syria has a semi-arid geography, meaning that ensuring access to water has always been “**tenuous**”. Added to this, drought has increased demand: some of the **worst droughts on record** were experienced in 2020 and 2021, especially in the northern and eastern regions of Syria. Consequently, efficient water systems are crucial for the supply of water to the population and, most importantly, the irrigation of agricultural lands and crops. Indeed, in 2019 Syria’s annual water requirements were **estimated** at approximately 12.9 billion m³, with agriculture thought to use 86-89% of this.⁸

In short, the attacks on water facilities and infrastructure further reduce the water available for crop irrigation. By 2021 the country’s water supply **stood** at 40% less than a decade earlier. Apart from contributing to the reduced production of key crops such as wheat, the shortage of irrigation water has also had further adverse consequences. One farmer and fruit producer from Rural Damascus governorate **noted** in 2021 that he “constantly” argues with his neighbour over “shares of water” to “produce a sufficient quantity of fruits to provide enough income for our families”. Possibly more concerning, many Syrian farmers have been

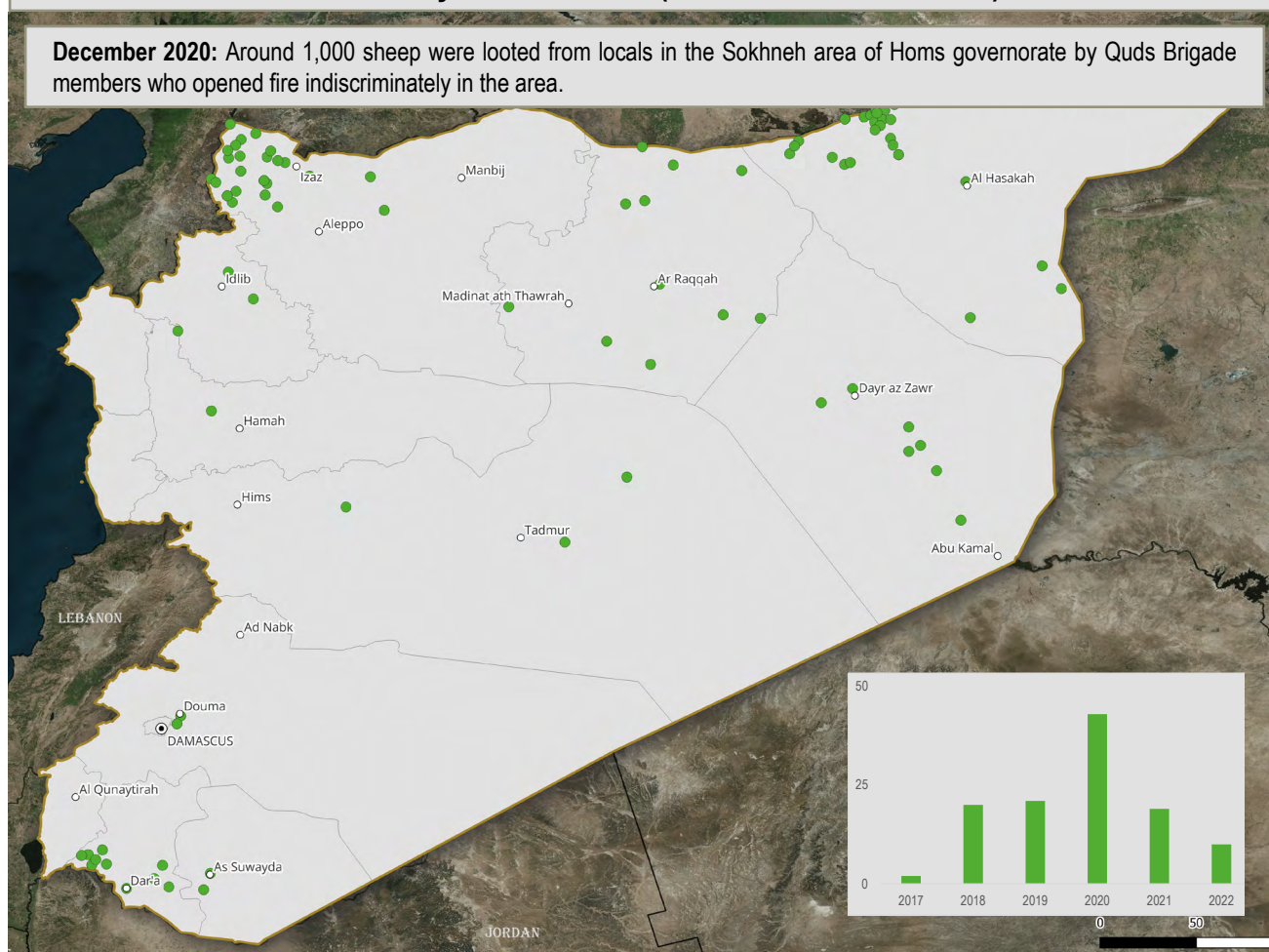
forced to rely on sewage water for their crops. This creates significant risks of contracting diseases for those who eat crops irrigated in this way. Indeed, it may have contributed to the **outbreak of cholera** in Syria in September 2022. By December the illness had spread to 14 governorates, with over 52,013 suspected cases and 98 deaths reported between 25 August and 29 November 2022.

