

Occupied
Palestinian Territory
Education Cluster

Verification of damages to schools

based on proximity to damaged sites

Gaza, Occupied Palestinian Territory

26 March 2024

Update # 2

Background

- In Gaza, 17 years of blockade combined with recurrent conflict have damaged and destroyed an already fragile education infrastructure: increasing pressure on education facilities, disrupting education provision, and impacting the psychosocial wellbeing of children and teachers. The recent hostilities in Gaza has tragically witnessed a high trend of attacks on school facilities, exacerbating the already dire humanitarian situation.
- Since October 7th, the Education Cluster “EC” has been monitoring and reporting on damages to schools through initial reports from Cluster partners in the field, UNOCHA, and UNRWA. In addition, the EC has activated the Education Cluster Assessment Team (ECAT) that has been deployed to verify damages on each occasion the situation allowed.
- The Education Cluster published the first update “Verification of damages to schools based on proximity to damaged sites” on the 10th of January.

Objective

Due to the increased access limitation to the field especially in Gaza and North Gaza governorates, and the intense Israeli bombardment from air, land, and sea across much of the Gaza Strip, in addition to recurrent telecommunication shutdowns, the Cluster administered a Satellite-derived Damage Assessment to:

- To update the results of the previous report on school damages based on proximity to damaged sites including new trends and severity of damages.
- To better understand the situation of school buildings and the severity of damage, especially in areas with limited field access.
- To help in updating the Flash Appeal as part of the Cluster Response Plan and allocate resources where they are most needed, ensuring a swift and effective recovery process.
- Communicate the impact of the ongoing hostilities on school facilities to the public, including humanitarian actors. This information helps raise awareness about the severity of the situation and can facilitate evidence-based engagement in recovery efforts.

Methodology

- **Tools:**

- ArcGIS Pro – mapping environment
- Python Script with ArcGIS Toolbox UI

- **Sources:**

- UNOSAT damage assessments:
 - Analysis by the United Nations Satellite Centre (UNOSAT)
Damage_Sites_GazaStrip_20240229

- **Satellite Imagery:**

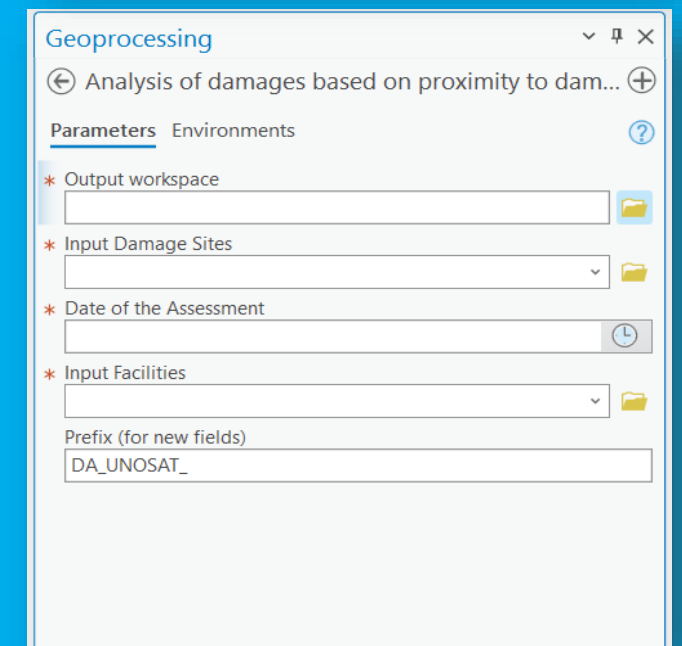
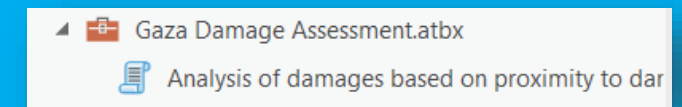
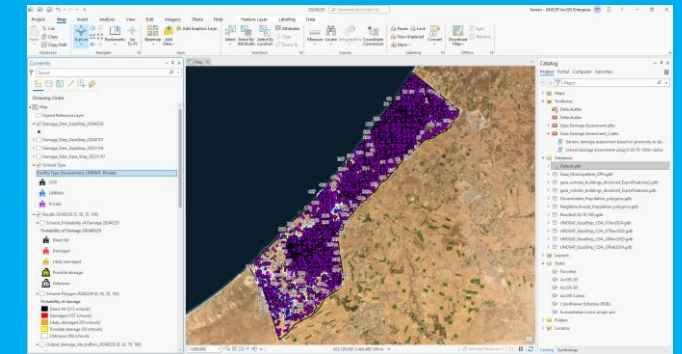
- 03 February 2024 © Maxar 2024
- 29 February 2024 © Maxar 2024

- **Boundaries: OCHA oPt**

- **School facilities (GPS coordinates): Palestinian MoE**

- **Microsoft Building Footprints:**

- *Bing Maps is releasing open building footprints around the world. Which have detected 1.28B buildings from Bing Maps imagery between 2014 and 2023 including Maxar, Airbus, and IGN France imagery. The data is freely available for download and use under ODbL.*



- **Methodology:** classify the probability of damage to school buildings (using building footprints) based on the proximity to damage sites identified by UNOSAT.
 - **Direct hit:** at least one school building has been **directly** hit and at least one damaged school structure has been identified within school premises.
 - **Damaged:** at least one damaged site has been identified within 30m of the school buildings. This could indicate **severe damage** to school structures. A hit within school premises but not directly to a building (for example: a hit to school playground) is classified under this category.
 - **Likely damaged:** at least one damaged site has been identified within 30-70m of the school buildings. This could indicate **moderate damage** to school structures.
 - **Possible damage:** at least one damaged site has been identified within 70-100m of the school buildings. This could indicate **minor damage** to school structures.
 - **Unknown:** school buildings with no reported damage sites within 100m. This could indicate that school structures have not sustained damage.

Gaza Strip

The **Gaza Strip** (365 km²), with **2.3 million** population is one of the most densely populated areas in the world at 5,900 residents/ square kilometer.

More than **625K** students and **22K** teachers previously attended **813** schools (operating in **563** school buildings).

