



Occupied  
Palestinian Territory  
Education Cluster

# Verification of damages to schools

based on proximity to damaged sites

Gaza, Occupied Palestinian Territory

10 February 2024



# 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.
- As of the end of January 2024, the EC reports through its mechanism, that 386 school buildings sustained damages representing more than 78% of all school buildings in Gaza (25 schools fully damaged, 113 severely damaged, 125 with moderate damages, and 123 with minor damages).

# 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 validate and verify the initial school damage data, which the cluster has been collecting since 7 October.
- To better understand the situation of school buildings and the severity of damage, especially in areas with limited field access.
- To help in developing 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.

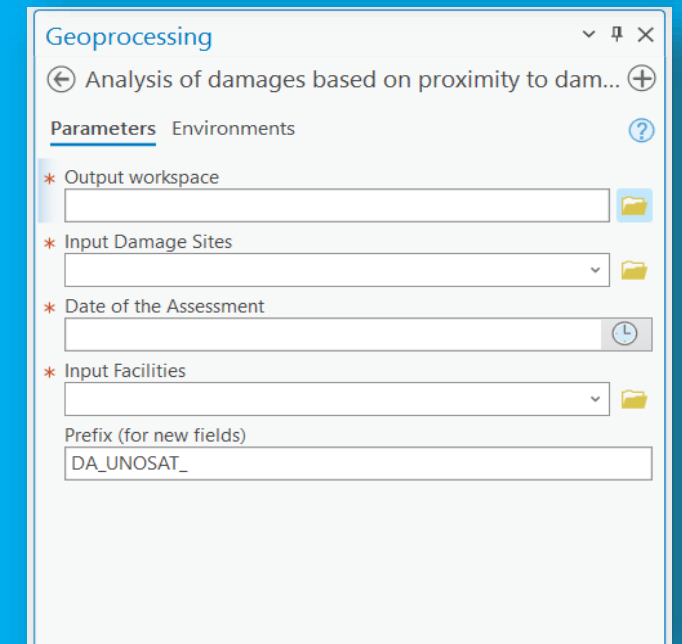
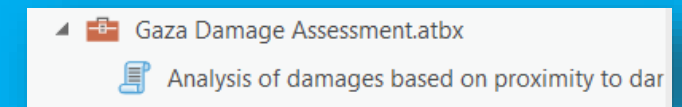
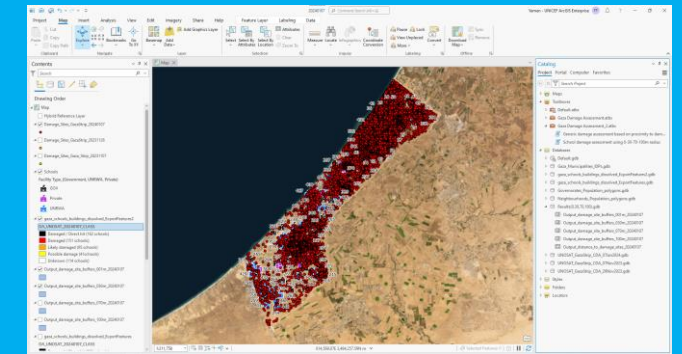
# Methodology

- **Tools:**

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

- **Sources:**

- UNOSAT damage assessments:
  - Damage\_Sites\_GazaStrip\_20240107
- Satellite Imagery:
  - 15 December 2023 WorldView-3 © Maxar 2023
- 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 km<sup>2</sup>), 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).

