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Explosive Weapons Contamination in Syria, Report 1

Southern Syria: As Sweida, Daraa, and Quneitra Governorates

Syria Project, Conflict Mapping

November 2019

Table of Contents

Executive Summary

This study, the first of a series, aims to analyze and visualize the Carter Center Syria Project's conflict mapping data on explosive weapons use in As Sweida, Daraa, and Quneitra governorates to highlight areas at risk of explosive weapons contamination. An interactive version of this study can be accessed here.

The Carter Center has documented at least 36,404 uses of explosive munitions, extrapolated from 9,446 conflict events in southern Syria between July 2013 and May 2019. Because of a variety of factors, including security concerns and limited capacity, not all conflict is reported or documented, so this study does not claim to depict the exact number of events on the ground.

Nearly 57% of the total recorded munitions used were ground-launched explosive weapons, including artillery shells, missiles and mortars, and 42% were air-dropped explosive munitions.

Explosive weapons impacted at least 255 communities[1] in southern Syria. Over 60% of the total recorded explosive munitions occurred in just 15 locations in southern Syria, the majority in Daraa Governorate.

There were similarities in the way explosive weapons were used from governorate to governorate, but there were also differences. Daraa Governorate, for example, experienced a significant number of IEDs, while the other governorates did not.

This report aims to support operational planners, raise awareness among key decision-makers, and highlight the need for an effective, long-term policy response to contamination from explosive weapons.

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[1] The term "communities" refer to a town, city, neighborhood, or point of interest with an associated latitude and longitude.

Introduction

Contamination from explosive remnants of war (ERW), unexploded ordnance (UXO), as well as landmines and improvised explosive devices (IEDs) (see "Terminology" section at end of the study) can pose an enduring threat to a population long after violence has ended. The contamination from these categories of explosive weapons can continue to kill and injure people for years to come and limit a community's future development.

While on-the-ground assessments, surveys, and clearance operations are some of the most effective ways to deal with the physical threat of explosive weapons contamination, these can be challenging to do in Syria because of access and security constraints in parts of the country.

Instead, organizations have turned to desk-based studies to plan future operations that can be carried out when conditions improve, as well as to help prioritize risk-education programs.

The Carter Center aims to contribute to these efforts by analyzing and visualizing its own data on explosive weapons use in Syria between 2013 and 2019.
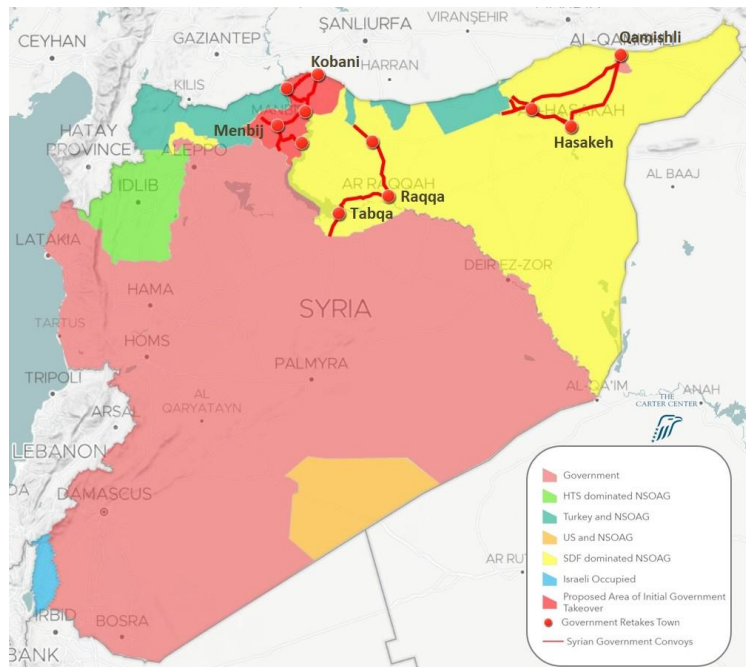

This project provides a detailed view of the scale and complexity of explosive weapons use in Syria. This, in turn, can help with identifying and prioritizing areas that are potentially at risk from explosive weapons contamination and require on-the-ground assessments. However, a variety of factors contribute to the risk of explosive weapons contamination, including ground type, firing conditions, and munitions used.

Figure 1: Areas of control in Syria October 18, 2019.

Methodology

This report is the first in a series exploring explosive weapons use in Syria between July 2013 and May 2019. The focus of this report is on southern Syria, specifically the governorates of Quneitra, Daraa, and As Sweida.

Using primarily open-source data collected by The Carter Center's Syria Project and the publicly available Armed Conflict Location & Event Data Project (ACLED), the team examined 9,446 conflict events in southern Syria to extrapolate individual uses of explosive weapons. An example of the method used to document numbers of explosive weapons:

One conflict event from the Syrian Observatory for Human Rights (SOHR) that states, "Government Forces shelled Duma City on 3 February 2016 using 30 artillery shells, 20 mortar shells and 5 rockets while warplanes carried out at least 10 airstrikes" was recorded as 65 individual uses of explosive munitions (30 artillery shells, 20 mortar shells, 5 rockets, and 10 airstrikes).