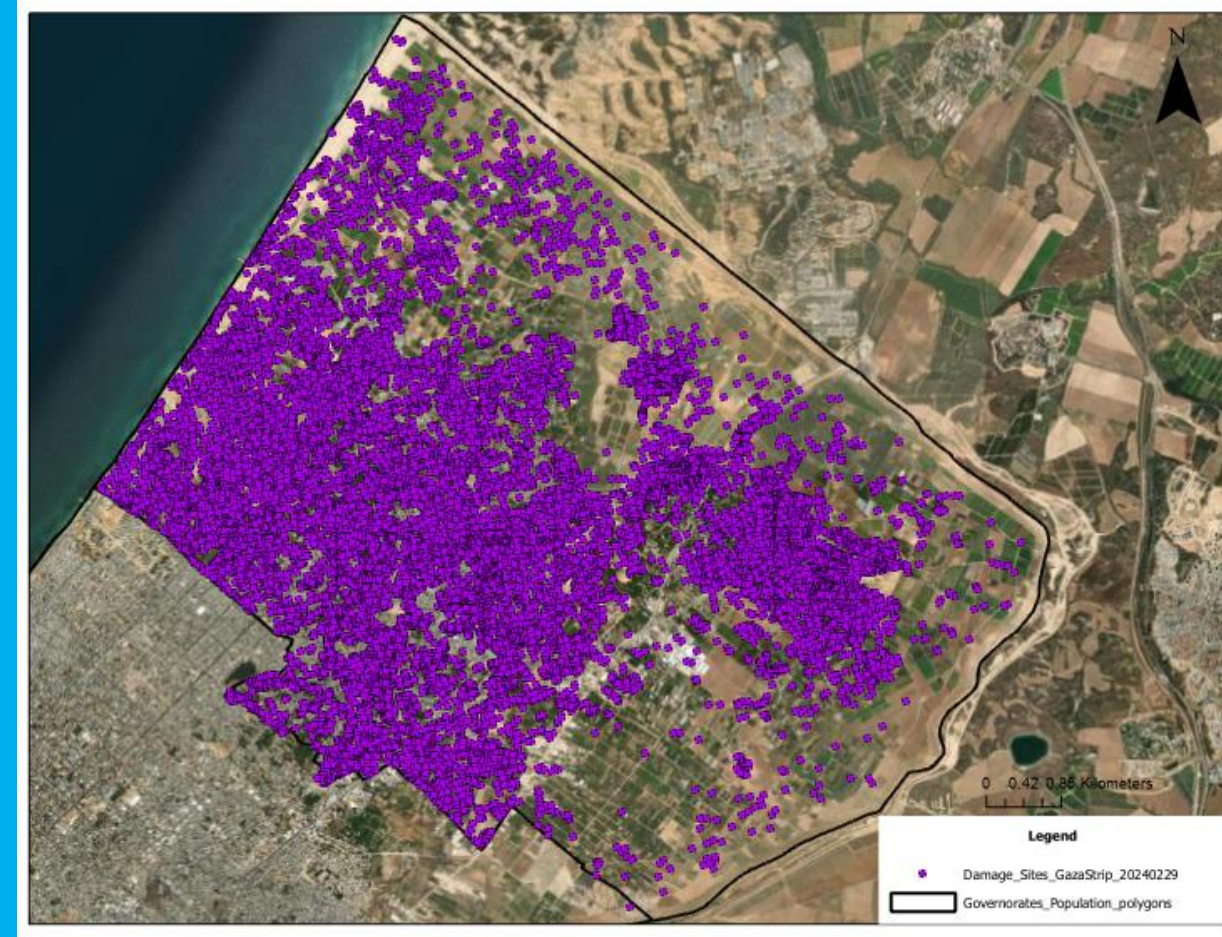


Distribution of school buildings and Damaged sites per governorate

North Gaza Governorate



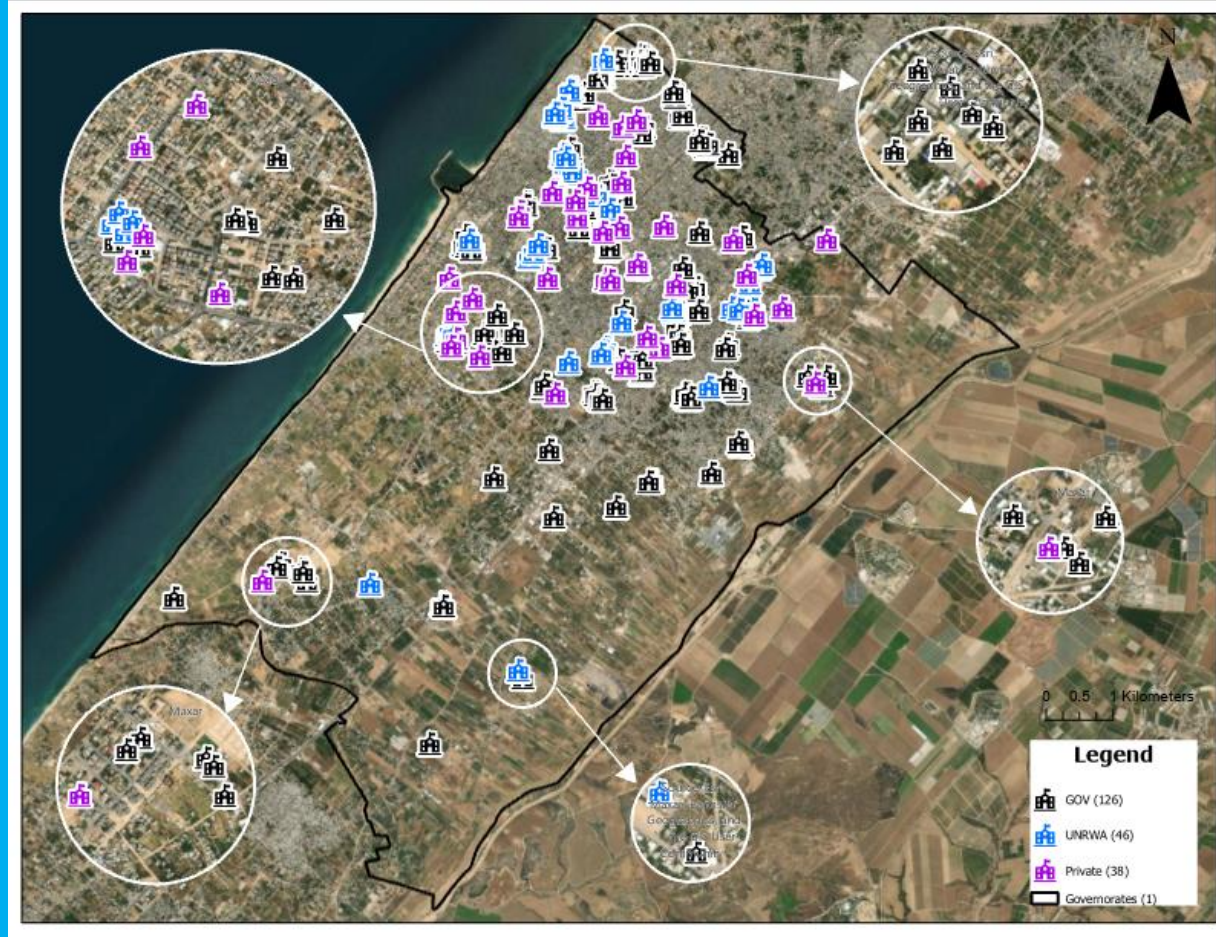
School buildings



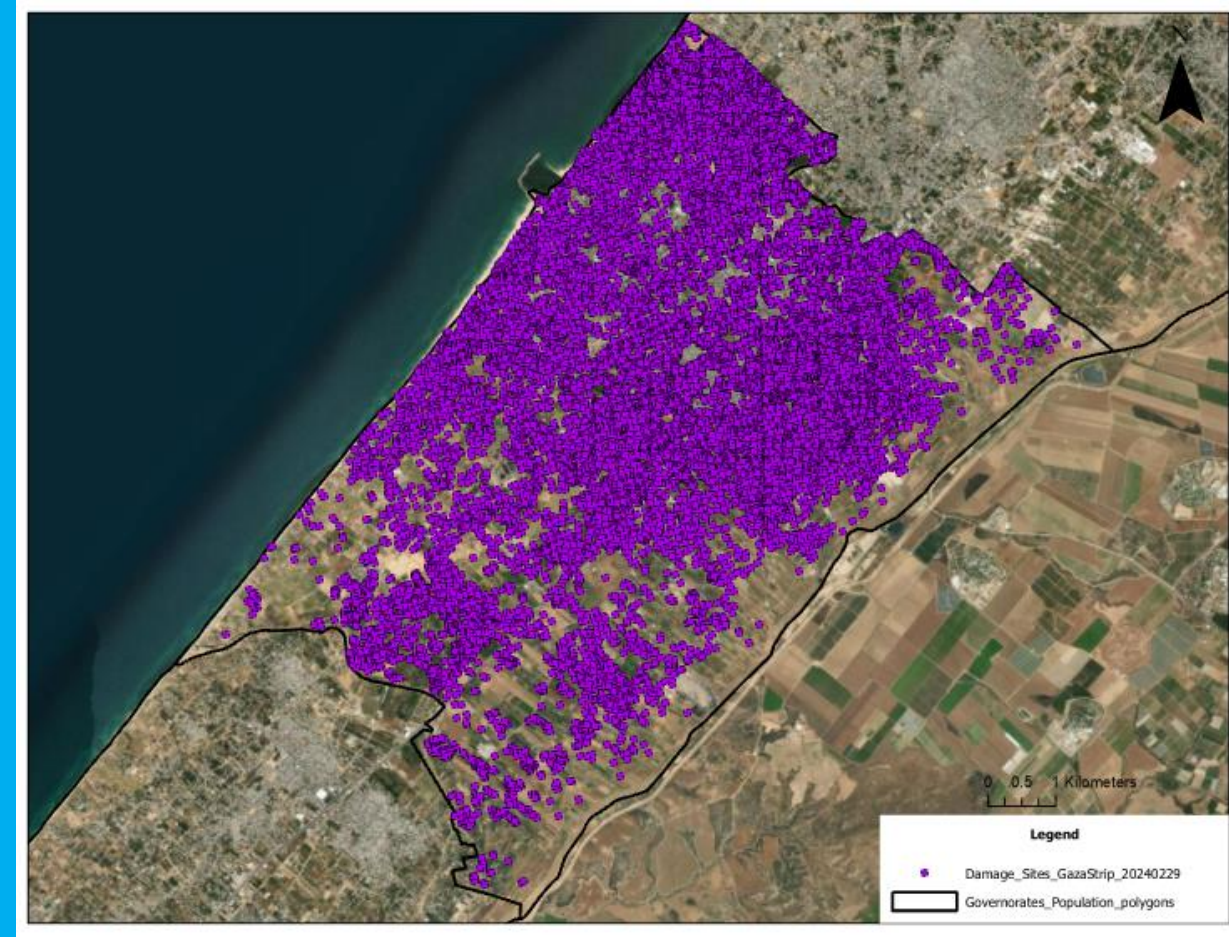
Damaged sites

Distribution of school buildings and Damaged sites per governorate

Gaza Governorate



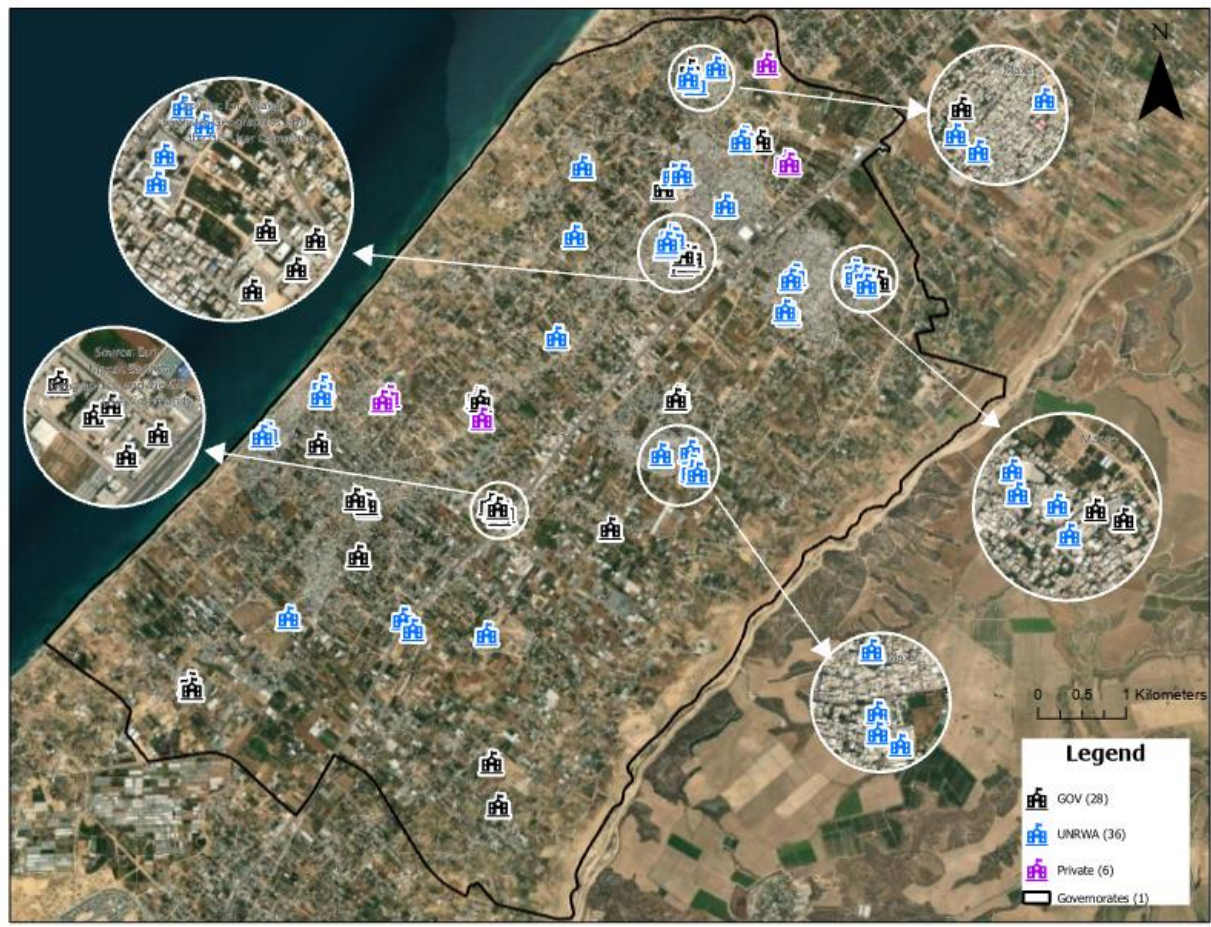
School buildings



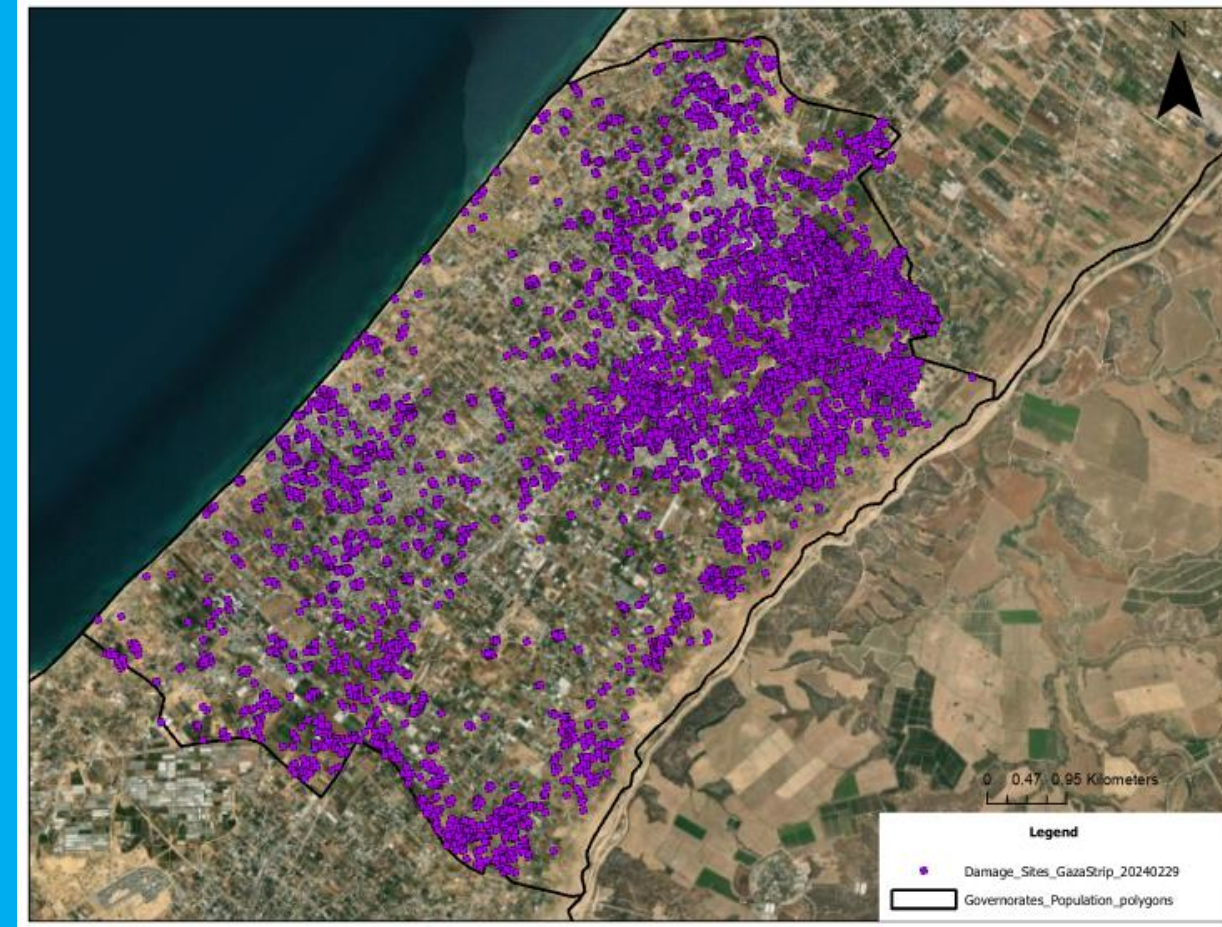
Damaged sites

Distribution of school buildings and Damaged sites per governorate

Middle Area Governorate



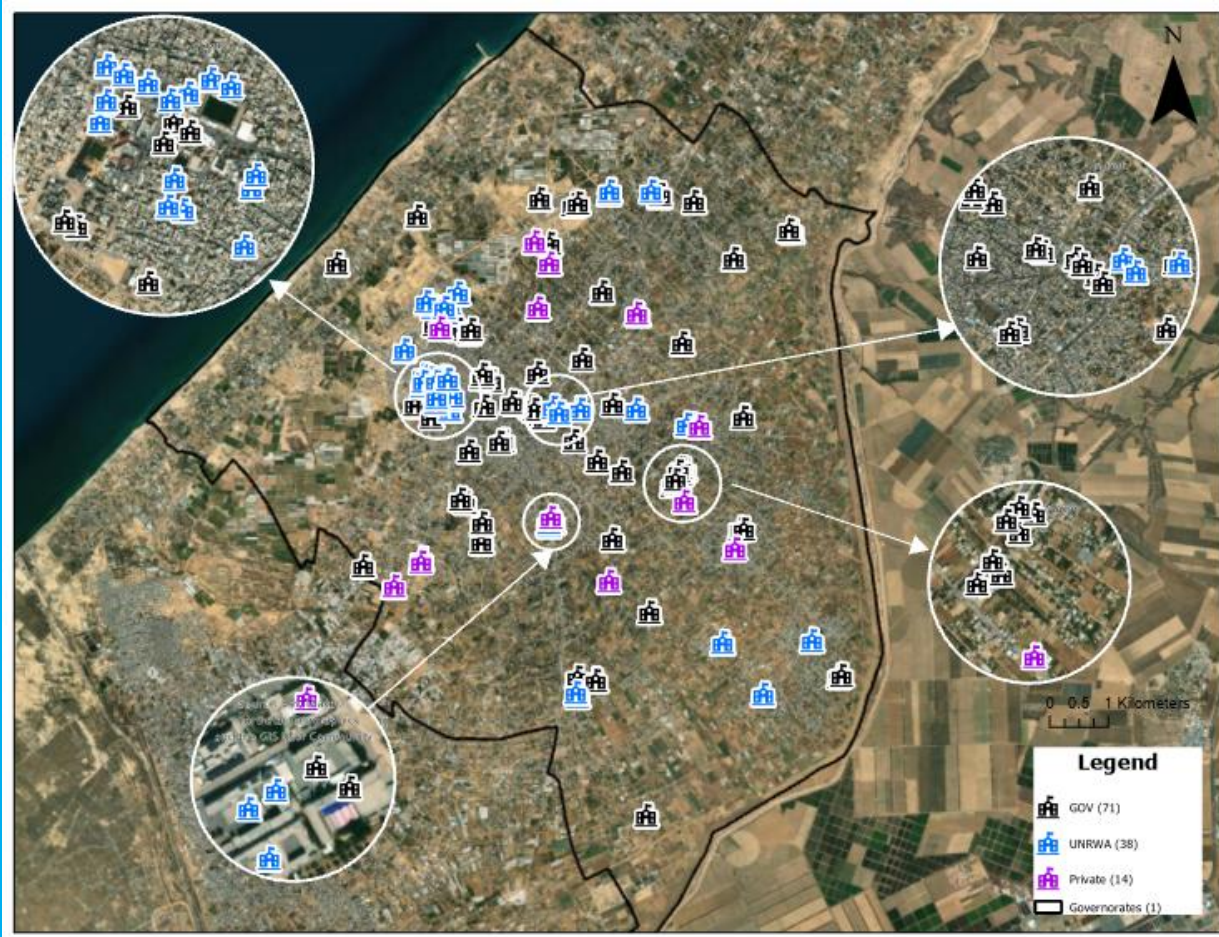
School buildings



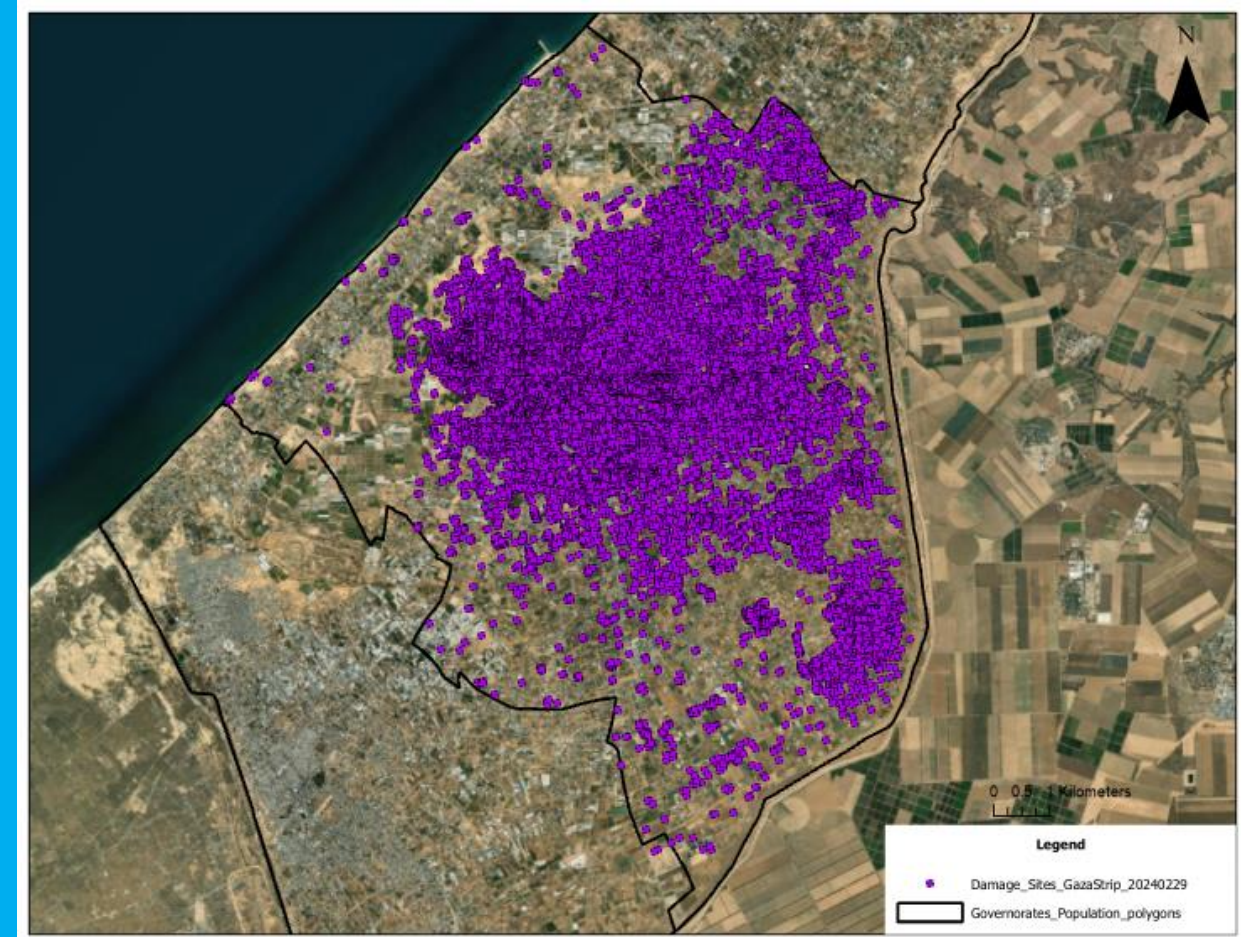
Damaged sites

Distribution of school buildings and Damaged sites per governorate

Khan Younis Governorate



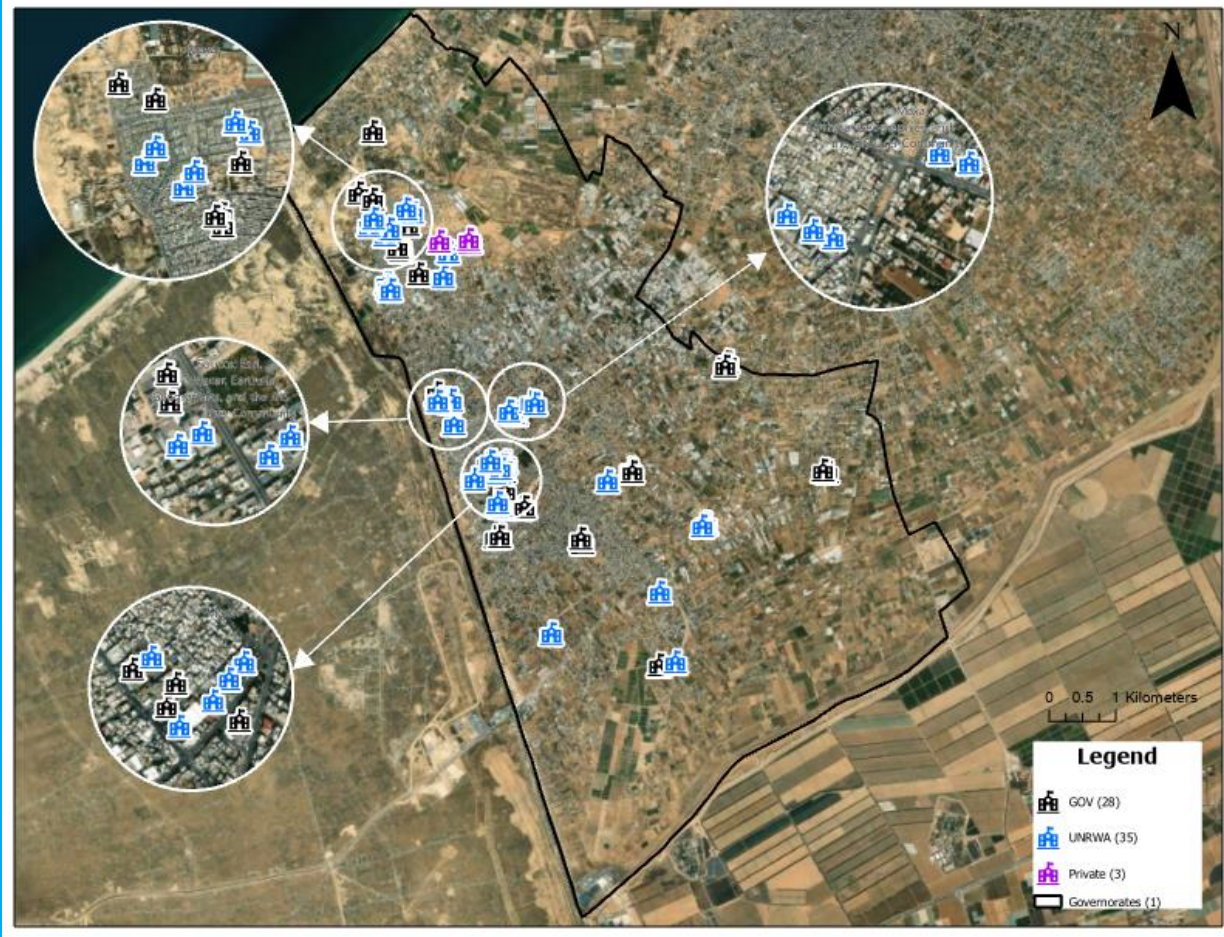
School buildings



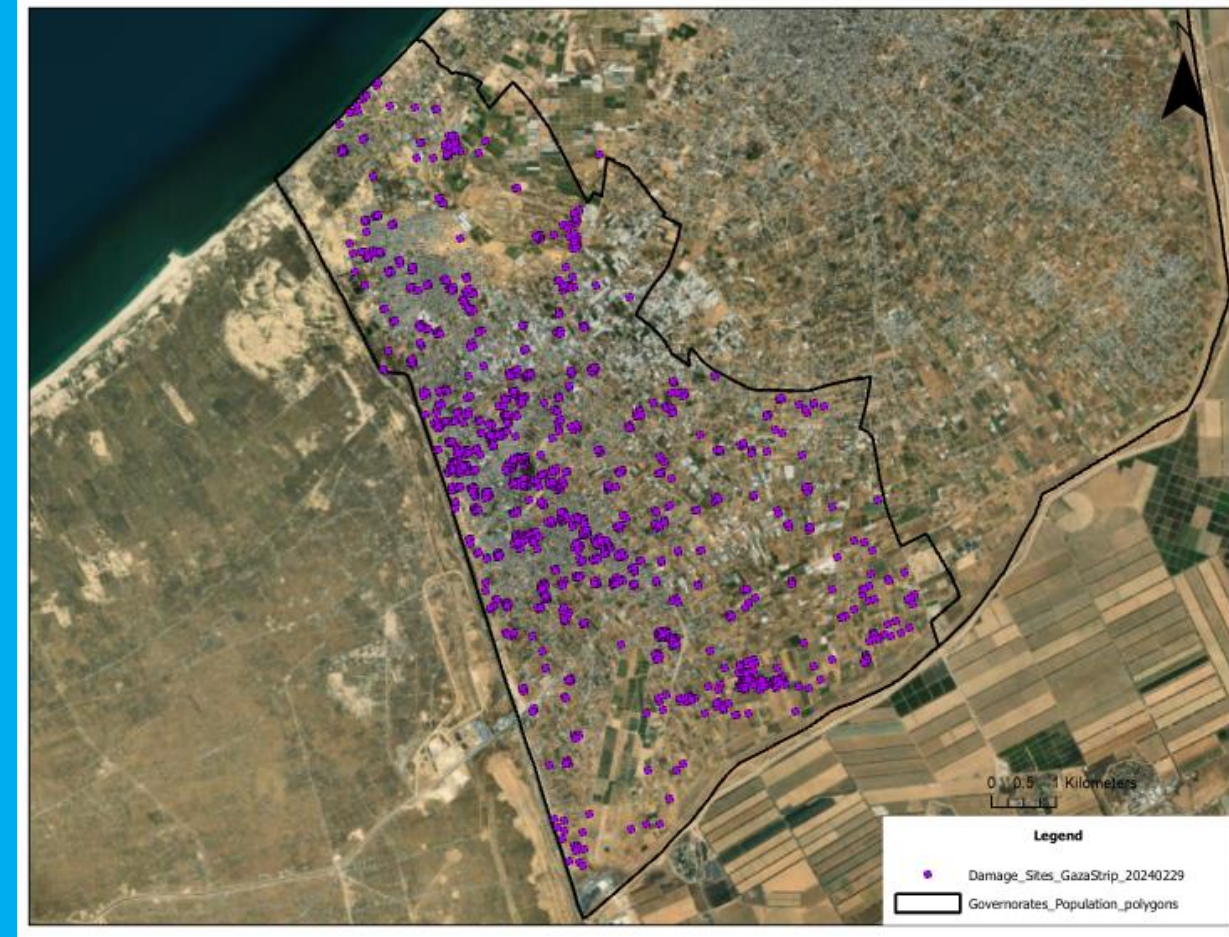
Damaged sites

Distribution of school buildings and Damaged sites per governorate

Rafah Governorate



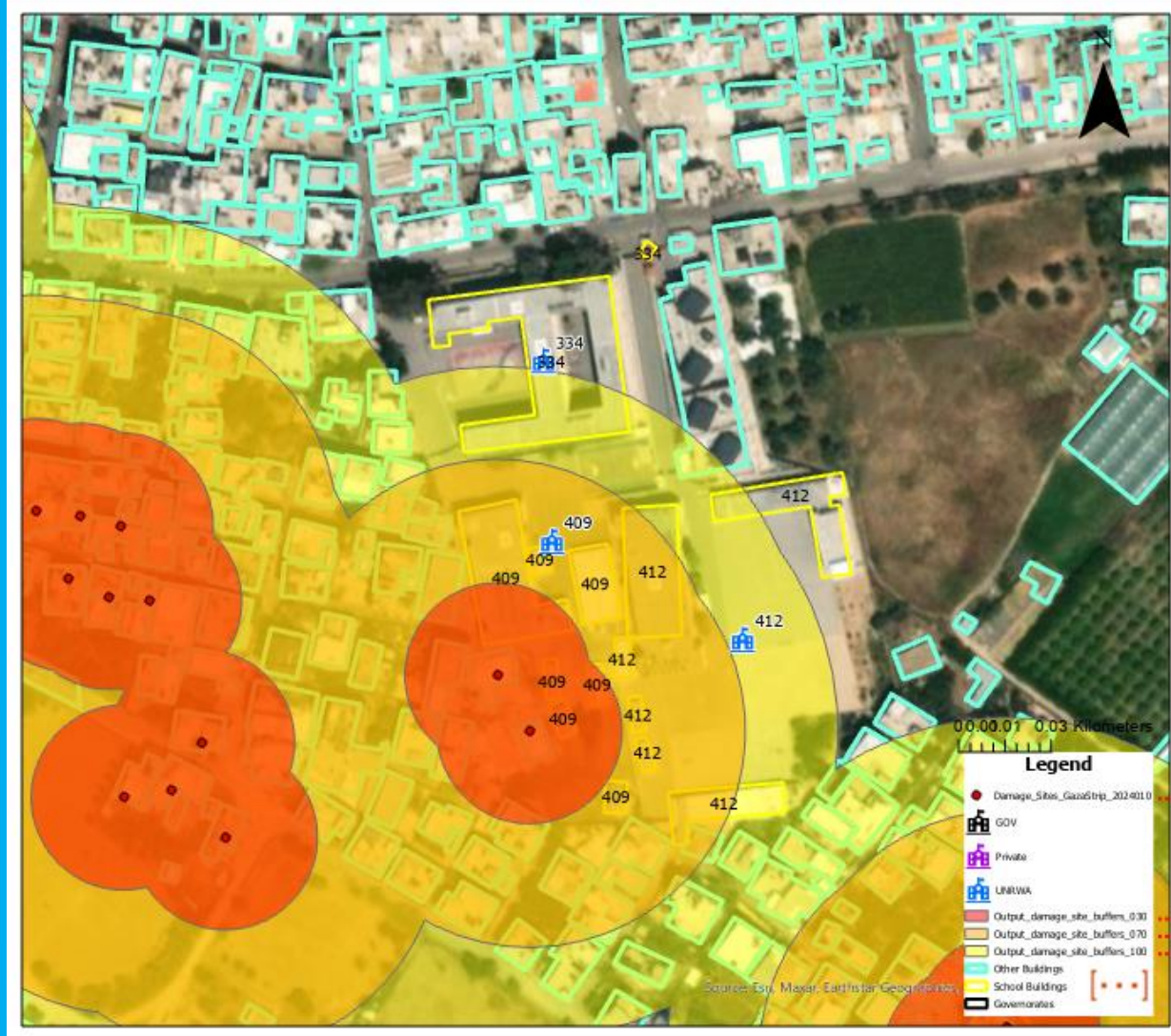
School buildings



Damaged sites

Building Footprints*

To represent schools using building footprints rather than points, to enhance the proximity analysis, the Assessment Team utilized Microsoft Building Footprints for the Gaza Strip which has 280,227 features as building footprints. Accordingly, the Assessment Team linked relevant building footprints to their respective schools.



* Building footprint is a polygon, representing a specific building structure in the physical world.