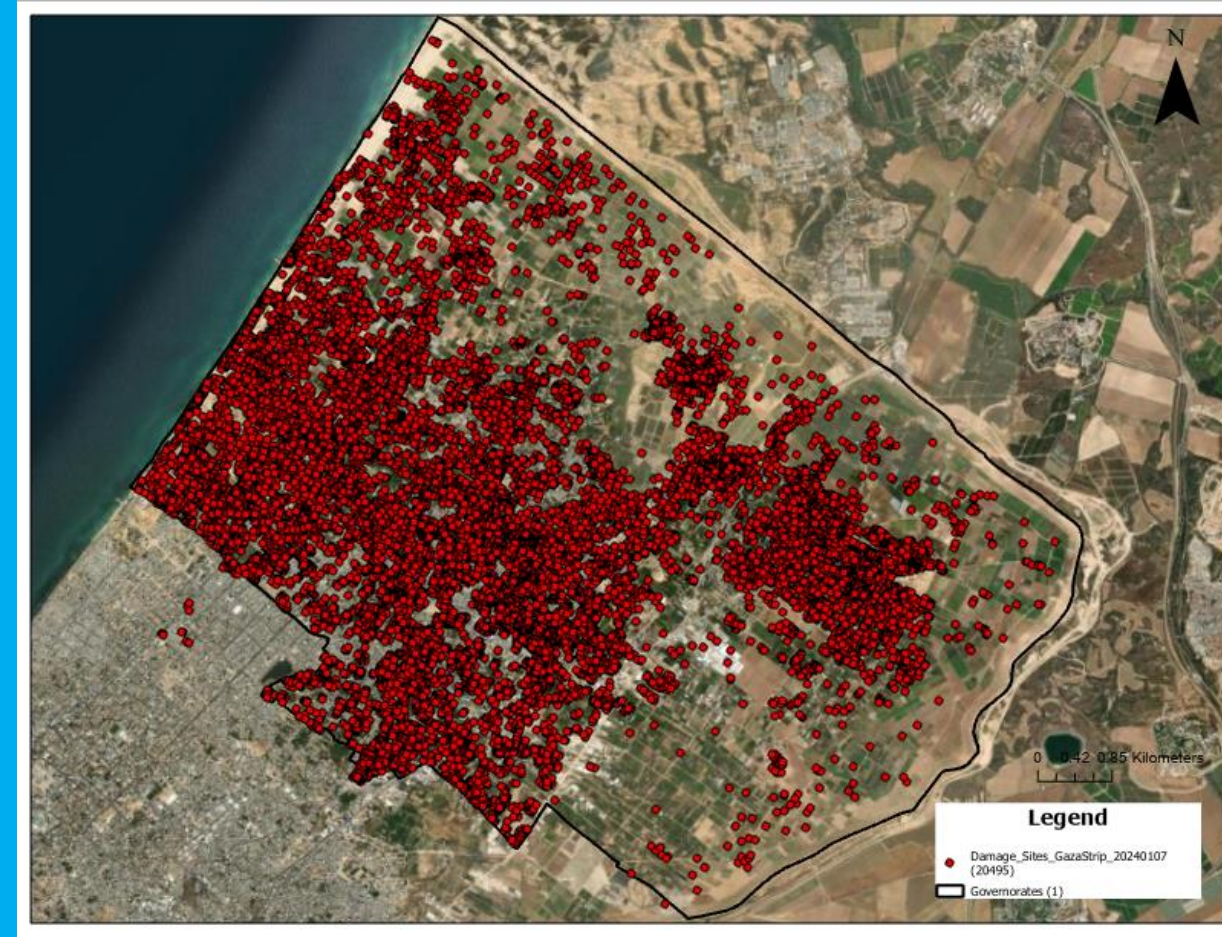


# Distribution of school buildings and Damaged sites per governorate

## North Gaza Governorate



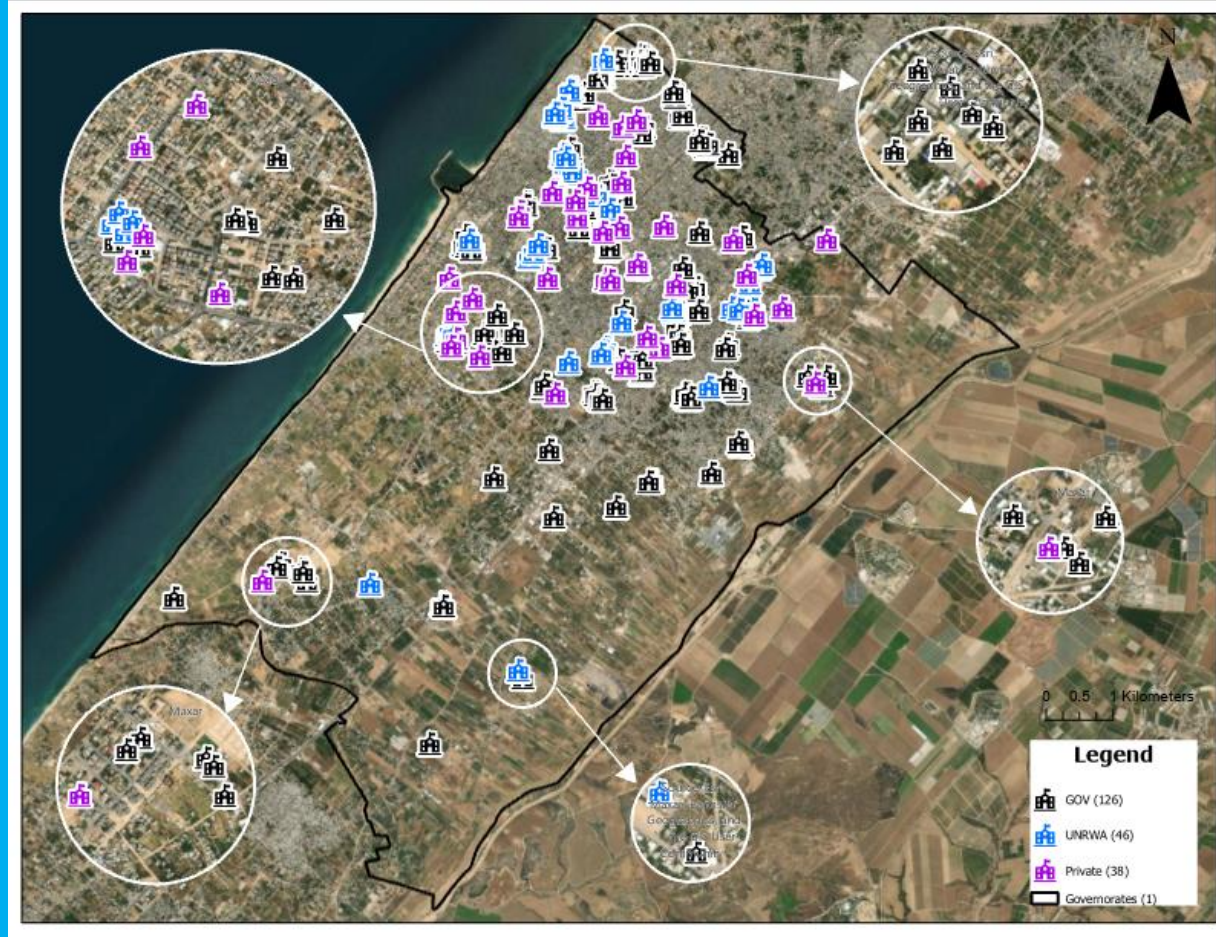
School buildings



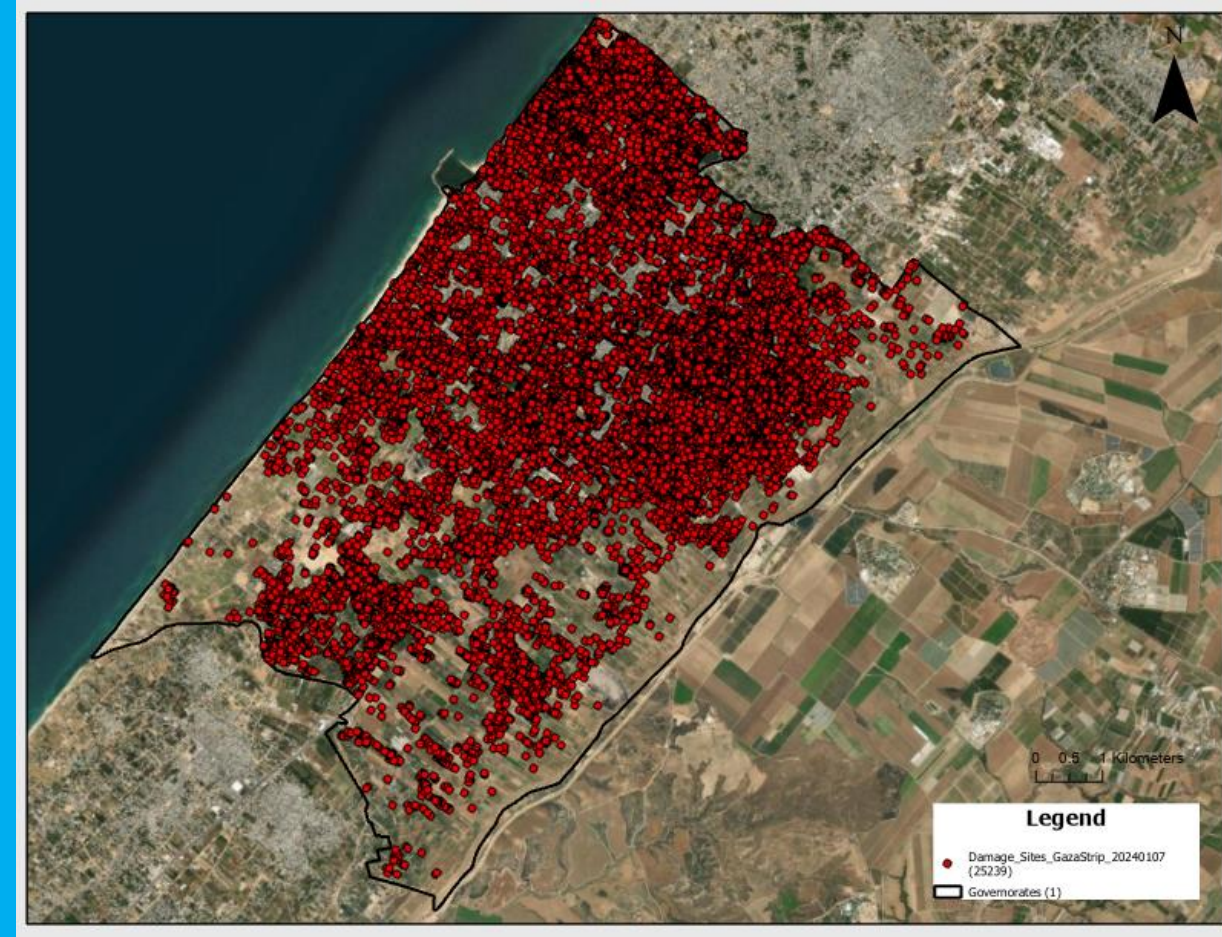
Damaged sites

# Distribution of school buildings and Damaged sites per governorate

## Gaza Governorate



School buildings

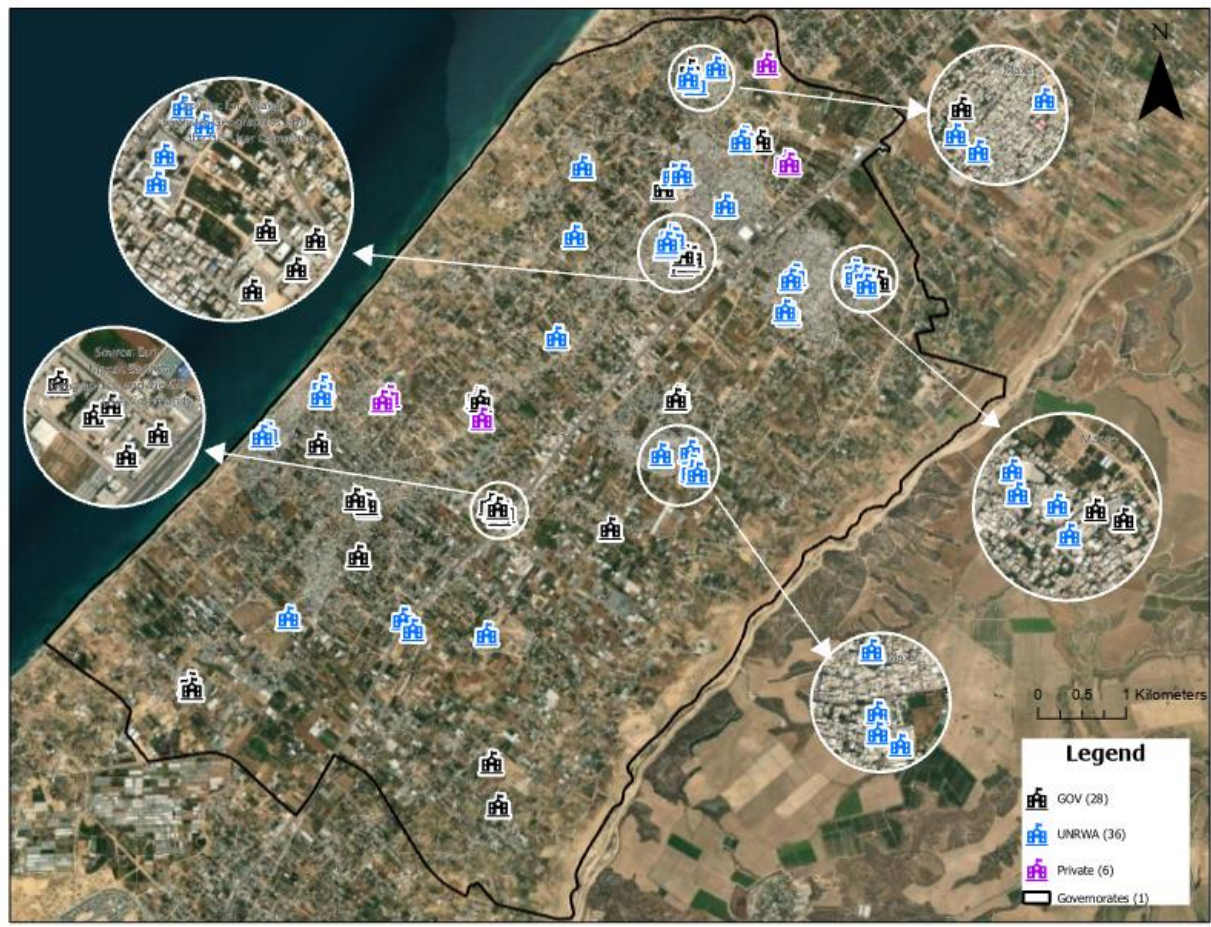


Damaged sites

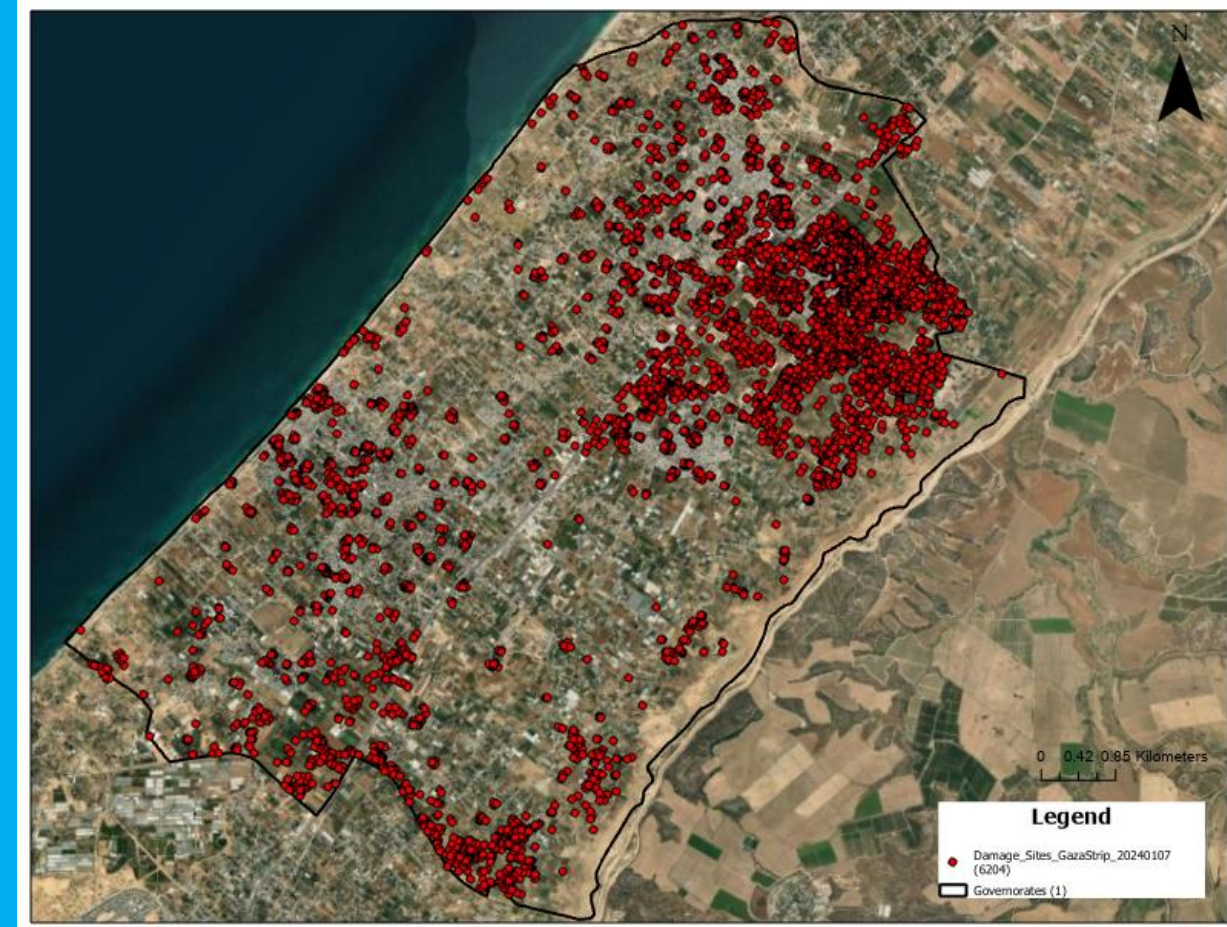


# Distribution of school buildings and Damaged sites per governorate

## Middle Area Governorate



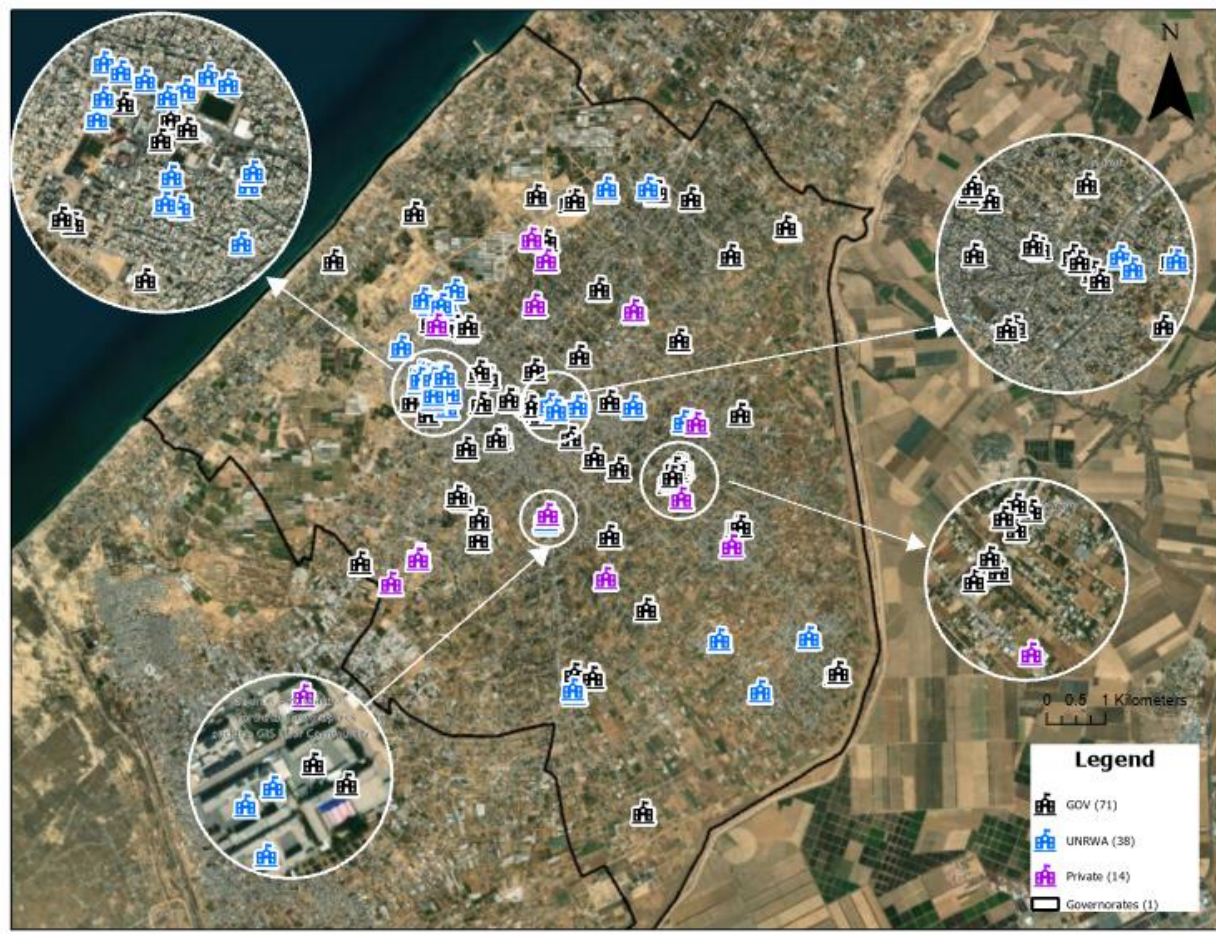
School buildings



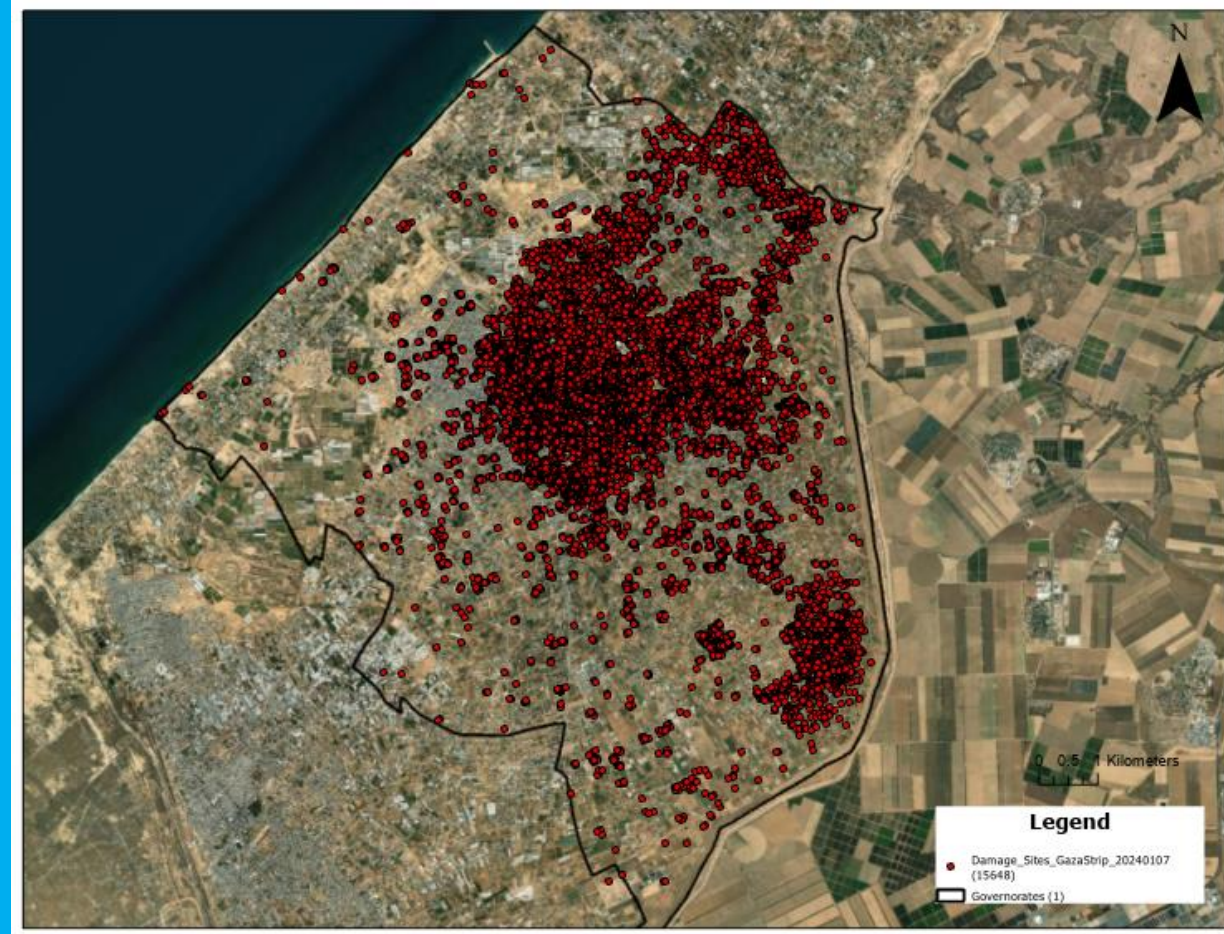
Damaged sites

# Distribution of school buildings and Damaged sites per governorate

## Khan Younis Governorate



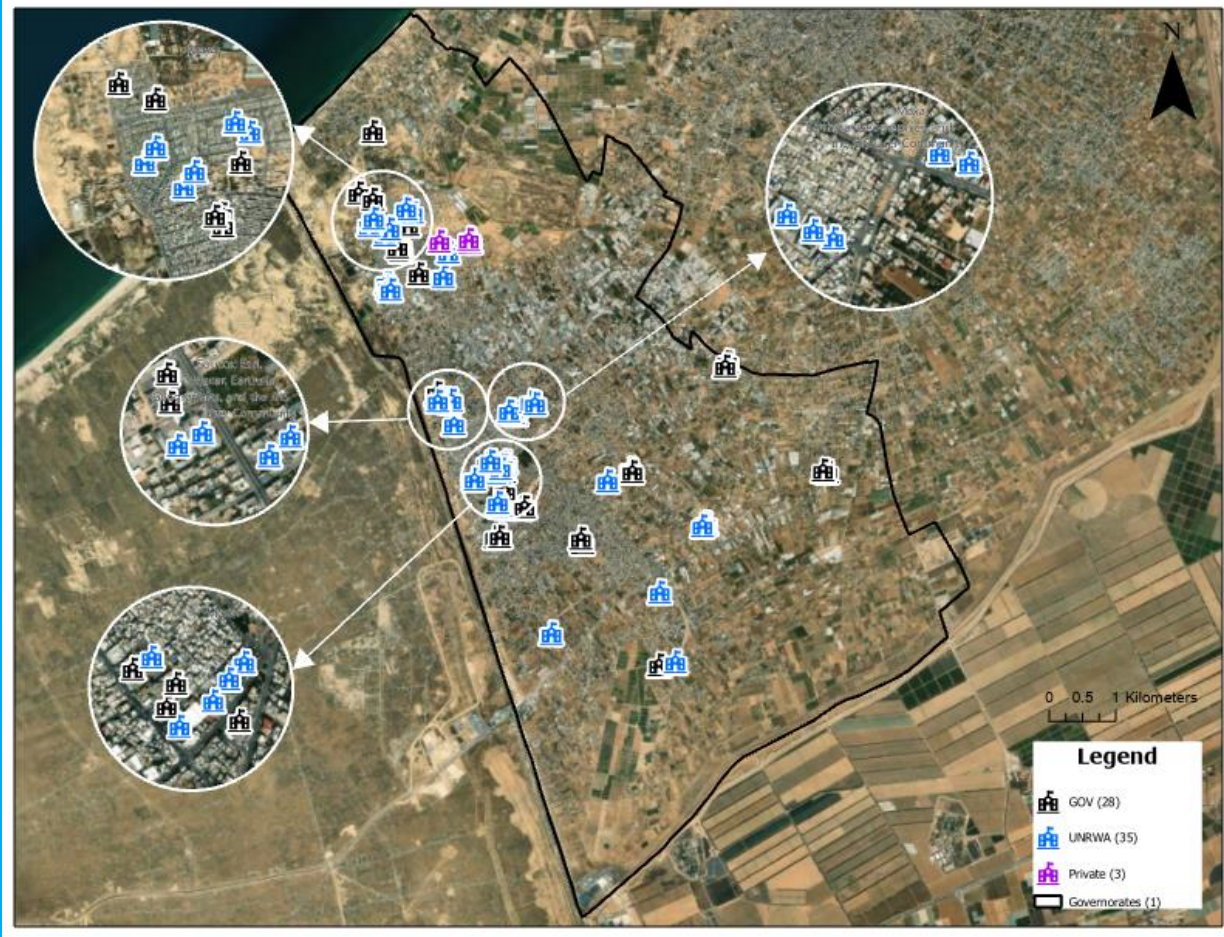