While much of the data contains the number of munitions used in an event, such as in the example above, some does not. In those cases, the number of explosive munitions was estimated by assigning a maximum count of 3 to any mention of plural munitions use. For example:

One conflict event that states, "A warplane conducted airstrikes onto Sheikh Miskine in conjunction with heavy shelling onto the town" was recorded as 6 uses of explosive munitions – 3 airstrikes and 3 shelling.

While the count was likely higher, especially when the report included adjectives such as "heavy" or "intense," there was no way to accurately estimate munitions use. Instances that did not mention explosive munitions were not included in the study. These included small-arms fire, heavy machine guns; abductions, kidnappings, detentions, and arrests; (armed) clashes; riots, protests, and demonstrations; stabbings; executions; murder; torture; assault; and curfew or arrest operations.

Notably, previous studies on explosive weapons use in Syria have typically focused on the number of conflict events to determine potential explosive munitions contamination (amongst other techniques) rather than on individual uses of explosive munitions. This means the scale and complexity of the issue often has been underrepresented, a gap this study aims to fill.

After extrapolating individual explosive munitions use from the conflict events, the data was divided into four broad categories: 1) air-launched explosive weapons, 2) ground-launched explosive weapons, 3) cluster munitions, and 4) landmines, improvised explosive devices (IEDs), or unexploded ordnance (UXO). Following this, the data was analyzed and visualized based upon administrative delineations provided by the United Nations Office for the Coordination of Humanitarian Affairs (UNCOHA), which details locations to the neighborhood level.

While a variety of factors contribute to the presence of explosive weapons in an area—including firing conditions, operator error, munitions age, and weather and terrain types—this method of providing a baseline use of explosive weapons could help prioritize communities in need of on-the-ground assessments. There is a potentially higher risk of explosive weapons contamination in areas that have seen higher level of bombardments, as all munitions, regardless of manufacturer, have a failure rate.

This methodology is expected to be refined and enhanced in the future through other studies and additional data, especially on explosive ordinance disposal and clearance. This report is not designed to replace or supersede other methods used in the demining or clearance fields. Rather, it can contribute to a holistic strategy in dealing with the issue of weapons contamination.

As a final note, while The Carter Center strives to record as many conflict events as possible, the restrictive reporting environment in Syria and the high volume of violence make it likely that some incidents have not been recorded. Therefore, figures presented in this report should be viewed as a representation of a minimum situation rather than an exact depiction of every single incident.

Overview

After reviewing 9,546 documented conflict events between July 2013 and May 2019, The Carter Center estimates that a minimum of 36,404 individual explosive munitions were used across southern Syria.

The vast majority of those were from ground-launched weapons of various types (57%) followed by airplanes and helicopters (42%). See Figure 2 below to explore the numbers further.
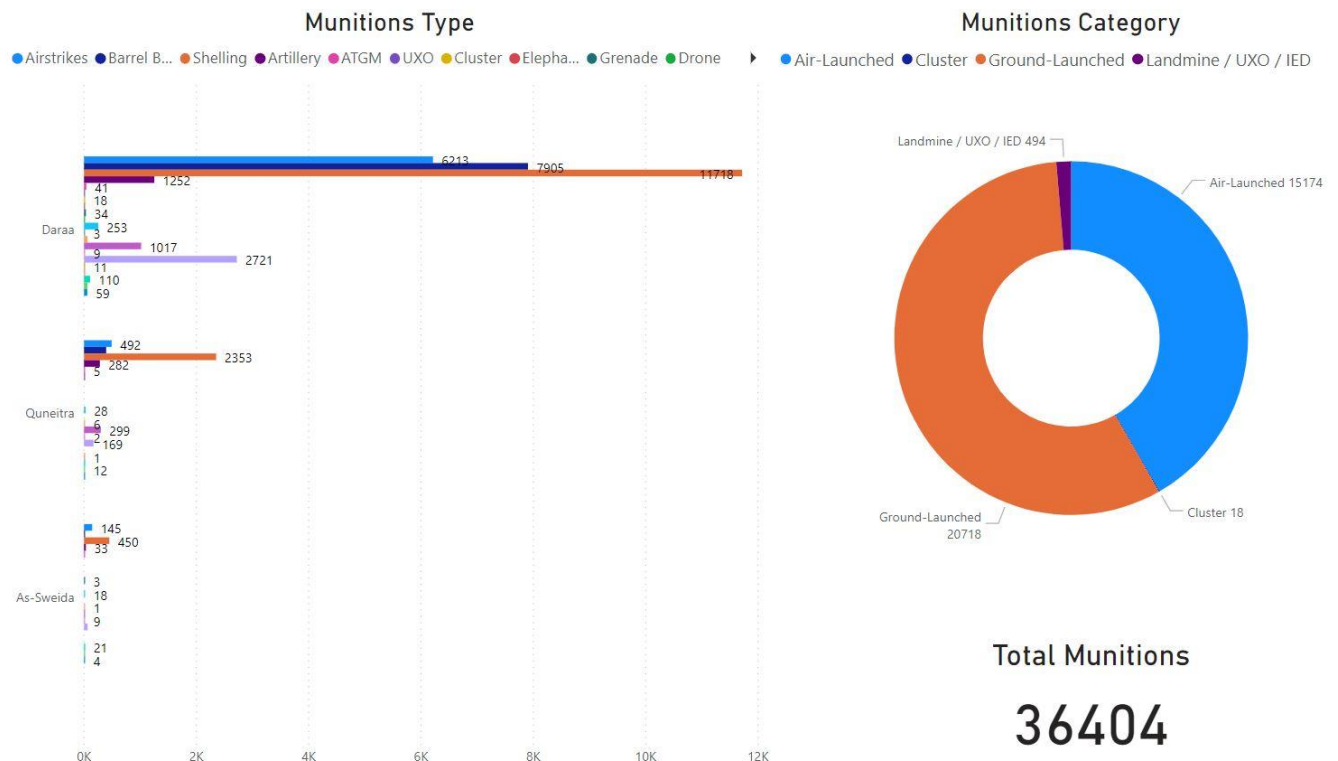