Remark

A hit within school premises but not directly to a building (for example: a hit to school playground) is classified under **Damaged** category.



Findings

- The assessment found that **212** school buildings have been **hit directly** since 7 October 2023, this represents **37.7%** (a +8.9% increase from the previous reporting period) of the total school buildings in Gaza.
- Satellite-derived analysis found that at least **53** schools were **Totally destroyed** (27 schools more compared to the previous reporting period). Another **38** schools lost at least half of its structures.

Probability of damage	Total (school buildings)	% (out of total school buildings)
Direct hit (at least one school building has been directly hit and at least one damaged school structure has been identified within school premises)	212	37.7%
Damaged (at least one damaged site has been identified within 30m of the school buildings. This could indicate severe damage to school structures)	167*	29.7%
Likely damaged (at least one damaged site has been identified within 30-70m of the school buildings. This could indicate moderate damage to school structures)	85	15.1%
Possible damage (at least one damaged site has been identified within 70-100m of the school buildings. This could indicate minor damage to school structures)	30	5.3%
Unknown (school buildings with no reported damage sites within 100m . This could indicate that school structures have not sustained damage)	69	12.2%
Total	563	

* 35 hits have been identified inside schools' boundaries (playgrounds), but have not hit school buildings, classified as "Damaged", See the previous slide.

Findings

- 63% of schools in Gaza share buildings and operate in a “double-shifting” system
- The difference in the number of affected school buildings and affected schools is due to the “double-shifting system”

Probability of damage	Total (school buildings)	# of schools (operate in these buildings)
Direct hit (at least one school building has been directly hit and at least one damaged school structure has been identified within school premises)	212	305
Damaged (at least one damaged site has been identified within 30m of the school buildings. This could indicate severe damage to school structures)	167	238
Likely damaged (at least one damaged site has been identified within 30-70m of the school buildings. This could indicate moderate damage to school structures)	85	130
Possible damage (at least one damaged site has been identified within 70-100m of the school buildings. This could indicate minor damage to school structures)	30	43
Unknown (school buildings with no reported damage sites within 100m . This could indicate that school structures have not sustained damage)	69	97
Total	563*	813

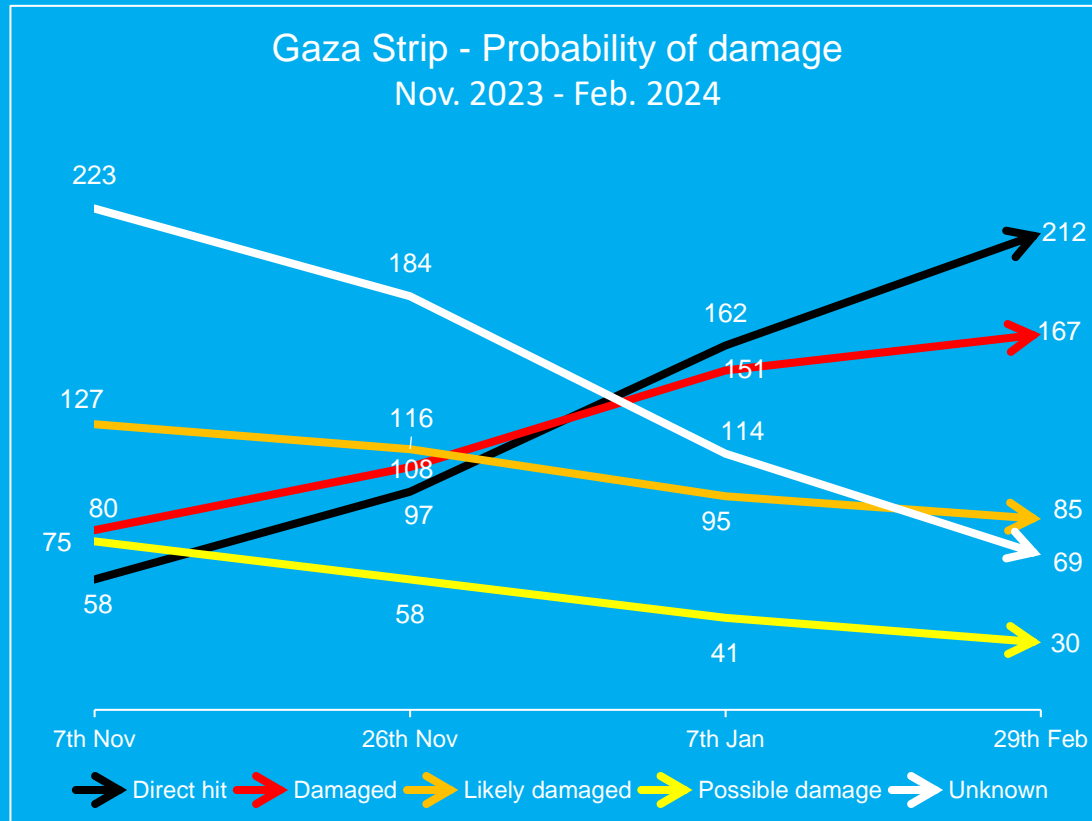
* Number of school buildings includes 9 new buildings (final stage of construction)