School buildings



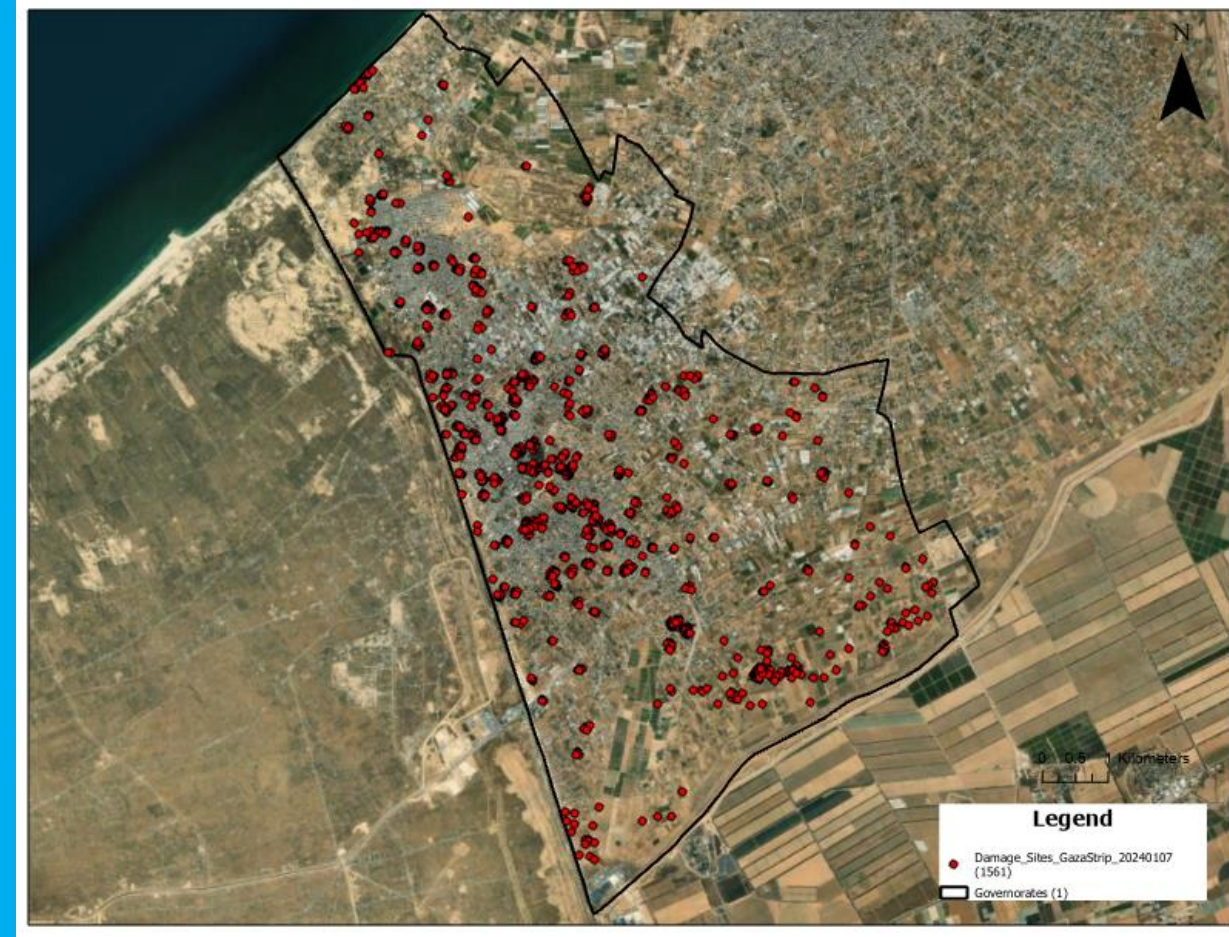
Damaged sites

# Distribution of school buildings and Damaged sites per governorate

## Rafah Governorate



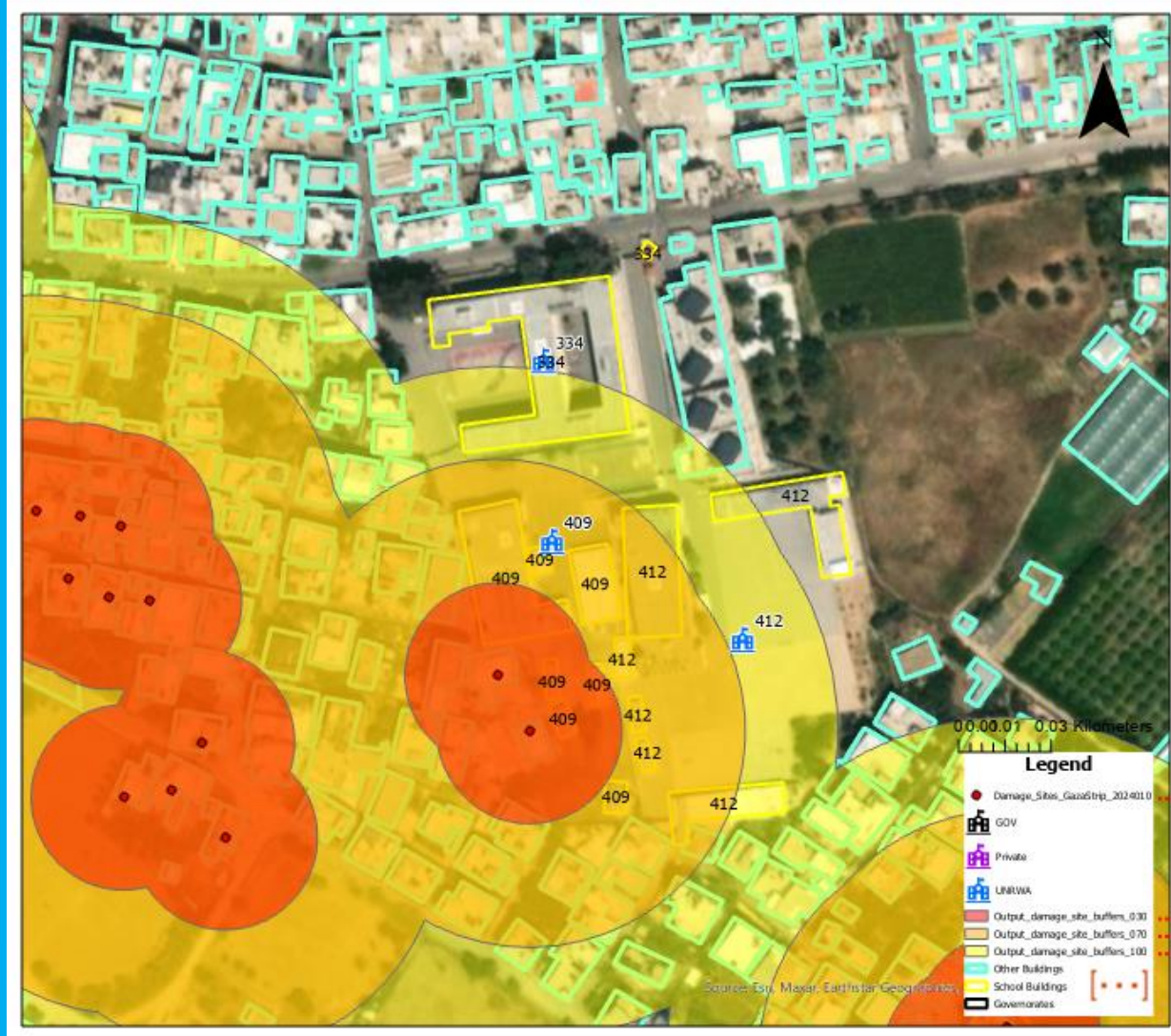
School buildings



Damaged sites

# Building Footprints\*

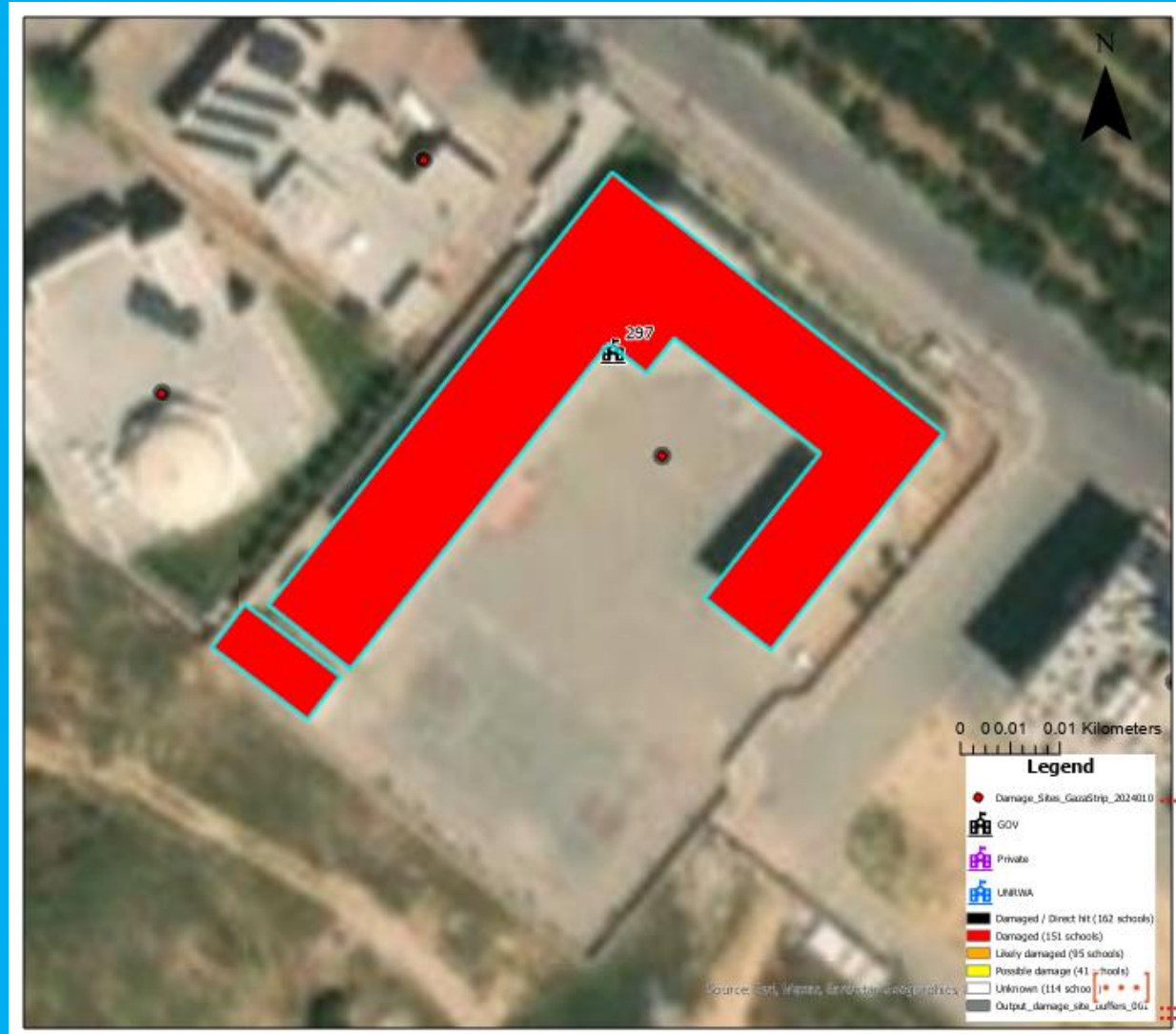
To represent schools using building footprints rather than points, to enhance the proximity analysis, the Assessment Team utilized Microsoft Building Footprints for the Gaza Strip which has 280,227 features as building footprints. Accordingly, the Assessment Team linked relevant building footprints to 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 **162** school buildings have been hit directly since 7 October 2023, this represents **28.8%** of the total school buildings in Gaza.