Attacks on Private Assets

Looting of food, crops, agricultural equipment and livestock

At least 115 incidents were identified in which food, crops, agricultural equipment or livestock was looted in the 2017-2022 period. Crops such as wheat and barley were looted most frequently. A third (33%) of incidents took place in Al-Hasakah governorate, while a further 30% were recorded in Aleppo governorate. The remaining incidents were spread widely across Syria. Conflict parties included over 30 armed groups, but the most frequently named were Turkish-backed factions acting under Operation Peace Spring and the Syrian armed forces.

Figure 9: Incidents where food, crops, agricultural equipment or livestock were looted in Syria, 2017-2022 (115 recorded incidents)



Approximately 37% of incidents were recorded in 2020 alone. This was mainly driven by Turkish-backed factions who looted multiple places on single days, most frequently in Al-Hasakah governorate. On 9 May 2020 they looted wheat and barley crops and civilian houses from seven separate locations in Al-Hasakah. It is possible that these were strategic revenge attacks against farmers and other civilians deemed to be disloyal to the Turkish-backed groups. Indeed, later that same month the Turkish-backed Hamza Division **imposed** levies of “seven bags of harvest of wheat and barley on farmers and farmlands’ owners” who refused to pledge allegiance or leave areas under the control of Operation Peace Spring. This was in addition to threatening to burn and loot their harvests.

In addition to attempts to gain political control, there is evidence that in some cases looting was motivated by the practical daily needs of armed groups. For example, in December 2020 members of the Hamza Division cut down almost 750 olive trees in the Afrin district of Aleppo governorate for use as firewood. It is possible that similar motivations of practical utility or desires to sell on items to generate revenue are behind the looting of agricultural equipment, broken tractors and accessories by Turkish-backed factions in Daouiyeh, Al-Hasakah governorate, in April 2020.

Looting was accompanied by physical violence in several cases. In December 2020, after indiscriminately opening fire on locals in the Sokhneh area of Homs governorate, members of the Quds Brigade looted around 1,000 sheep. Meanwhile, in December 2020 members of the Syrian Democratic Forces, a coalition of rebel groups, arrested several shepherds and stole more than 20 sheep.

The **lived experiences** of Syrian agricultural workers suggest that the full scale of looting is likely to be largely under-reported. As such, the figures reported here provide only limited insight into what is likely to be a far more widespread problem than the data suggests. However, regardless of the scale, looting creates several obstacles for food security. In cases where agricultural equipment or tractors are stolen, it undermines the ability of farmers to efficiently cultivate crops. Moreover, even if farmers successfully cultivate land and produce crops, they run the risk that their harvested crops could be stolen by an armed group or militia. This creates significant losses of personal income, meaning farmers have fewer financial resources to invest in products such as fertilisers to improve productivity. It also adds to a wide array of financial challenges for farmers, such as rises in **diesel prices**, which make activities such as harvesting and operating wells more expensive. Finally, looting increases the psychological and mental strains experienced by farmers. This can result in them spending more time guarding crops, tractors and livestock, and less on the agricultural activities themselves.