Findings (damage per Governorate)

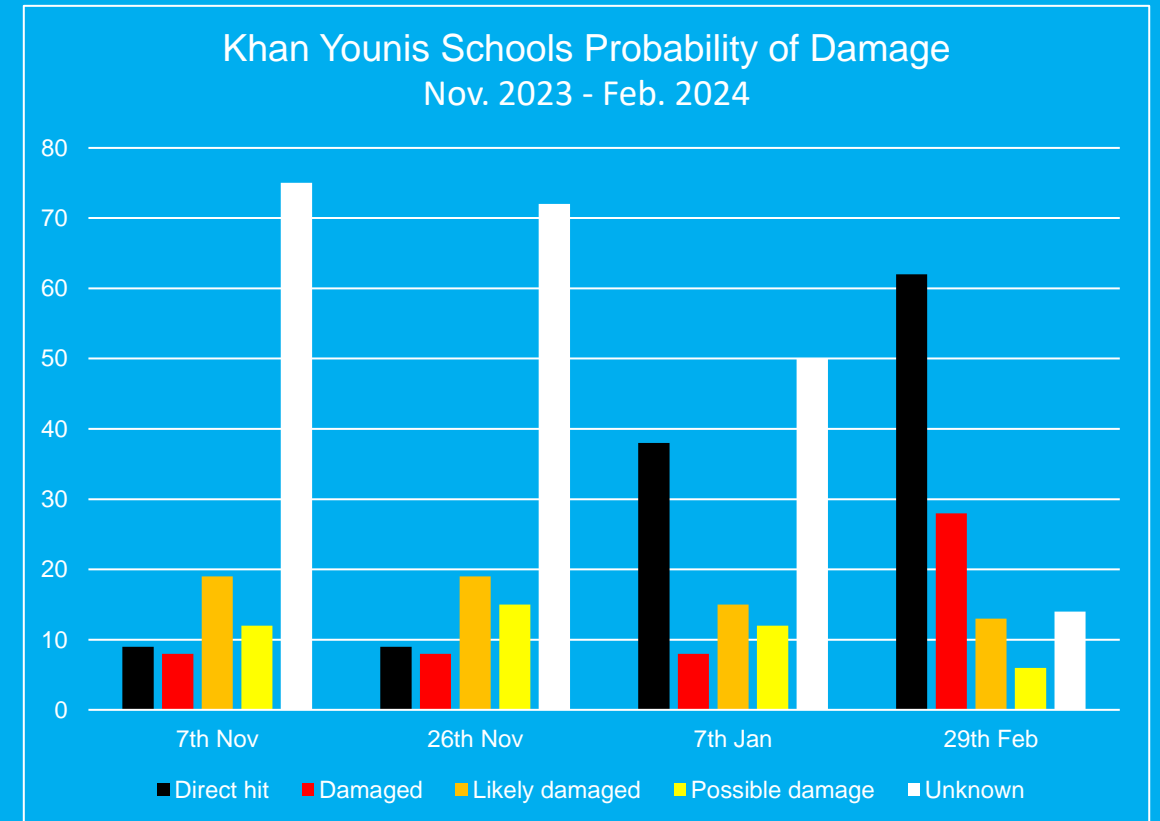
Probability of damage	North Gaza	Gaza	Middle Area	Khan Younis	Rafah	Total (school buildings)
Direct hit (at least one school building has been directly hit and at least one damaged school structure has been identified within school premises)	42	94	14	62	-	212
Damaged (at least one damaged site has been identified within 30m of the school buildings. This could indicate severe damage to school structures)	39	77	13	28	10	167
Likely damaged (at least one damaged site has been identified within 30-70m of the school buildings. This could indicate moderate damage to school structures)	11	29	20	13	12	85
Possible damage (at least one damaged site has been identified within 70-100m of the school buildings. This could indicate minor damage to school structures)	2	6	11	6	5	30
Unknown (school buildings with no reported damage sites within 100m . This could indicate that school structures have not sustained damage)	-	4	12	14	39	69
Total	94	210	70	123	66	563

Trends

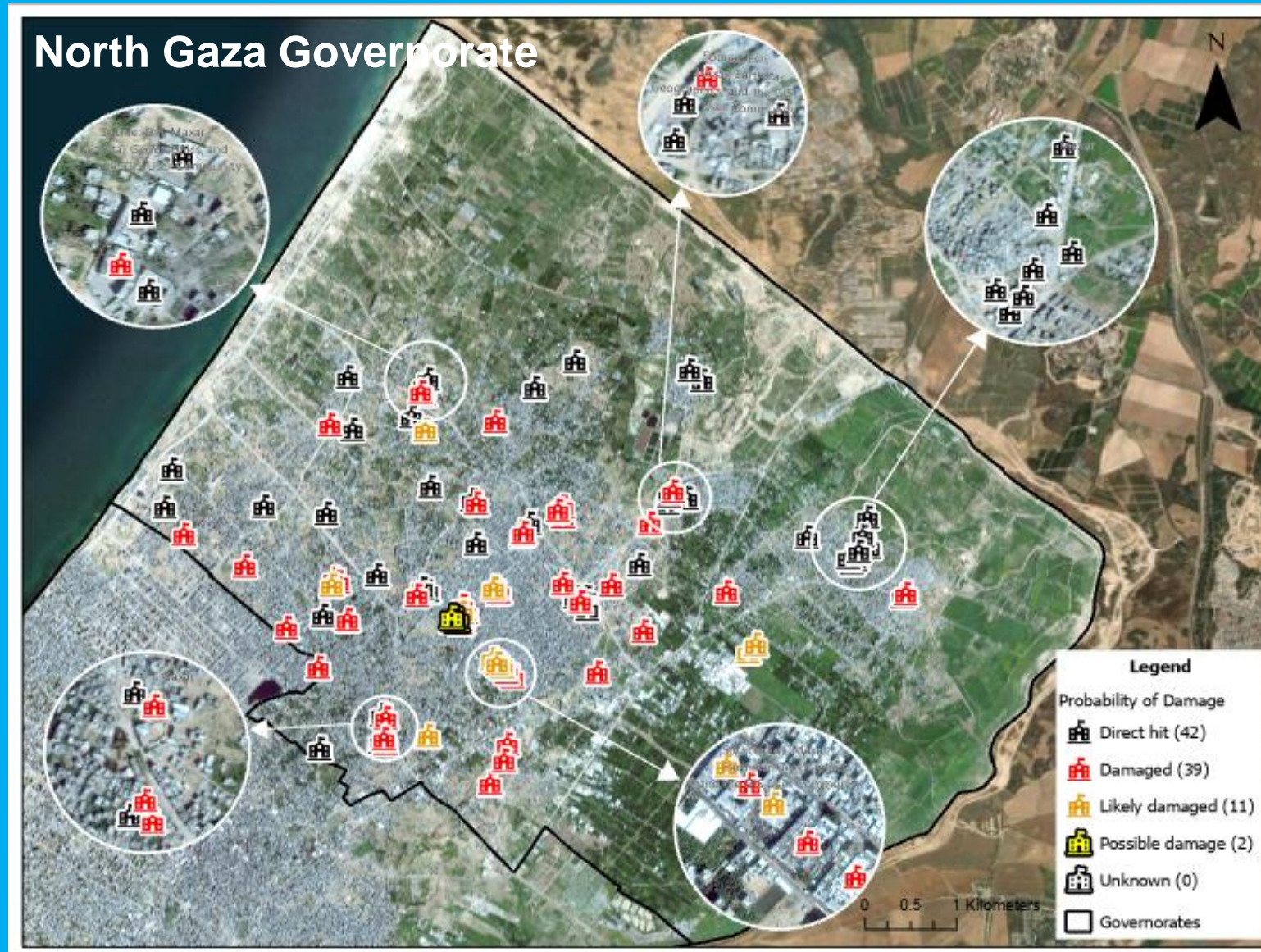
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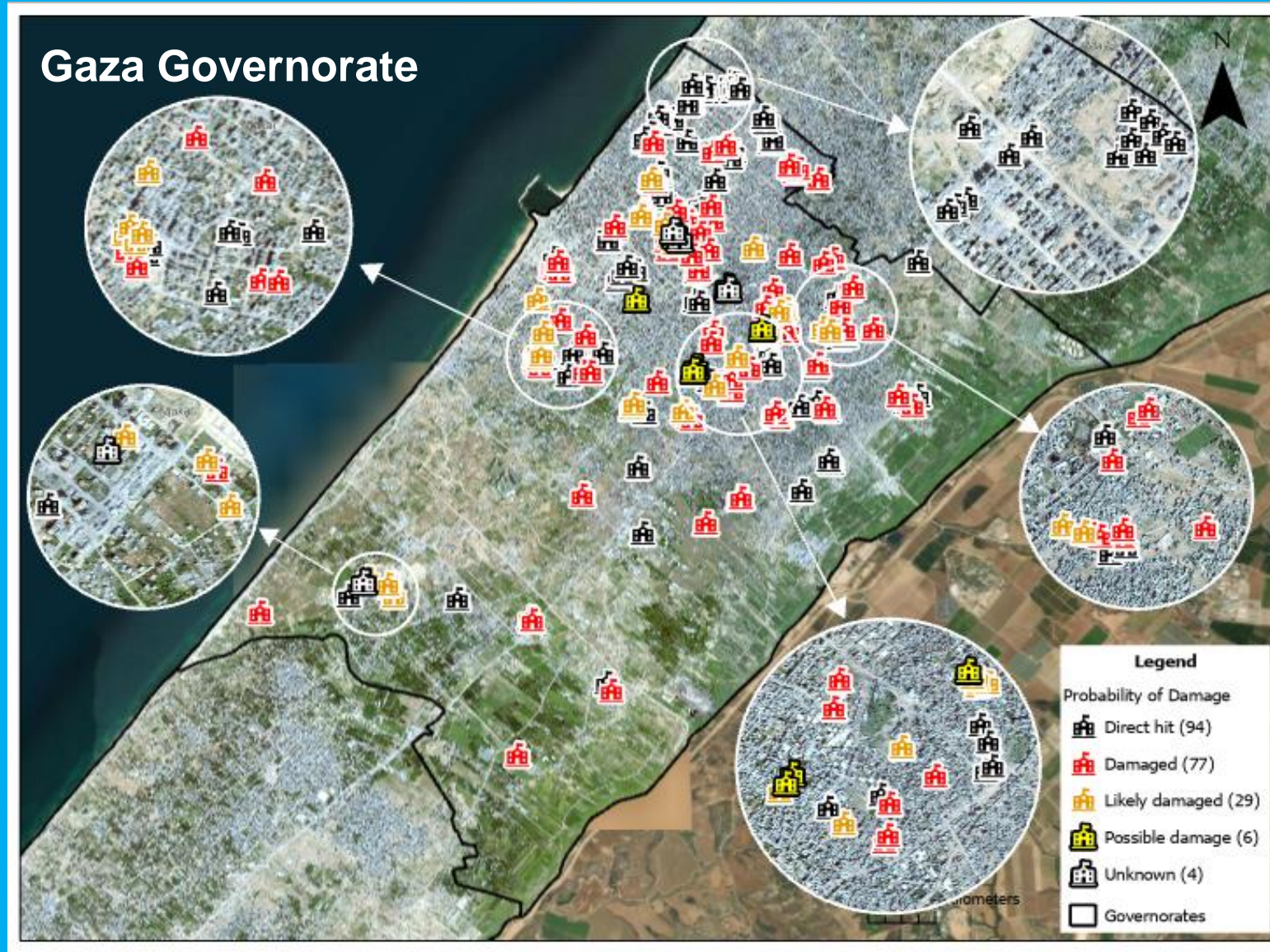
- Since the last damage analysis on the 7th of January, an additional **66** school buildings have been classified as **Directly hit (28)** or **Damaged (38)**, 44 of them are in the **Khan Younis governorate**.