- Satellite-derived analysis found that at least **26** of these school buildings are **Totally destroyed**.

Probability of damage	Total (school buildings)	% (out of total school buildings)
<b>Direct hit</b> (at least one school building has been <b>directly</b> hit and at least one damaged school structure has been identified within school premises)	162	28.8%
<b>Damaged</b> (at least one damaged site has been identified within <b>30m</b> of the school buildings. This could indicate <b>severe damage</b> to school structures)	151*	26.8%
<b>Likely damaged</b> (at least one damaged site has been identified within <b>30-70m</b> of the school buildings. This could indicate <b>moderate damage</b> to school structures)	95	16.9%
<b>Possible damage</b> (at least one damaged site has been identified within 70-100m of the school buildings. This could indicate <b>minor damage</b> to school structures)	41	7.3%
<b>Unknown</b> (school buildings with no reported damage sites within <b>100m</b> . This could indicate that school structures have not sustained damage)	114	20.2%
<b>Total</b>	<b>563</b>	

\* 29 hits have been identified inside schools' boundaries (playgrounds), but have not hit school buildings, classified as "Damaged", See the next slides.

# 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)
<b>Direct hit</b> (at least one school building has been <b>directly</b> hit and at least one damaged school structure has been identified within school premises)	162	235
<b>Damaged</b> (at least one damaged site has been identified within <b>30m</b> of the school buildings. This could indicate <b>severe damage</b> to school structures)	151	222
<b>Likely damaged</b> (at least one damaged site has been identified within <b>30-70m</b> of the school buildings. This could indicate <b>moderate damage</b> to school structures)	95	141
<b>Possible damage</b> (at least one damaged site has been identified within 70-100m of the school buildings. This could indicate <b>minor damage</b> to school structures)	41	58
<b>Unknown</b> (school buildings with no reported damage sites within <b>100m</b> . This could indicate that school structures have not sustained damage)	114	157
<b>Total</b>	<b>563*</b>	<b>813</b>