Changes in land ownership

In addition to the violent actions documented in the main part of this report, the conflict has forced changes in landownership, with complex impacts on food production. The **Syrian Network for Human Rights** (SNHR) noted in a report in February 2021 that at least 440,000 dunums of agricultural land had been seized by the Syrian regime in the suburbs of Hama and Idlib.⁹ Since 2011 anyone deemed to be carrying out either anti-terrorist or anti-government acts could be permanently stripped of property rights. The **Association of Detainees and the Missing in Sednaya Prison** estimated that almost 40% of those detained by the Syrian government after the start of the 2011 uprising have been subject to property seizures, including the confiscation of land. This has also included seizing property from former detainees in exile. People detained by the Syrian intelligence services were often forced to sign confessions while blindfolded, which frequently meant that they signed away both their civil rights and anything they owned, including property. This property has been redistributed to government officials, including members of the intelligence services. The seizures have led to the reshaping of the Syrian property-owning landscape, with properties redistributed in areas previously associated with the start of the protests such as Daraa in the south, Homs and Aleppo.

A report by **Syrians for Truth and Justice** in March 2021 noted also that armed groups of the Syrian National Army (an anti-government armed group coalition) confiscated land from two Kurdish and one Christian family group in Ras al-Ayn city in Al-Hasakah governorate in 2022. Interviewees also reported that SNA armed groups repeatedly tried to seize land. Appropriating land is used both as a way of controlling the population and stalling protests, especially in areas under the control of the Syrian government. It also provides commercial gain where food insecurity has created a lucrative black market in agricultural goods, especially grains. This has a direct impact not only on the families affected by changes in land ownership. It is also likely that it will result in lower crop yields due to less investment in the agricultural sector, while the number of people with experience in managing farmland has also effectively been reduced.

Damage and destruction of tractors and combine harvesters

In addition to looting, there were at least 32 incidents in which tractors and combine harvesters were damaged or destroyed between 2017 and 2022. Three-quarters of these incidents were caused by landmines, UXO or IEDs. The remaining incidents were the result of shelling, artillery or missile fire, and air or drone strikes. Over 70% of these incidents occurred between 2020 and 2022, a trend that is likely caused by the rise in general detonations of landmines, UXO and IEDs in recent years, as documented earlier in this report. Many of these incidents occurred when tractors and combine harvesters were being driven, which also led to the agricultural workers driving them being injured or killed.

The damage and destruction of tractors and combine harvesters add to the problems for food production created by looting, because expensive equipment is rendered inoperable or less efficient and agricultural productivity is therefore reduced.

Attacks on the Food Supply Chain

Damage to and destruction of Bakeries

There were at least 44 reported incidents in the 2017-2022 period in which bakeries were damaged or destroyed in Syria by either air or drone strikes (34 incidents) or shelling, artillery or missile fire (ten incidents). Over 80% of cases occurred in the period 2018-2019.