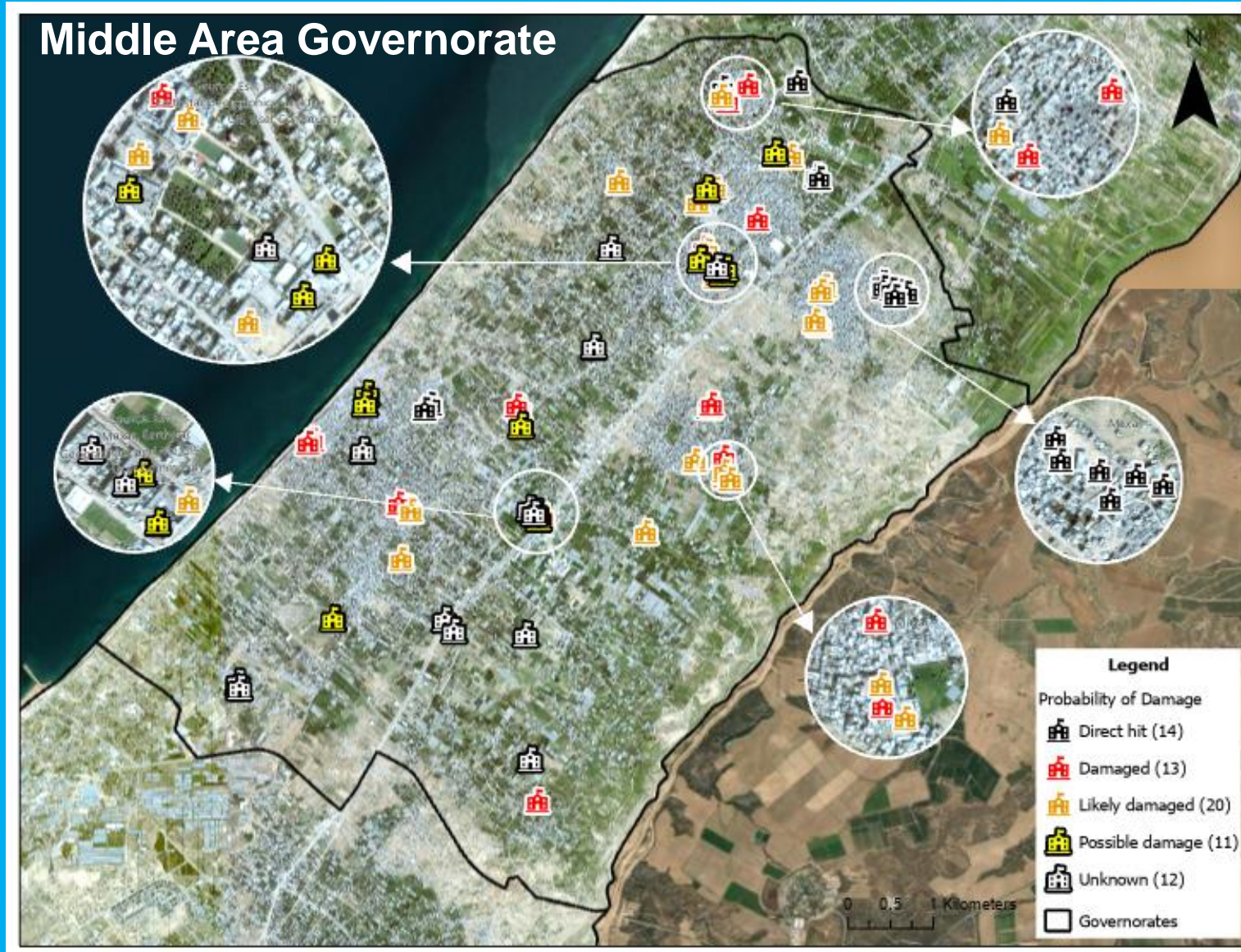
Findings (damage per Governorate)



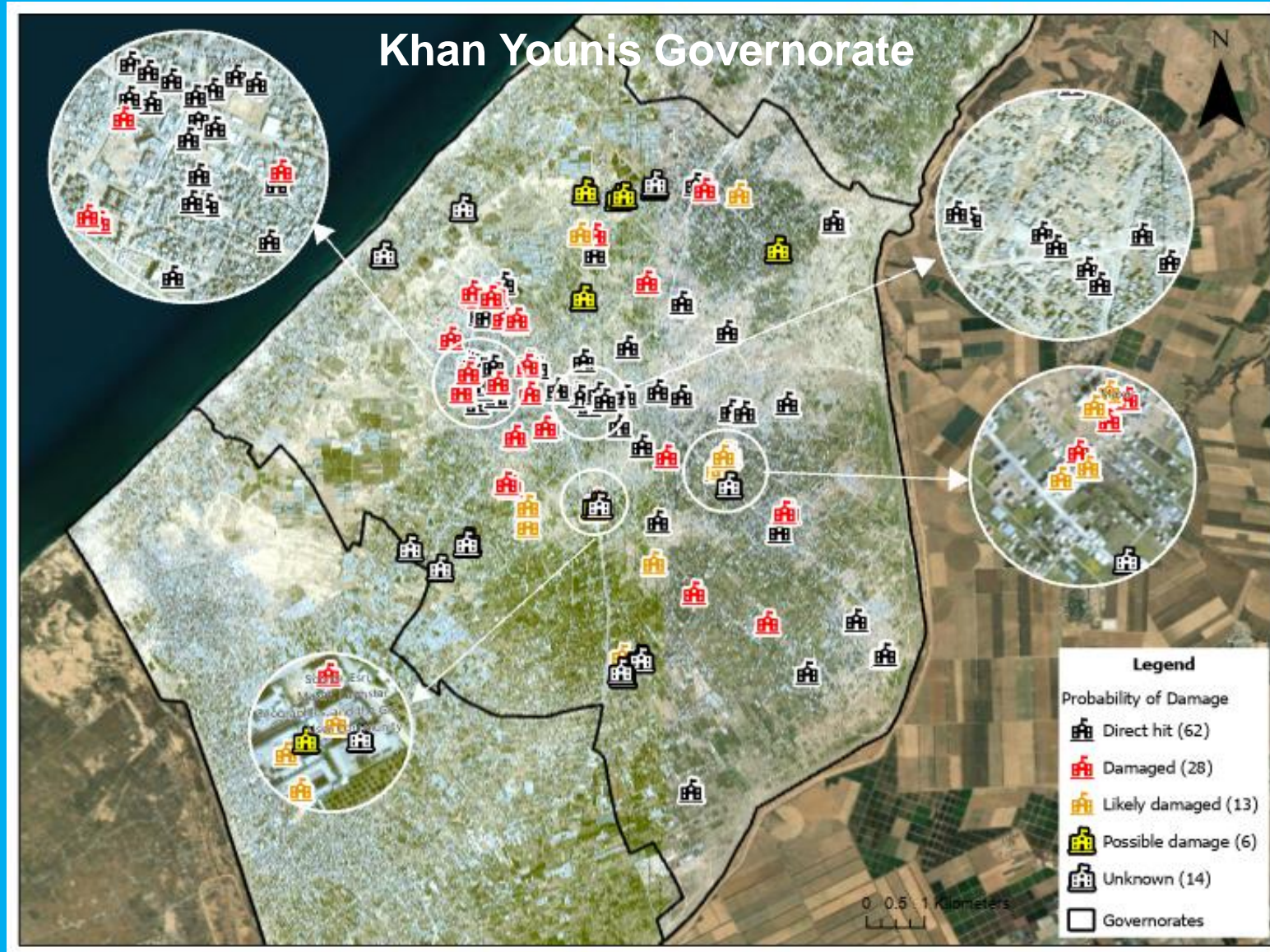
Findings (damage per Governorate)



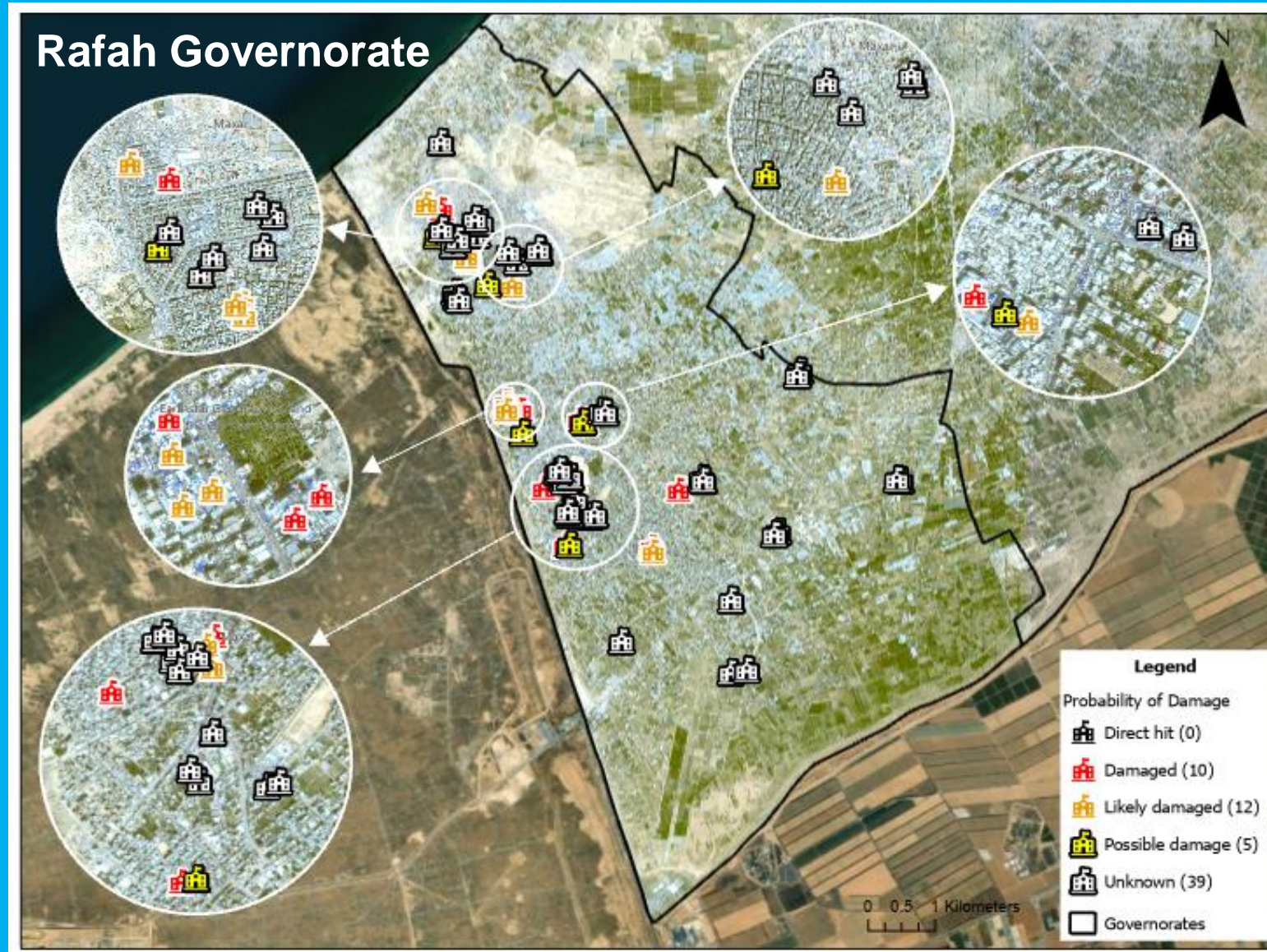
Findings (damage per Governorate)



Findings (damage per Governorate)



Findings (damage per Governorate)