Figure 2: Munitions type breakdown by governorate (left) as well as munitions category breakdown (right). Visit the Center's interactive version of this study to explore the figure further.

Across the three governorates, shelling of unknown types accounted for 40% of munitions use across southern Syria, followed by helicopter-dropped barrel bombs at 23% and airplane-launched munitions at 19%.Various types of rockets, artillery shells, and mortar shells also made up sizable counts of munitions used in southern Syria, with limited activity of cluster munitions,

and landmines or IEDs (Figure 1).[2] Under-reporting of landmine and IED detonation is a strong possibility given the nature of these weapons.

The geographical spread of recorded explosive munitions use in southern Syria shows that at least 300 communities were affected, including neighborhoods in Daraa city. The majority of these occurred in Daraa Governorate, where 31,542 individual munitions were used, followed by 4,075 in Quneitra Governorate, and 783 in As Sweida Governorate.
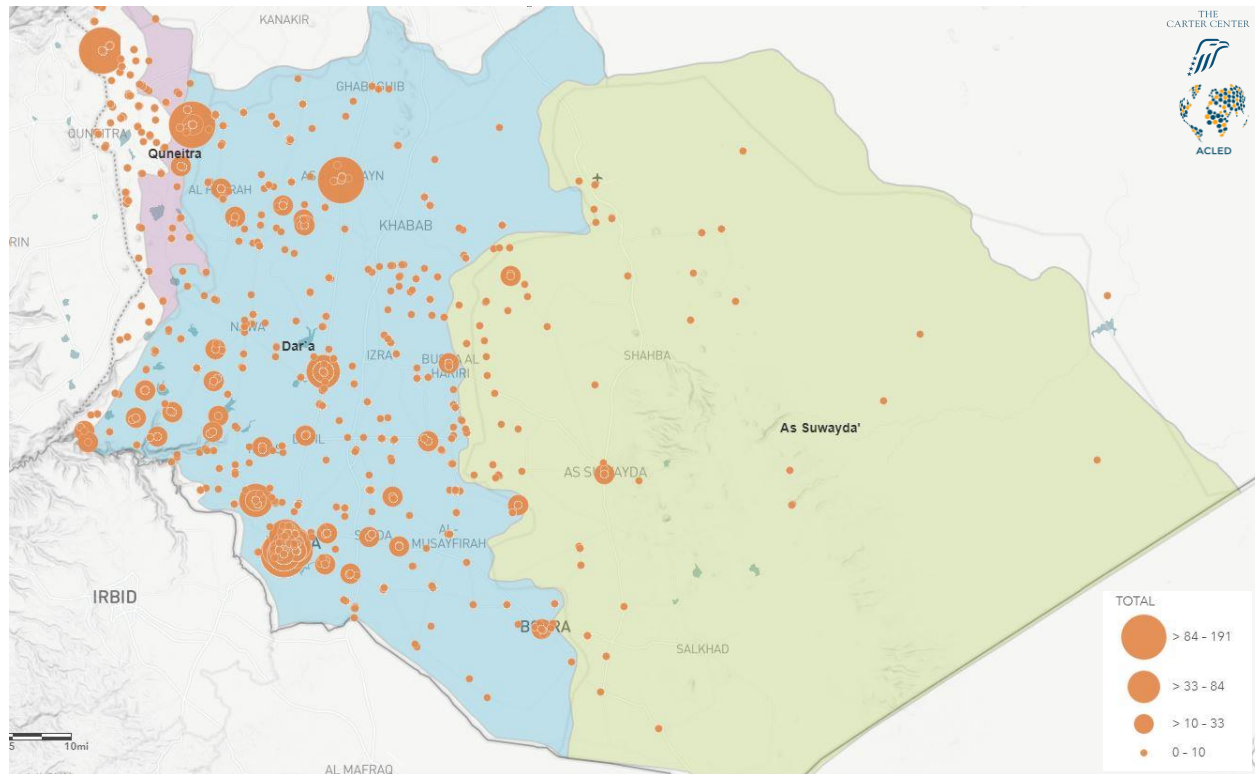