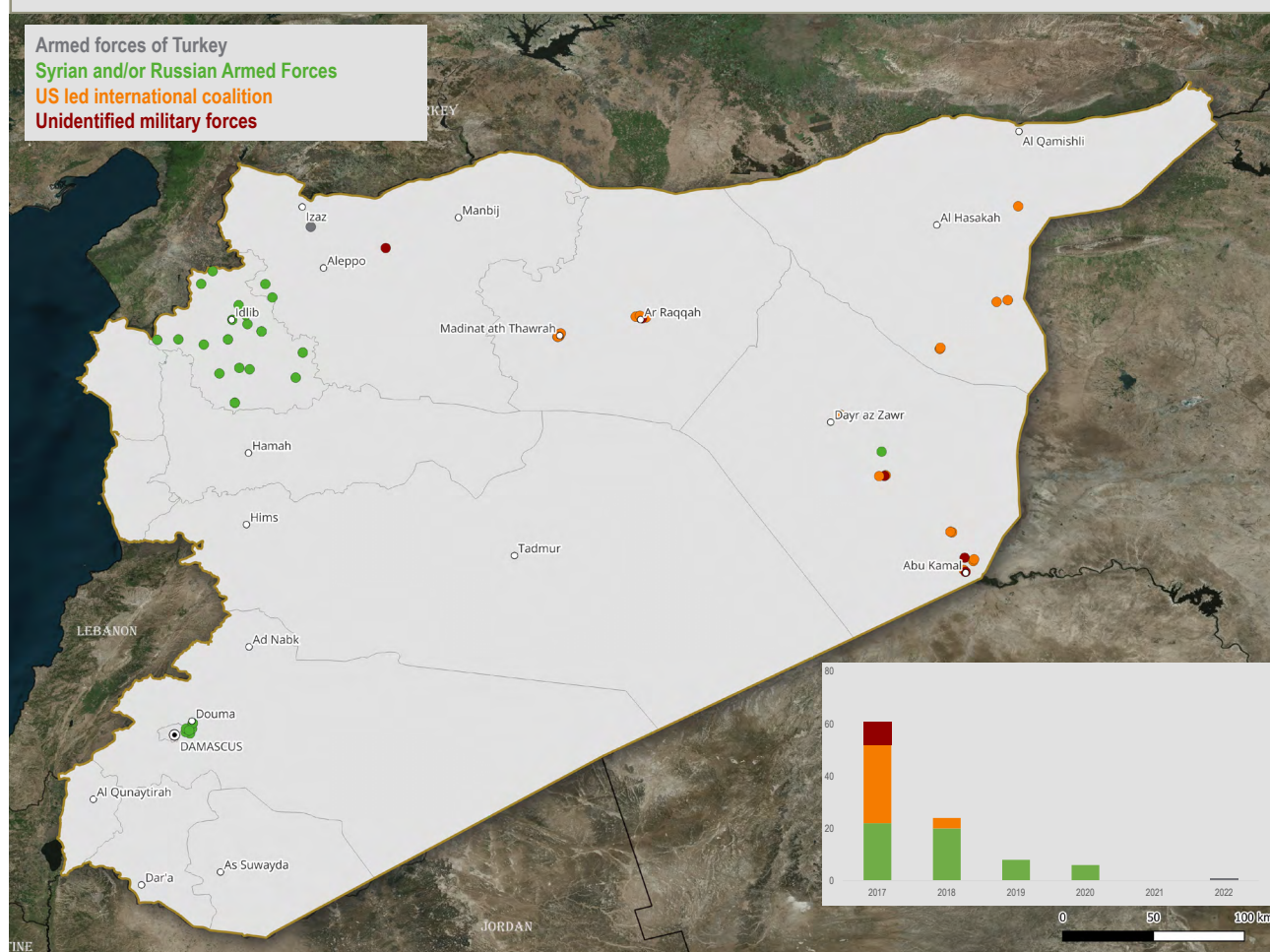
Over half (52%) of incidents were reported in Idlib governorate and a significant proportion (23%) occurred in Ar Raqqa governorate, with the remaining cases spread widely across the country. However, there were notable geographical shifts over time. Over 70% of the cases recorded in Idlib occurred in 2019, with these being perpetrated by Syrian and/or Russian armed forces in all cases. Meanwhile, all cases reported in Ar Raqqa governorate occurred in 2017, with air or drone strikes conducted by the US-led international coalition constituting all but two of the ten incidents. The air strikes are likely to have been conducted as part of the coalition's campaign against the Islamic State group in Ar Raqqa, with bakeries being hit in the process.

Regardless of whether bakeries were targeted deliberately or unintentionally hit or destroyed by the wide-area effects of explosive weapons, the outcome was the same. Key equipment was destroyed and, as occurred in many of the reported incidents, bakeries were rendered inoperable. The destruction of bakeries affected civilians, for whom bread forms a **staple part** of their diet. In **some cases** Syrian bakeries produced three tonnes of bread a day before the war, and civilians were dependent on them for bread. Hence, the inoperability of bakeries is likely to have had significant implications for the food security of Syrians and to have contributed to the country's **bread crises**.

Markets

At least 100 air or drone strikes hit Syrian markets between 2017 and 2022, over 60% of which occurred in 2017.¹⁰ Reported incidents have since declined significantly, with only one recorded case in 2022. Geographically, over 40% were concentrated in Idlib governorate. Other air strikes affecting markets were reported from Ar Raqqa, Rural Damascus, Al-Hasakah, Deir ez-Zor and Aleppo governorates. Close to 60% of incidents were perpetrated by Syrian and/or Russian armed forces. Other conflict parties included the US-led international coalition and, in the only recorded case in 2022, the armed forces of Türkiye. The majority of incidents in which the US-led international coalition affected markets were recorded in Ar Raqqa governorate in 2017 while it was conducting its campaign against the Islamic State group.