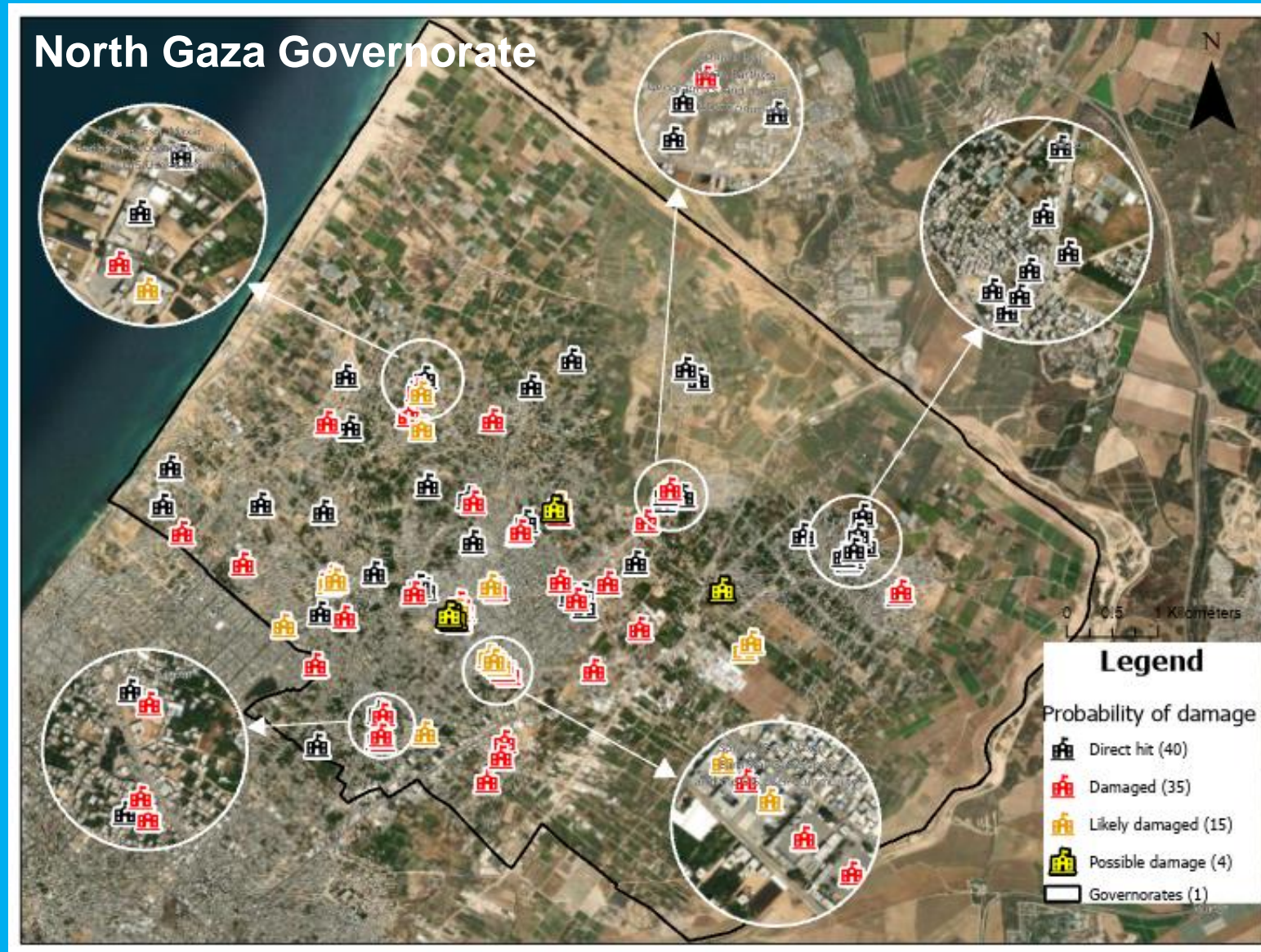
\* Number of school buildings includes 9 new buildings (final stage of construction)

# Findings (damage per Governorate)

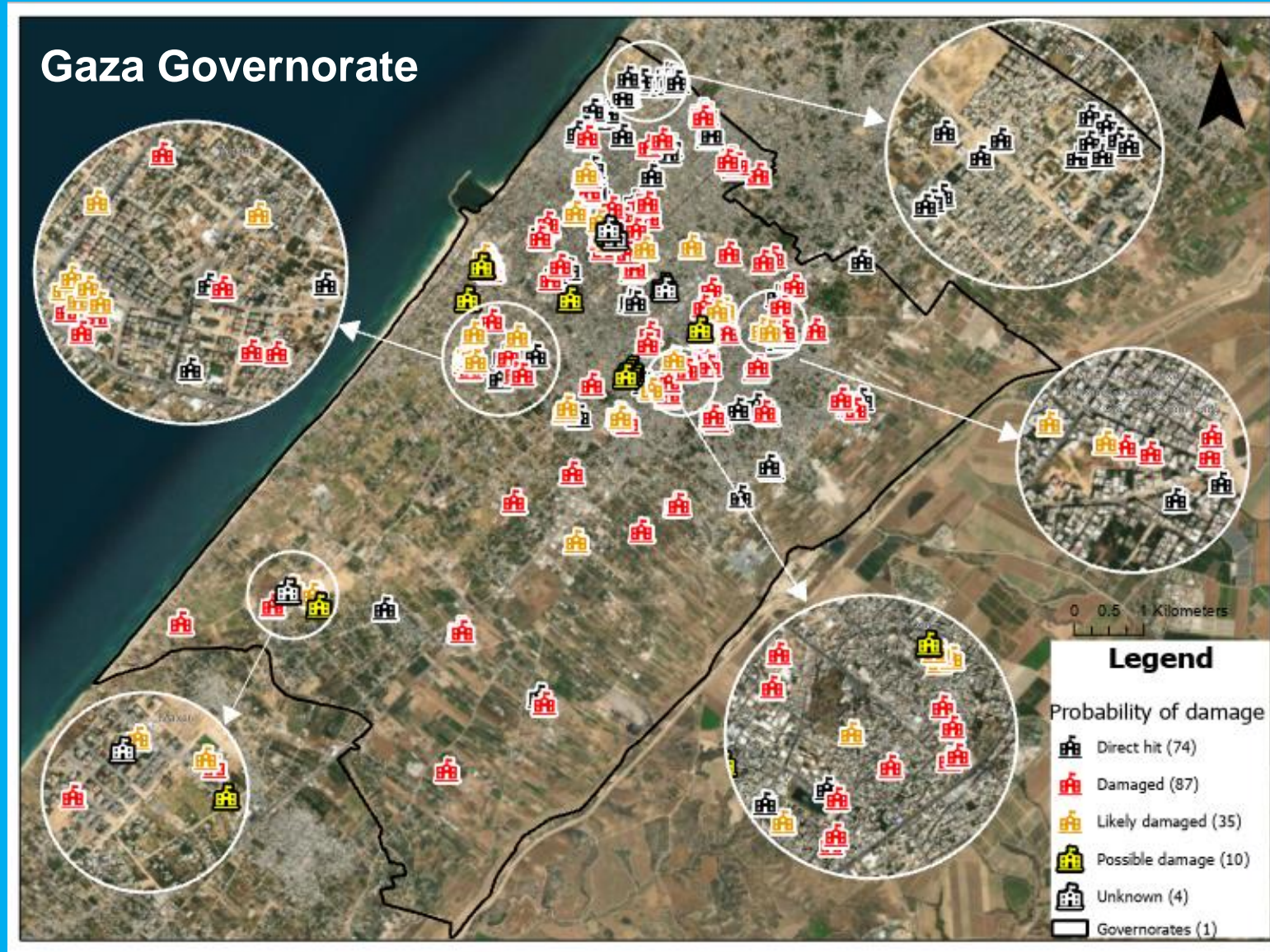
Probability of damage	North Gaza	Gaza	Middle Area	Khan Younis	Rafah	Total (school buildings)
<b>Direct hit</b> (at least one school building has been <b>directly</b> hit and at least one damaged school structure has been identified within school premises)	40	74	10	38	-	162
<b>Damaged</b> (at least one damaged site has been identified within <b>30m</b> of the school buildings. This could indicate <b>severe damage</b> to school structures)	35	87	13	8	8	151
<b>Likely damaged</b> (at least one damaged site has been identified within <b>30-70m</b> of the school buildings. This could indicate <b>moderate damage</b> to school structures)	15	35	18	15	12	95
<b>Possible damage</b> (at least one damaged site has been identified within 70-100m of the school buildings. This could indicate <b>minor damage</b> to school structures)	4	10	10	12	5	41
<b>Unknown</b> (school buildings with no reported damage sites within <b>100m</b> . This could indicate that school structures have not sustained damage)	-	4	19	50	41	114
<b>Total</b>	94	210	70	123	66	563