Figure 3: Location of explosive munitions use throughout southern Syria

Over 60% (22,432) of munitions use was split between 15 locations across southern Syria: 10,957 were recorded in Daraa City, an area just 5km by 5km, while the remaining 11,475 were split between 13 communities in Daraa Governorate and two in Quneitra Governorate. Figure 3 highlights these locations. Each governorate will be explored in further detail in the sections that follow.

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[2] Unidentified explosives or IEDs (299), vehicle-borne IEDs (72), tank shells (76), landmines (68), rocket-propelled grenades (11), anti-tank guided missiles (48), grenades (37), suicide-initiated IEDs (41), air- and ground-launched cluster munitions (18), and unexploded ordnance of unknown types (14).

Governorate	District	Sub District	Town / Village	Total No. Explosive Munitions Per	% Total in South
Daraa	Daraa	Daraa	Daraa	10957	30%
Daraa	Izra'	Sheikh Miskine	Sheikh Miskine	1802	5%
Daraa	As-Sanamayn	As-Sanamayn	Ankhel	1148	3%
Daraa	Daraa	Mzeireb	Yadudeh	960	3%
Daraa	Daraa	Daraa	Naima	910	2%
Daraa	Daraa	Da'el	Da'el	890	2%
Daraa	Daraa	Busra Esh-Sham	Busra Esh-Sham	736	2%
Daraa	Izra'	Hrak	Hrak	725	2%
Daraa	Izra'	Nawa	Nawa	712	2%
Daraa	Daraa	Da'el	Abtaa	666	2%
Quneitra	Quneitra	Khan Arnaba	Mashara	648	2%
Daraa	Daraa	Kherbet Ghazala	Western Ghariyeh	591	2%
Daraa	As-Sanamayn	As-Sanamayn	Harra	576	2%
Daraa	Daraa	Daraa	Atman	562	2%
Quneitra	Quneitra	Quneitra	Quneitra	549	2%

Figure 4: Locations that saw over 60% of munitions use in southern Syria between July 2013 and May 2019.

As Sweida Governorate

Out of 231 documented conflict events in 69 communities in As Sweida Governorate, at least 783 individual uses of explosive munitions were recorded. This represents only 2% of the total estimated munitions use in southern Syria.

The most common explosive munitions used in the governorate were ground-launched explosive munitions, which represented 75% (593) of recorded uses there. Aerial-launched munitions represented 21%, most involving airplane-dropped munitions (145). Landmine, IED, and UXO uses represented just 4% of documented activity in the governorate. There were no documented uses of cluster munitions.

Explosive munitions use was predominantly focused in the Shahba district in the northeast of the governorate, specifically in the Shaqa subdistrict located along the border with Rural Damascus Governorate, which recorded over half of explosive weapons use in As Sweida Governorate. Areas around the towns of Shajart (82), Qasr (60), and Mazraa al Harran (12) saw the majority of this activity. The remaining 629 explosive munitions were split between 66 communities across the governorate.
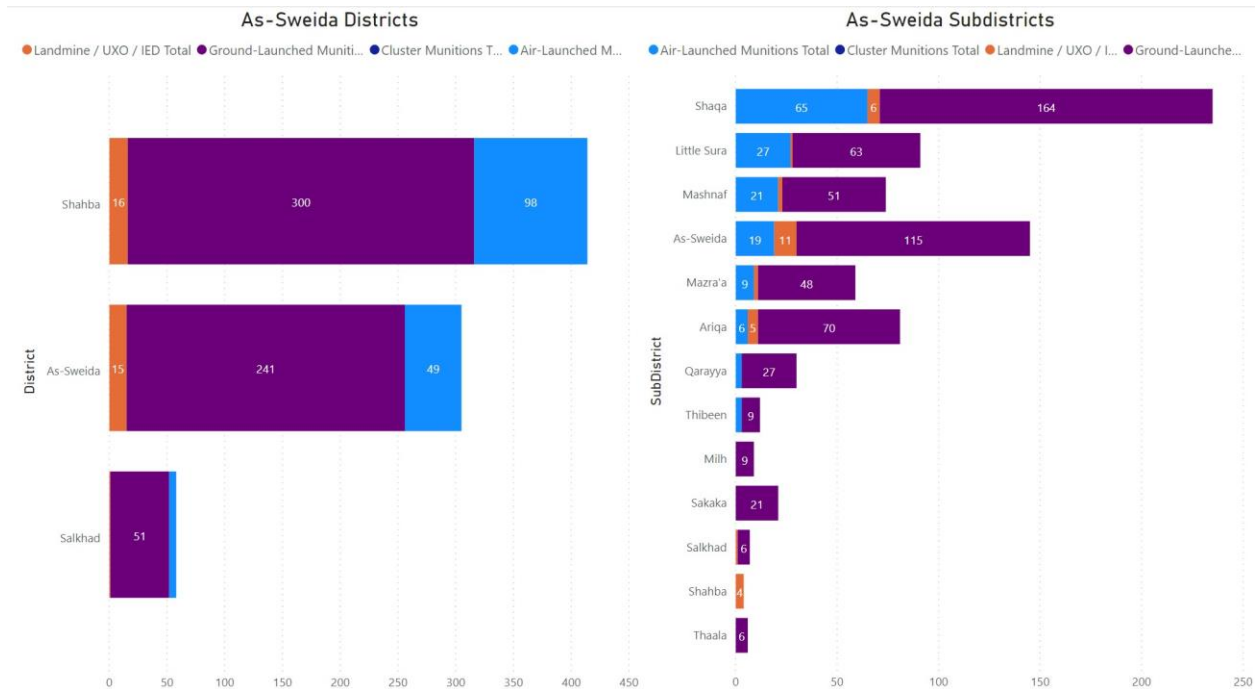
Figure 5:Munitions category breakdown by district and subdistrict in As Sweida Governorate.