Figure 10: Reported aircraft- or drone-delivered air strikes affecting markets in Syria, 2017-2022 (100 recorded incidents)



Despite the reduction in air or drone strikes on Syrian markets since 2017, security threats at markets have persisted. For example, there were at least 50 incidents in which landmines, UXO or IEDs detonated at markets between 2019 and 2022 alone. Beyond the physical damage, the risk of violence and destruction created by this violence affects the sense of security of food sellers and buyers. It can also affect the availability of livestock and decreases food stocks, thereby affecting business income and food prices. Even the possibility that markets could be hit during air strikes or that explosive weapons could detonate in their vicinity can contribute to reduced food security. This is because such possibilities are likely to contribute to driving up prices as the risk – perceived or real – for food sellers and buyers grows and fewer fully functioning markets are available.

Humanitarian food aid

At least 428 incidents that affected aid operations were reported between 2017 and 2022, 92 of which occurred in the context of active fighting, according to Insecurity Insight’s Security in Numbers Database (SiND). However, because aid agencies usually do not report the type of programme affected by security-related incidents, only 19 of these incidents were included in the FIVC-Syria dataset, because they specified that humanitarian food aid programmes had been directly affected. These included reports of access restrictions, lootings and violent attacks against humanitarian food aid distributions. For example, in March 2018 a humanitarian convoy carrying 5,220 food parcels and 5,220 flour bags intended to feed over 26,000 people for a month was prevented from entering the eastern Ghouta region. Meanwhile, in November 2017 a warehouse in the same region was struck by two rockets while food and medical aid distribution was in progress.

Furthermore, Syria remained ranked among the world's five most violent contexts for aid workers in **2021**. The **Aid Worker Security** report published in 2022 stated that 37 aid workers were affected by shelling and air strikes in 2021, ten of whom were killed. According to Insecurity Insight's monitoring, around half of the 209 aid workers reported killed in Syria between 2017 and 2022 were killed through the use of air strikes, missiles or shelling. Just under a third were shot and slightly over 10% were killed by IEDs, highlighting the extent to which the use of military explosive weapons in particular posed a risk to aid workers. International aid agencies were highly conscious of the security risks that their personnel faced in Syria, and this is reflected in the fact that the majority of aid workers killed worked for local aid agencies (175 of the 209) rather than directly for international NGOs or UN agencies, a phenomenon often referred to as "risk transfer" to local partners. At least 14 aid workers were kidnapped, most frequently in Idlib, but also in Aleppo, Daraa and Al-Hasakah governorates. These figures highlight the high risk that aid agencies had to factor into their aid planning, which impacted the delivery of food aid. The reported figure for incidents affecting humanitarian food aid is likely to be a significant under-representation, linked to the fact that aid agencies do not normally report the type of aid they provide. As such, this remains an area in which significant knowledge limitations continue to be an issue. The figures also exclude the impact on humanitarian food aid delivery of the imposition of sieges, **during which** areas are "surrounded by armed actors with the sustained effect that humanitarian assistance cannot regularly enter, and civilians ... cannot regularly exit the area". It was **estimated** in 2019 that 2.5 million Syrians – over 10% of the country's population – had been victims of sieges imposed mainly by Syrian regime and Russian forces. Also not included in this discussion is the impact of border closures on the ability to deliver food aid in Syria.

Concluding Remarks

The aim of this report is to show the extent to which a wide range of military actions carried out by the various conflict actors have affected food security in Syria between 2017 and 2022. It examines these conflict events based on the FIVC-Syria dataset, which is compiled using publicly available data sources, in order to encourage reflections on appropriate policy responses under UN Security Council Resolution 2417 and IHL. The evidence provided underlines the urgent need to protect civilian infrastructure and food systems during conflict.

The findings highlight the myriad factors that can induce food insecurity during conflict, including, among other things, air strikes, UXO and IED explosions, attacks on farmers, inflation, and government policies. The links between hunger and conflict are complex and multifaceted, and the negative impact conflict has on agricultural production, imports and/or consumer purchasing power cannot be reduced to a single factor.