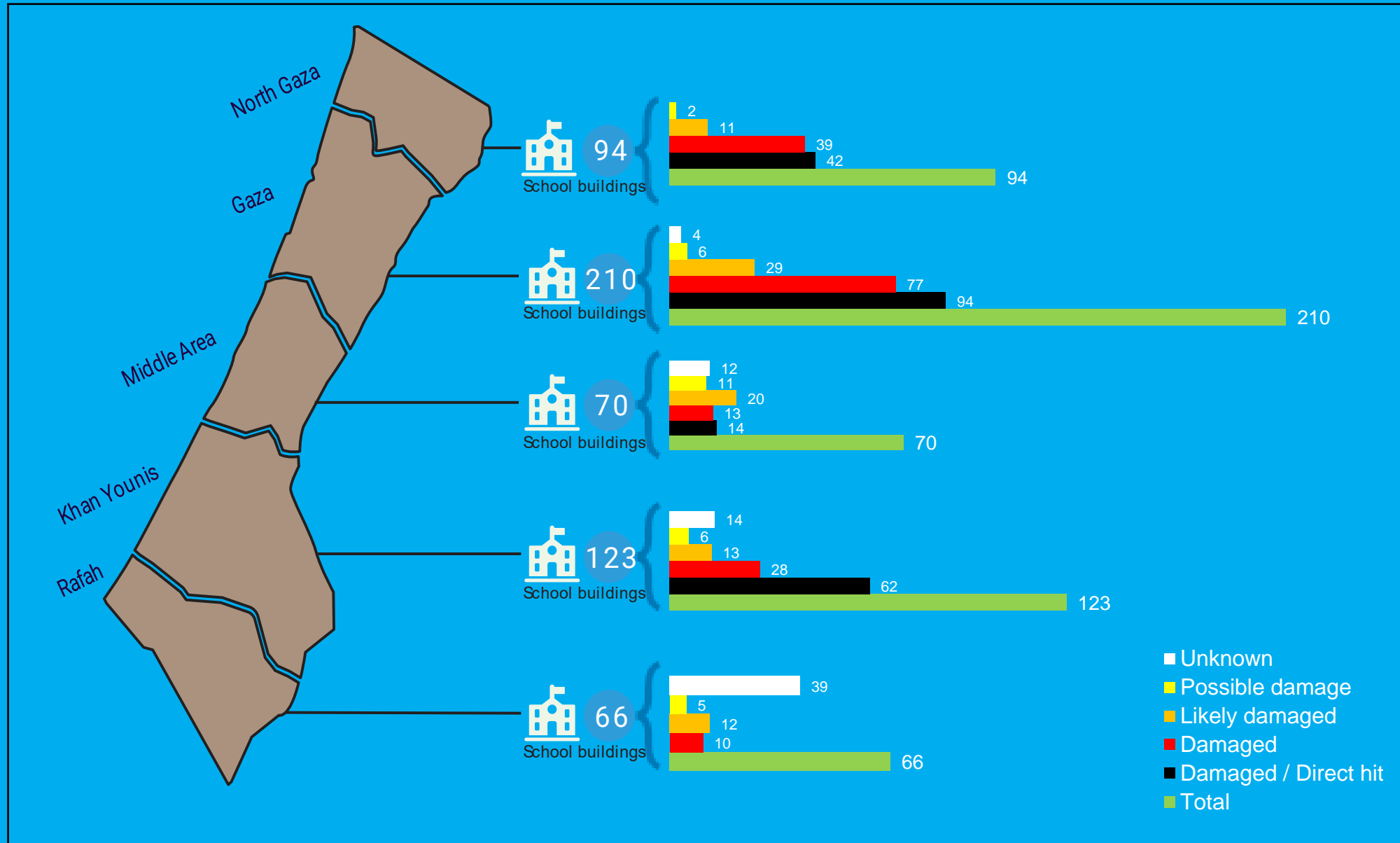


Findings (damage per Governorate)

North Gaza governorate is the most affected with **86.2%** of its school buildings being either directly hit or **damaged**.

followed by Gaza governorate with **81.5%** of its total school buildings.

While **73.2%** of Khan Younis governorate school buildings are directly hit.



Findings (damage per Type)

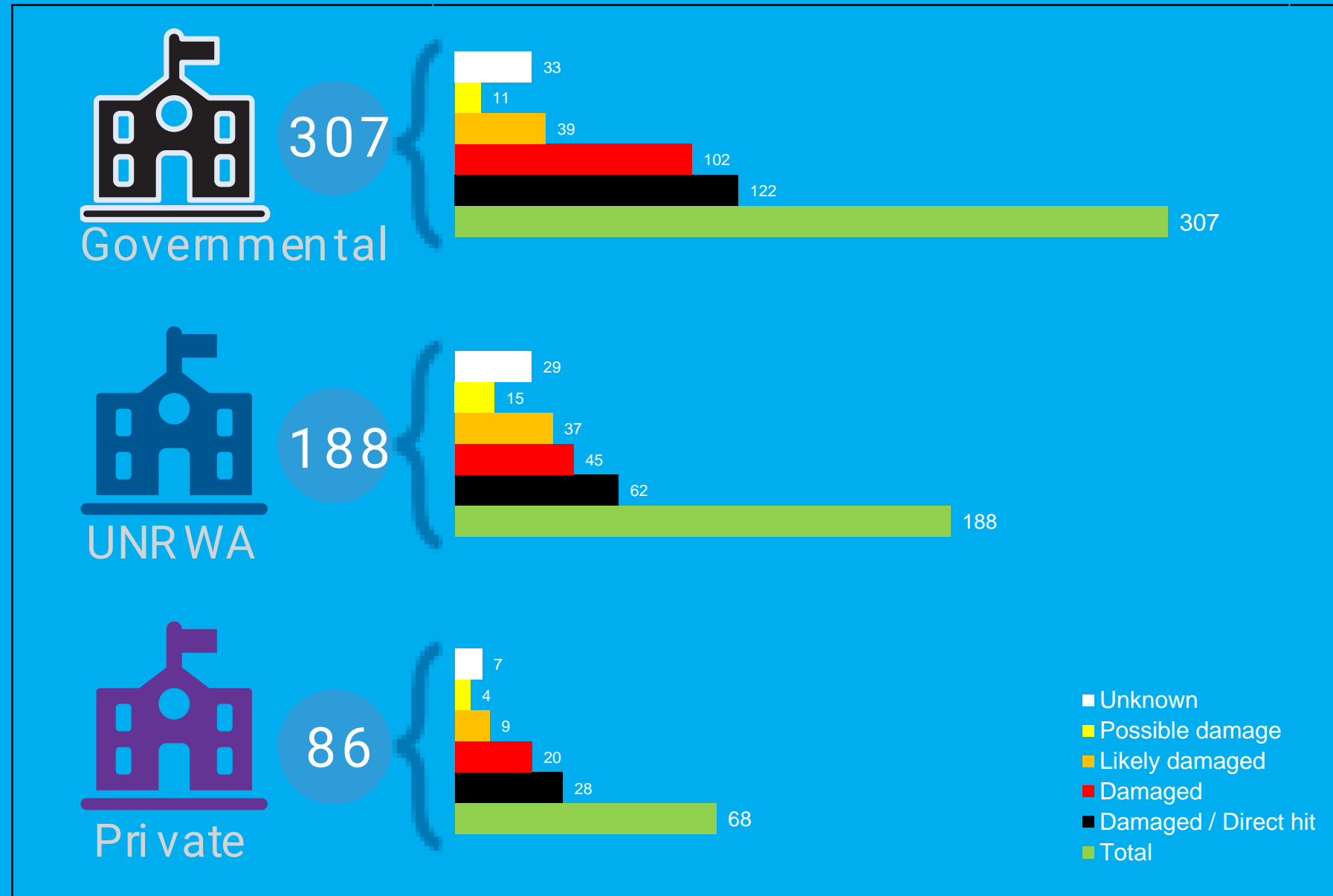
Probability of damage	Government	UNRWA	Private	Total (school buildings)
Direct hit (at least one school building has been directly hit and at least one damaged school structure has been identified within school premises)	122	62	28	212
Damaged (at least one damaged site has been identified within 30m of the school buildings. This could indicate severe damage to school structures)	102	45	20	167
Likely damaged (at least one damaged site has been identified within 30-70m of the school buildings. This could indicate moderate damage to school structures)	39	37	9	85
Possible damage (at least one damaged site has been identified within 70-100m of the school buildings. This could indicate minor damage to school structures)	11	15	4	30
Unknown (school buildings with no reported damage sites within 100m . This could indicate that school structures have not sustained damage)	33	29	7	69
Total	307	188	68	563

Findings (damage per Type)

73% (224) of Governmental school buildings have been either directly hit or damaged.

57% (107) of UNRWA school buildings have been either directly hit or damaged.

55.8% (48) of Private school buildings have been either directly hit or damaged.



- **Students and Teachers:**

- The 212 school buildings classified as **Direct hit** previously served some 228,000 students and more than 8,550 teachers.
- The 167 school buildings classified as **Damaged** previously served some 173,000 students and more than 6,700 teachers.

- **Military use of schools**

- The satellite-derived images provide evidence for military use of schools.

- **School buildings being used as IDP shelters:**

- Since the 7th of October, more than 320 school buildings have been used by IDP as shelters, the assessment results show that out of those school buildings, 188 are either **Directly hit** (90) or **Damaged** (98).

Findings

- **166 out of the 212 schools Directly Hit in the Gaza Strip** are in the area targeted by the Evacuation Orders by the Israeli military.
- **All schools classified as Directly Hit in Khan Younis governorate (62 schools)** are in the area targeted by the Evacuation Orders by the Israeli military
- **76 out of the 94 schools Directly Hit in the Gaza governorate** are in the area targeted by the Evacuation Orders by the Israeli military.



- This Satellite-derived Damage verification exercise **confirmed** the large level of damage to schools previously reported by the cluster in Gaza.
- This exercise indicates that 82.5% of schools sustained some level of damage to their buildings, this includes **Direct hit, Damaged, and Likely damaged.**
- At least **67%** of schools in Gaza will either need full reconstruction or major rehabilitation work to be functional again.
- **Almost 30%** of directly hit and damaged schools are UN-run schools through UNRWA.
- **59%** of school buildings that have been used by IDP as shelters are either Directly hit or Damaged.
- Since the beginning of the escalation, the Education Cluster has been receiving several concerning reports, pictures, and videos, showing that schools are being used for military operations by Israeli Security Forces (ISF) including use as detention, interrogation centers, and military bases. The satellite-derived images provide further evidence for the **military use of schools.**

Call to Action to the Parties to the Conflict:

- To cease fire immediately.
- To take all possible measures, as required under international humanitarian law, to safeguard schools, so they can be used for educational purposes and remain safe.
- To recognize the right of children to learn as set out in the Convention on the Rights of the Child including during emergencies as set out in UN Resolution 64/290 of 2010.

Call to Education Service Providers:

- To prepare to resume appropriate education activities once the conflict ends. In doing so, paying close attention to children's psychosocial, cognitive, physical health and wellbeing development.
- To prepare and implement alternative learning solutions – such as distance learning or learning in non-formal settings - for children to continue learning.

Call to Action to Donors:

- To recognize the catastrophic damages to the education system in Gaza.
- To advocate for a long-term ceasefire and the stop of the war, and advocate for safeguarding of schools, so they can be used for educational purposes and remain safe for children.
- To ensure that the funds needed to support the immediate education requirements, as well as the long-run reconstruction of the education structures, are provided.

Findings: Military use of school premises

Satellite imageries from February 2024 show military use of school premises including military tracks and activity and heavy military tanks present inside school premises.