This data aligns with the low intensity of the conflict in As Sweida. Overall, the governorate was largely excluded from the fighting because of its lower population densities, terrain, unique ethnic and political makeup, as well as the low number of strategic military sites there. The frontlines between government- and non-government-aligned entities that formed to the west of the governorate during the conflict largely remained static and within Daraa Governorate's administrative boundaries – although conflict occasionally spilled over to the western peripheries of As Sweida.

The remote, mountainous, often seasonally inhabited semi-deserts in the northeast of As Sweida saw the most conflict activity in the governorate. The difficulty in patrolling and maintaining control in such a challenging environment made the establishment of fixed frontlines difficult, affording both government- and opposition-aligned actors, especially ISIS, opportunities to operate more freely in the area throughout the conflict. Mazraa al Harran and Shajarat, key hubs for transportation in the area, were subjected to conflict, which also affected communities close by.

Daraa Governorate

At least 31,518 individual uses of explosive munitions were recorded in 135 communities across Daraa Governorate, representing 87% of the total activity in southern Syria. Ground-launched munitions were the most commonly used explosives in the governorate, accounting for 54% of instances.

Ground-launched munitions made up 45% of estimated munitions uses, primarily shells of unknown type. It was not always possible to determine the exact type of munition used. Rockets (2,721), artillery shells (1,252), and mortars (1,017) also made up sizable proportion of munitions. IEDs, landmines, UXOs, and cluster munitions were also present in the governorate but in much smaller numbers.
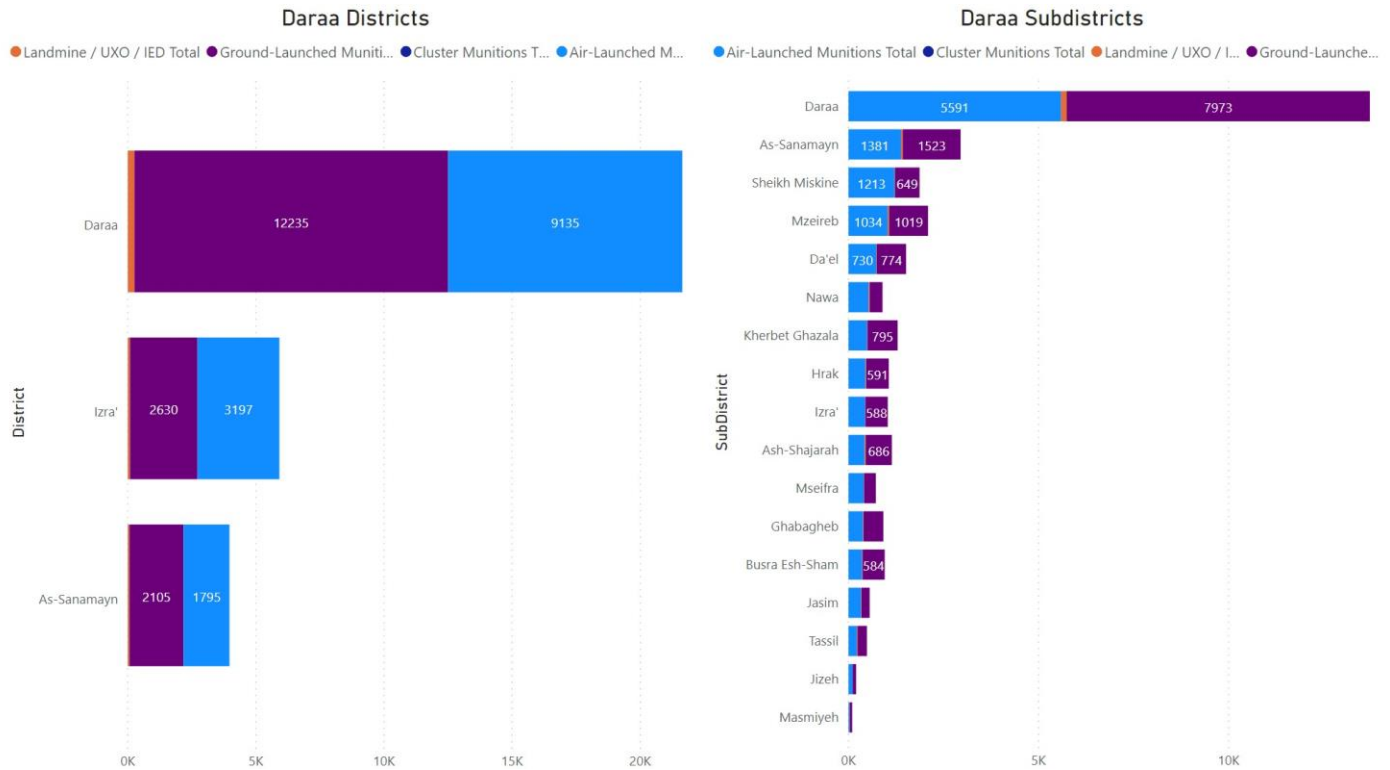
Daraa Districts