Based on the analysis of 1,732 conflict events, this report has highlighted multiple specific military actions that directly contributed to reducing food production and distribution capacities and interrupting food supply systems more broadly. Air strikes on agricultural land and markets, the burning of fields and crops, landmines, IEDs, and UXO all affect how land is used for food production in both the short and longer terms. The killing of individual farm workers contributes to disrupting food production systems. The bombing of markets and the placing of other explosive devices in areas where markets are held affect people's ability to access food. The security of aid workers was particularly affected by air strikes, shelling and missiles in the period under discussion, as well as targeted killings and arrests, all of which limited the ability of aid agencies to effectively address the rising food insecurity in Syria.

The fact that very specific military actions have a direct impact on food security highlights the urgent need to examine the consequences of military tactics, in particular in relation to the use of explosive weapons and its impact on food security, and how national policies during times of conflict can negatively impact on civilians' ability to access food.

Policy Recommendations

IHL duty bearers, conflict parties and those developing guidance

- All feasible precautions must be taken not to set agricultural land on fire through the use of explosive weapons.
- All feasible precautions must be taken not to hit agricultural land, markets and water supply systems with explosive weapons.
- Conflict parties must refrain from using access to water or the food supply chain as a conflict tactic.
- All stakeholders must be aware that conflict actions have foreseeable long-term consequences for food security.

Aid agencies

Access and security risk management:

- Aid agencies should strive to support local partners in the development of effective security risk management practices and provide such support as an integral part of any cooperation agreements.

Advocacy:

- Aid agencies should clearly highlight the devastating impact that explosive weapons have on their ability to respond to rising food insecurity.
- When engaging in dialogue with militaries on the issue of IHL compliance, aid agencies should advocate that steps be taken to improve food security and should stress the need for priority to be given to ensuring the safety and security of markets and agricultural lands.

Anticipation:

- Aid agencies should develop the expertise needed to include conflict-related prediction in the forward planning of programmes to prevent hunger, noting in particular the findings from this report as to how the use of explosive weapons during hot periods is likely to cause fires that destroy crops and how remnants of war impact the agricultural sector in post-conflict periods.

Researchers

- Researchers and those who report conflict-related events should include detailed descriptions of the wider impacts of many of the reported conflict events in addition to the time and location of an event.
- Researchers should consider how conflict events affect crops, land or infrastructure, and clearly communicate such impacts.
- The research community should engage in further research into the long-term impacts of air strikes, UXO, landmines and IEDs on food insecurity in Syria.
- The research community should develop robust research frameworks and empirical evidence on the relationship between conflict events and food insecurity.

The Links between Conflict and Hunger in Syria

Conflict, Hunger and Aid Access

April 2023



¹ Targeting of Infrastructure in the Middle East (TIME) Project, accessible on request at <https://sites.nicholas.duke.edu/time/about-data/>.

² Armed Conflict Location & Event Data Project (ACLED), acleddata.com, accessed 10/02/2023.

³ Insecurity Insight Security in Numbers Database (SiND), insecurityinsight.org/services/the-data-base, accessed 24/03/2023.

⁴ Airwars US-led Coalition in Iraq & Syria, Civilian Casualties dataset, accessible on request at: airwars.org/conflict/coalition-in-iraq-and-syria/, accessed 24/03/2023.

⁵ This is not a full or comprehensive analysis of the principles outlined in IHL relevant to food insecurity, but serves only to outline key principles. For more in-depth analyses, see, for example, D. Akande and E.-C. Gillard, "Conflict-induced food insecurity and the war crime of starvation of civilians as a method of warfare", BSG Working Paper Series, 2019, bsg.ox.ac.uk/sites/default/files/2019-11/BSG-WP-2019-030.pdf.

⁶ Physical infrastructure in this World Bank report included electricity, transport, water supply and sanitation, and agriculture.

⁷ The FIVC-Syria dataset is likely to underestimate the true extent of violent actions against water facilities and infrastructure in Syria: a [UN](https://www.un.org) report, for example, identified attacks on 37 water facilities in a six month period of 2019 alone.

⁸ In practice, this proportion is likely to be lower due to increased fuel prices and reduced water supply.

⁹ A dunum varies in size according to the area in which the term is used, but a dunum in Syria is 1,000 m².

¹⁰ In the current report markets are defined as the physical location where individuals buy, sell, and exchange commodities such as livestock and food. Locations with a specific focus on selling or exchanging fuel or crude oil were not included in the category of market in this report.

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