Military tanks present inside the school

Findings: Military use of school premises



Military tanks present inside the school

Findings: Military use of school premises



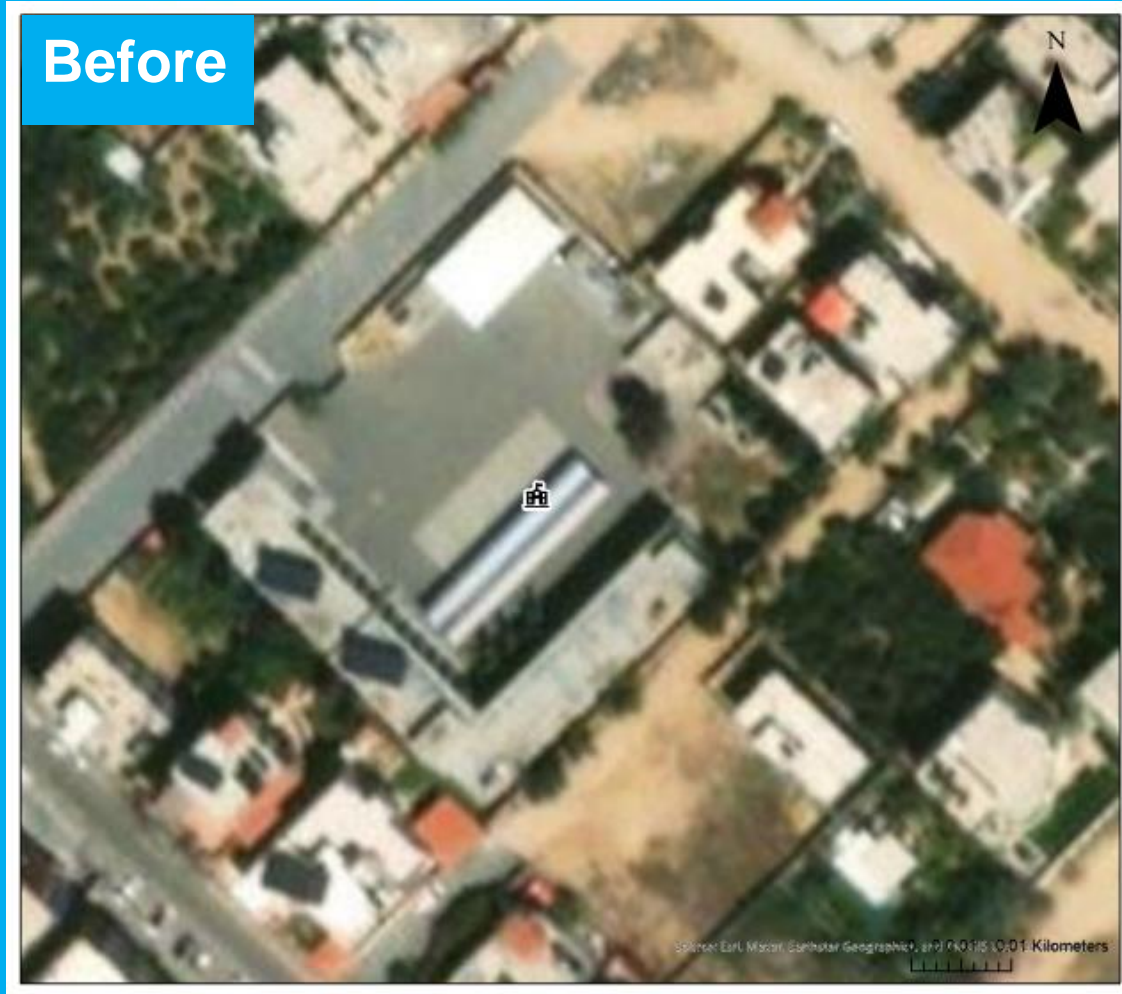
Military tanks, vehicles, and bulldozer present inside the school

Findings: Military use of school premises



Military tracks and activity

Findings: Military use of school premises



Impact crater

Findings: Military use of school premises



Destroyed buildings, Military tracks and activity, and Impact crater

Findings: Schools as IDP Shelters



Khan Younis Governorate



Snapshots

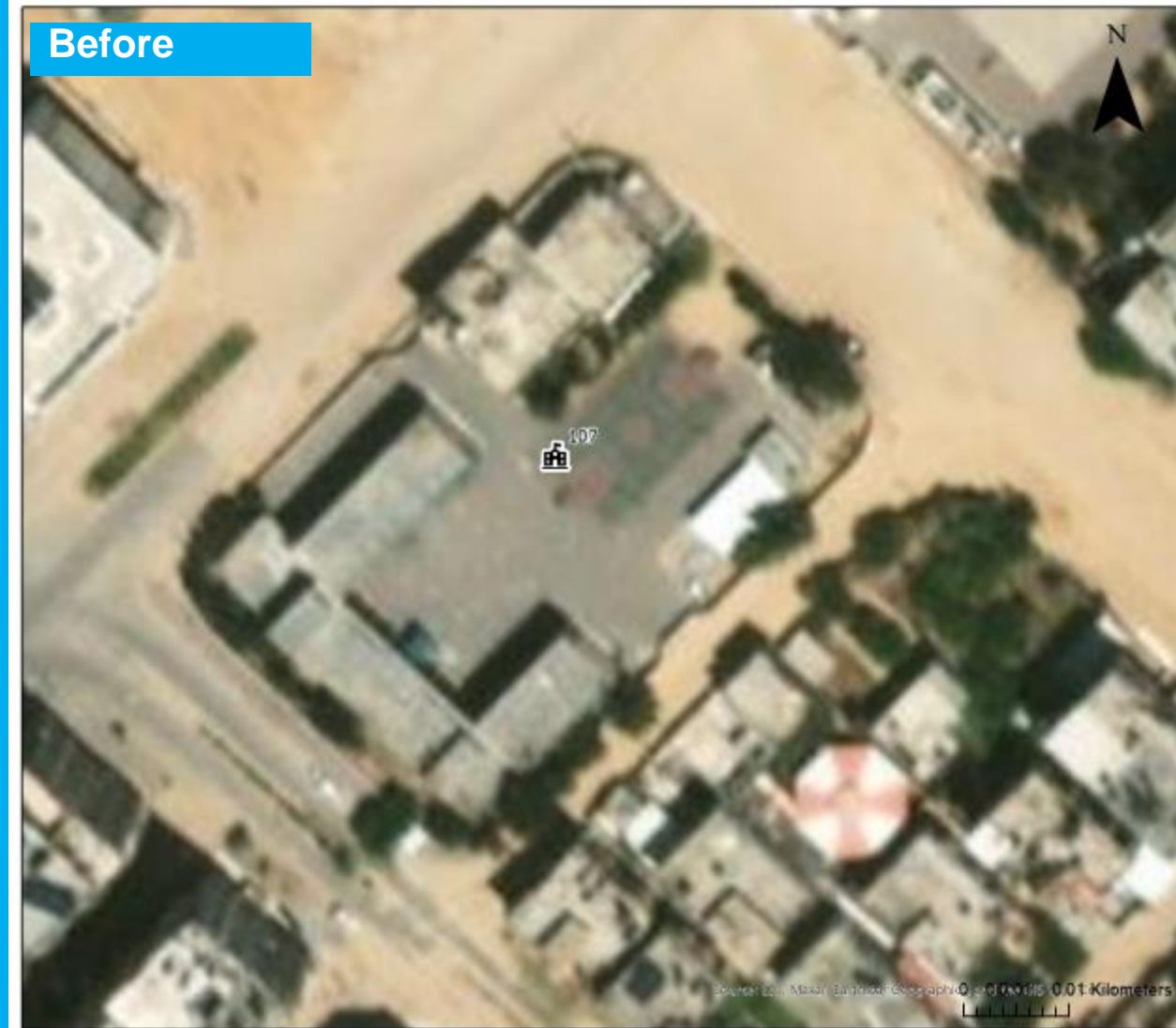


* Jules & Abu Thar Al Ghaffari & Sami Al Alamiy & Al Taqoa & Sarafand & Asdoud & Al Zahawi Schools - Gaza/An Naser



* Osama Al-Najjar Basic Girls School & Ahmed Ibn Abed Al Azeez Basic Boys School - Khan Younis/Jourat Al-Loot

Before



After



* Khaled Alalma Basic Boys School - Gaza/An Naser

Before



After



* Wafaa Al Amear School - Juhor ad Dik/Al Wadi

Before



After



* Al Manama Basic Boys School - Beit Lahiya/Mashroo Amer wal Isra'a

Before



After



* Subhi Abo Karch & Al Awqaf Al Shariah Boys & Beit Dagan Basic & Shuhada Al Shojaeya & Ahmed Al Jabari Schools - Ash Shuja'iyeh - Ijdeedeh

Before

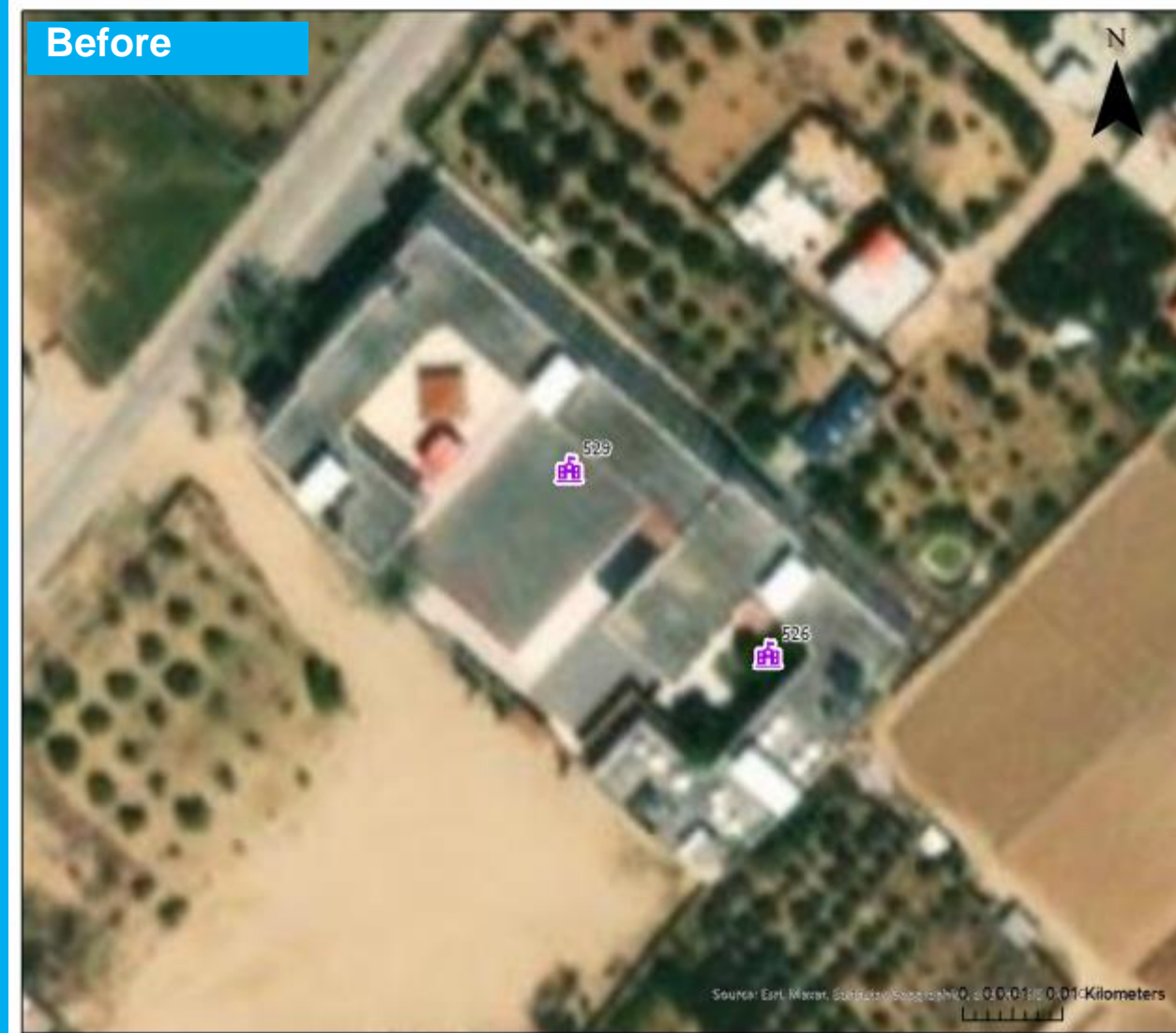


After



* Shuhada Al Mountar & Moueen Bseiso & Al Abbas Ibn Abd Al-Muttalib & Al Shejaeya Secondary Girls & Al Shejaeya Basic Girls Schools - Gaza/At Turukman - Ijdeedeh

Before



After



- Al Imam Mohammed Al Ethaimeen Private School for Boys & Al Imam Mohammed Al Ethaimeen Private School for Girls
- Khan Younis - Al Qarara/Al Qarara (south)

Before



After



* Zahraa Al Madaean Secondary Girls School - Gaza/An Naser

Before



After



* Al-Ma'ari Basic Boys & Al-Ma'ari Secondary Girls and Al-Ma'ari Basic Co-education Schools
- Khan Younis - Al Qarara

Before



After



* Al Shaheed Abo Hmead Schools - Khan Younis/Al Mahattah

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SCAN ME 