● Landmine / UXO / IED Total ● Ground-Launched Muniti... ● Cluster Munitions T... ● Air-Launched M...

Daraa Subdistricts

● Air-Launched Munitions Total ● Cluster Munitions Total ● Landmine / UXO / I... ● Ground-Launche...

Figure 6: Munitions category breakdown by district and subdistrict in Daraa Governorate.

Unsurprisingly, nearly half (43%) of estimated explosive weapons in the governorate was concentrated in Daraa city and its environs in the Daraa subdistrict, the birthplace of the Syrian uprising. Outside of Daraa subdistrict, former opposition hubs such as Sheikh Miskine, Yadudeh, Ankhel, Dael, and Hrak towns recorded 18% (5,525) of recorded munitions use in the governorate.

This activity aligns with conflict trends seen in Daraa Governorate. Typically, bombardments focused on major population hubs that often housed key command centers for different armed actors as well as major road infrastructure, particularly the M5 highway.

Explosive munitions use, especially airplane- and helicopter-dropped munitions and ground shelling, also often preceded ground assaults to break through frontlines. These occurred along the border with As Sweida Governorate and around Zamrin and Hara in the northwest. Major offensives by Syrian government and aligned forces took place in 2015 around Sheikh Miskine and Daraa city, and again in mid-2018 when the government retook the south from various non-state armed actors, including Hayyat Tahrir ash Sham and a local ISIS affiliate called the Khalid Bin Walid Army.

Quneitra Governorate

Representing 11% of total explosive munitions use in southern Syria, at least 4,048 individual uses were recorded in 55 communities across Quneitra Governorate. Most common was the use of shells of unknown type, which made up 58% (2,353 instances). Air-dropped munitions accounted for 22% , split between airplane-dropped munitions (492) and helicopter-dropped munitions, namely barrel bombs (395). Just 35 instances of landmine, IED, and UXO events were recorded in the governorate, despite the presence of mine fields close to the U.N.-mandated Alpha line with the Israeli-occupied Golan Heights.

Explosive munitions use was predominantly focused in the Khan Arnaba subdistrict (58%), which borders the easterly extent of the U.N. buffer zone between Syria and the Israeli-occupied Golan Heights – the Bravo line. Thirty-five percent (1,448) of instances in the governate occurred in the towns of Mashara (648), Jbata al-Khashab (353), Baath (231), and Khan Arnaba (216). Other cities that accounted for high numbers of explosive munitions use were Quneitra city (511) and Hamediyyeh (302). The remaining 38% (1,458) of munitions use in Quneitra Governorate was split across 48 communities.
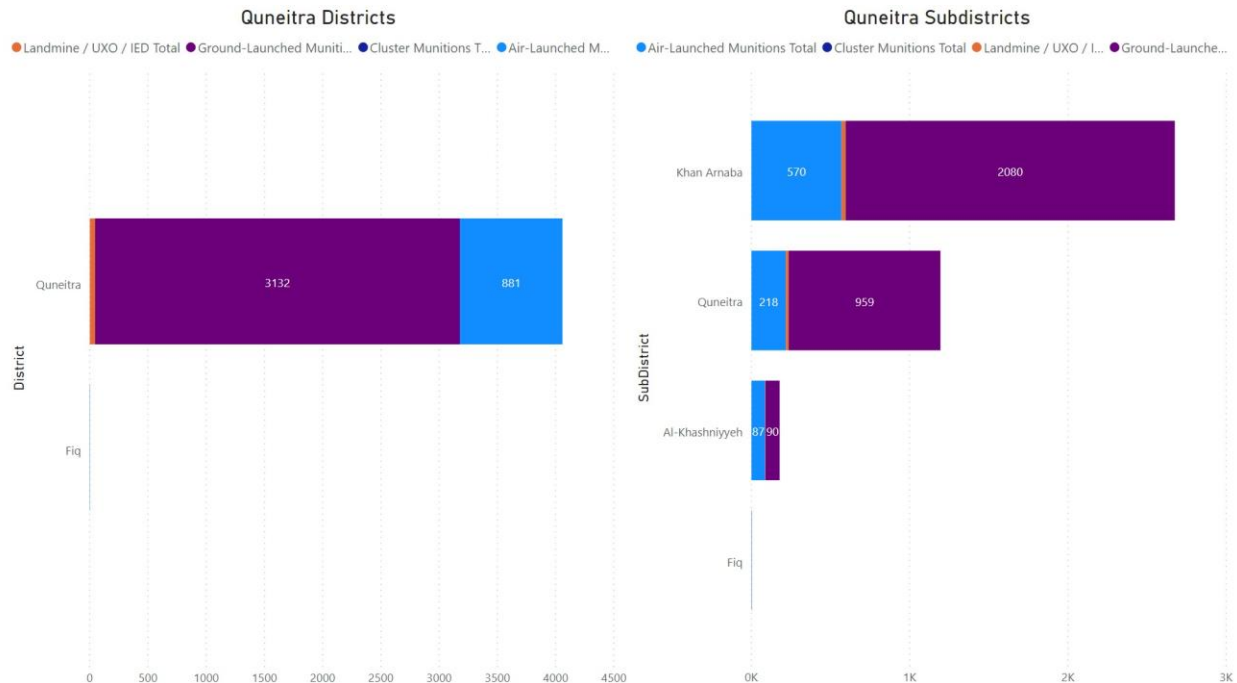

Figure 7: Munitions category breakdown by district and subdistrict in Quneitra Governorate.

The data collected on explosive munitions use matches conflict trends in the governorate. Fixed frontlines between government and non-government armed groups formed in the north of the governorate from Hamediyyeh town westward to Western Samadaniyeh and Mashara towns, before continuing into the northwest section of Daraa Governorate around Haraa. Because of its mountainous terrain, a small corridor from Jbata al Khashab to the hilltop town of Hadar also emerged as a frontline in the northwest of the governorate, close to the border with the Israeli-occupied Golan Heights.

Conclusion

While documenting 36,404 explosive munition uses in southern Syria cannot fully predict explosive weapons contamination, it is nonetheless helpful. This study can aid operational planners in identifying areas to prioritize for on-the-ground assessments of weapons contamination and risk-education programs.

Additionally, the study aims to provide policymakers with an understanding of the scale of explosive weapons use in southern Syria, the complexity of the challenge, and the need for a response that is grounded in detail.

Previous studies have highlighted the long-term psychological, social, economic, and environmental effects associated with explosive weapons contamination, in addition to the death and injury they cause. Explosive weapons clearance is labor intensive and time consuming.

For example, in Angola, where a civil war raged from 1975 – 2002, clearance is still ongoing. In Iraq, where explosive weapons have been used extensively during various conflicts (including the Iran-Iraq War, the Gulf War, the U.S.-led invasion in 2003) decontamination efforts have been ongoing for nearly 40 years. Mozambique's 30-year conflict ended in 1992, and major clearance operations concluded only in late 2015. In short, demining and clearance is a multigenerational challenge.

One barrier for decontamination programs (which usually include clearance, risk education, victim assistance, and the coordination of these activities) is the cost. The 21 mine action projects listed in UNMAS' portfolio cost an average of US$27 million each. Policy decisions regarding resource mobilization for decontamination projects therefore should be focused on a long-term, sustainably funded responses. Momentum is building for this sector in Syria. In July 2018, UNMAS established its first office in Damascus after a memorandum of understanding was signed with the Syrian government that builds on its operations from Gaziantep, Turkey, since 2015. Currently, the UNMAS office coordinates 27 U.N. partners and international and local NGOs around the country. Demining and explosive munitions clearance operations offer conflict actors the opportunity to collaborate on a common goal.

The U.N. Mine Action Strategy for 2019 – 2023 views the life-saving activity as key to helping communities return to a "prosperous economic and social life" as well as an important "nexus between humanitarian action, peace and security, and development, as well as a cornerstone for conflict prevention."

Appendix 1

Terminology

As terminology used in the explosive weapons clearance and demining field is highly specialized and often used interchangeably outside the sector, the following section highlights commonly used terms in this study and the demining field. Definitions for these terms were compiled from International Mine Action Standards (IMAS 04.10) Second Edition (May 2013) as well as from Conflict Event Data and Beyond from World Bank Training Workshop March 2018.

Ammunition, munition, or munitions are complete devices charged with explosives, propellants, pyrotechnics, initiating composition, or nuclear, biological, or chemical material for use in military operations, including demolitions. In common usage, "munitions" are often referred to as military weapons, ammunition, and equipment.

Clearance in the context of mine action refers to the tasks or actions to ensure the removal and/or the destruction of all mine and ERW (see below) hazards from a specified area to a specified depth.

Cluster Munition(s) refers to a conventional munition that is designed to disperse or release explosive submunitions that each weigh less than 20kg and includes those explosive submunitions. It does not include a) munition or submunition designed to dispense flares, smoke, pyrotechnics, or chaff, or a munition designed exclusively for an air defense role; b) a munition or submunition designed to produce electrical or electronic effects; c) a munition that in order to avoid indiscriminate area affects and the risks posed by unexploded sub munitions has all of the following characteristics (i) each munition contains fewer than 10 explosive submunitions; (ii) each explosive submunition weights more than 4kg; (iii) each explosive submunition is designed to detect and engage a single target object; (iv) each explosive submunition is equipped with an electronic self-destruction mechanism and (v) each explosive submunition is equipped with an electronic self-deactivating feature.

Demining involves activities that lead to the removal of mine and ERW hazards, including technical survey, mapping, clearance, marking, post clearance, documentation, community mine action liaising and handover of cleared land. International Mine Actions Standards (IMAS) considers mine and explosive remnants of war (ERW) clearance one part of the demining process.

Explosive Ordnance Disposal (EOD) is the detection, identification, evaluation, render safe, recovery and disposal of explosive ordnance or munitions.

Explosive Ordnance (EO) or munitions refers to all munitions containing explosives, nuclear fission or fusion materials, and biological and chemical agents. This includes a broad range of weapons that use components that are explosive in nature, such as bombs and warheads; guided and ballistic missiles; artillery, mortar, rocket, and small-arms ammunition; all mines, torpedoes, and depth charges; pyrotechnics; clusters and dispensers; clandestine and improvised explosive devices. The explosive munitions included in this study are airstrikes, incendiary airstrikes, barrel bombs, cluster munitions, drone attacks, rockets, improvised rockets, incendiary rockets, artillery, incendiary artillery, tank shelling, mortars, shelling of unknown type, incendiary shelling, anti-tank guided missiles (ATGM), rocket-propelled grenades (RPG), grenades, suicide vehicle-borne improvised explosive devices (SVBIEDs), vehicle-borne improvised explosive devices (VBIEDs), person-borne improvised explosive devices (PBIED), improvised explosive devices (IED), unidentified explosives, landmines, and unexploded ordnance of unidentified type (UXO).

Explosive Remnants of War (ERW) refers to both abandoned explosive ordnance and unexploded ordnance (UXO), though not landmines. These are all explosive munitions left behind after a conflict and can be used or unused. This includes conventional ground- and air-launched explosive weapons, such as artillery and cluster munitions, as well improvised weapons.

Improvised Explosive Device(s) (IED) are devices placed or fabricated in a makeshift or improvised manner (with whatever materials are available) incorporating explosive material, destructive, lethal, noxious, incendiary, pyrotechnic materials, or chemicals designed to destroy, disfigure, distract, or harass.

Landmines are explosive devices designed to lie hidden in an area (sometimes for years) and kill or injure people who trigger the device. These victim-triggered devices can be classified as anti-personnel, which are activated by a person or animal stepping on them, or anti-vehicle, which are activated when a vehicle drives over them. The International Mine Ban Treaty prohibits their use, and their clearance is conducted in a specialized way. Increasingly, this category covers improvised explosive devices (IEDs), which act as improvised landmines as they are also typically victim-triggered.

Unexploded Ordnance (UXO) are munitions that are used in conflict and for some reason fail or partially fail to detonate. These unstable explosive devices are left behind during and after conflicts and pose dangers similar to landmines.

THE CARTER CENTER SYRIA PROJECT'S CONFLICT MAPPING

Since 2012, The Carter Center's Conflict Resolution Program has endeavored to analyze open-source information related to the Syrian conflict in as much detail as possible, with the goal of providing mediators and conflict responders with up-to-date, detailed analysis of developments in the country. Using these publicly available resources, as well as information gleaned from regular consultations with stakeholders, the Center has documented and mapped 155,000 conflict events in Syria, with support from ACLED, as well as the ever-changing relations between armed groups. For more information, visit our website at www.cartercenter.org.

The Center's Syria Project also produces weekly conflict summaries, covering the main developments of the week. To sign up, please visit https://www.cartercenter.org/peace/conflict_resolution/syria-conflict-resolution.html and select "Subscribe Now."