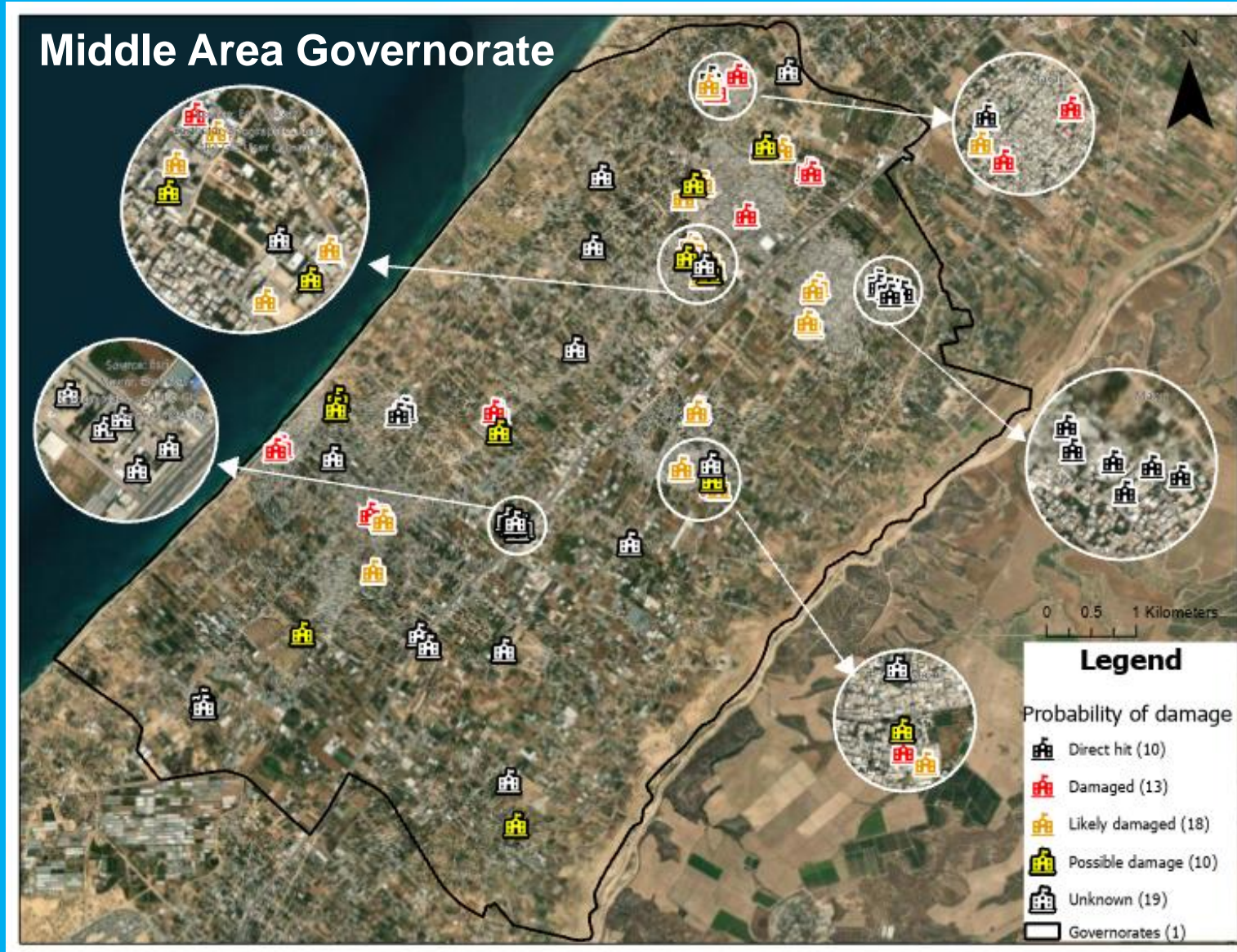
# Findings (damage per Governorate)



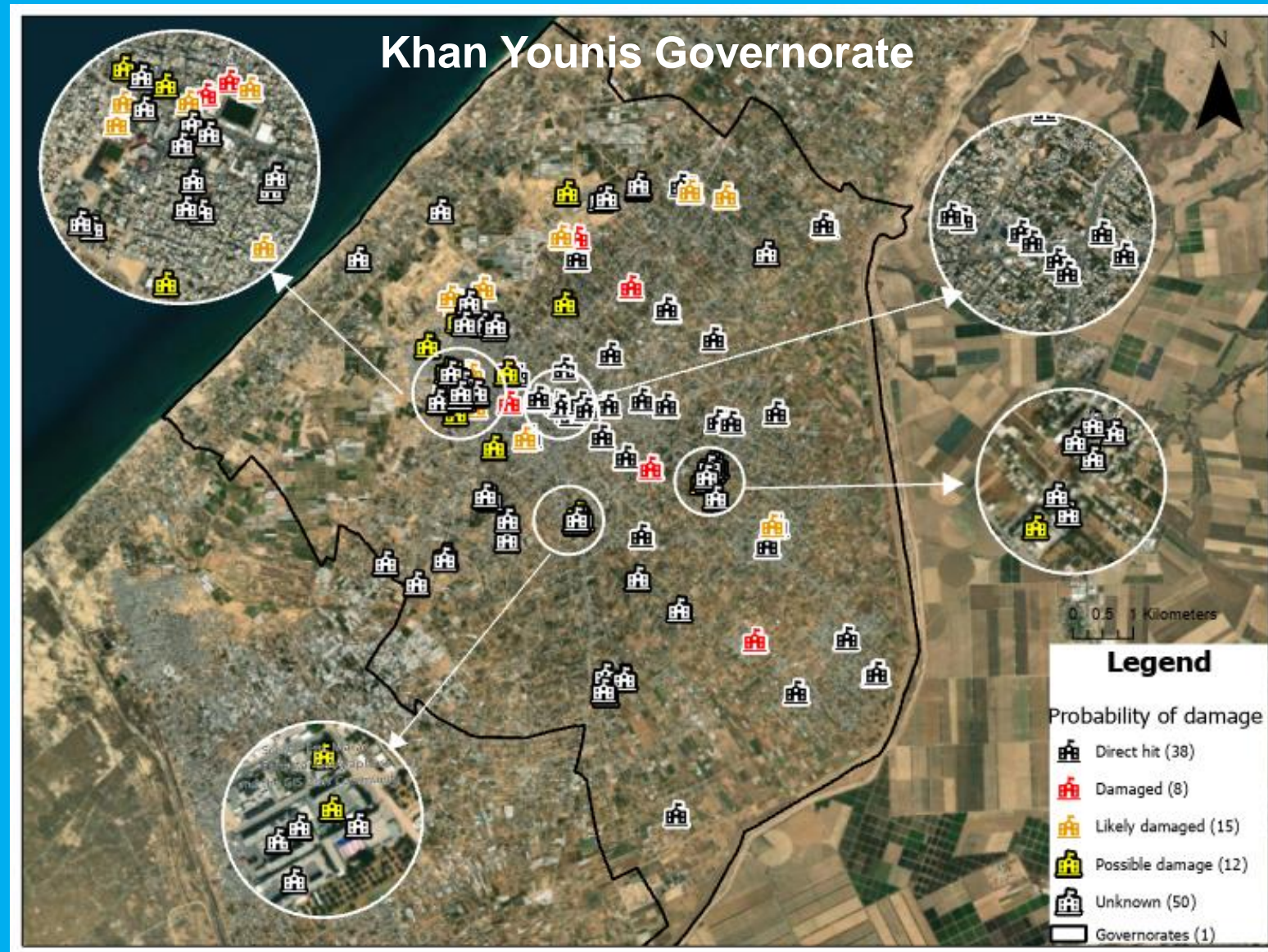
# Findings (damage per Governorate)



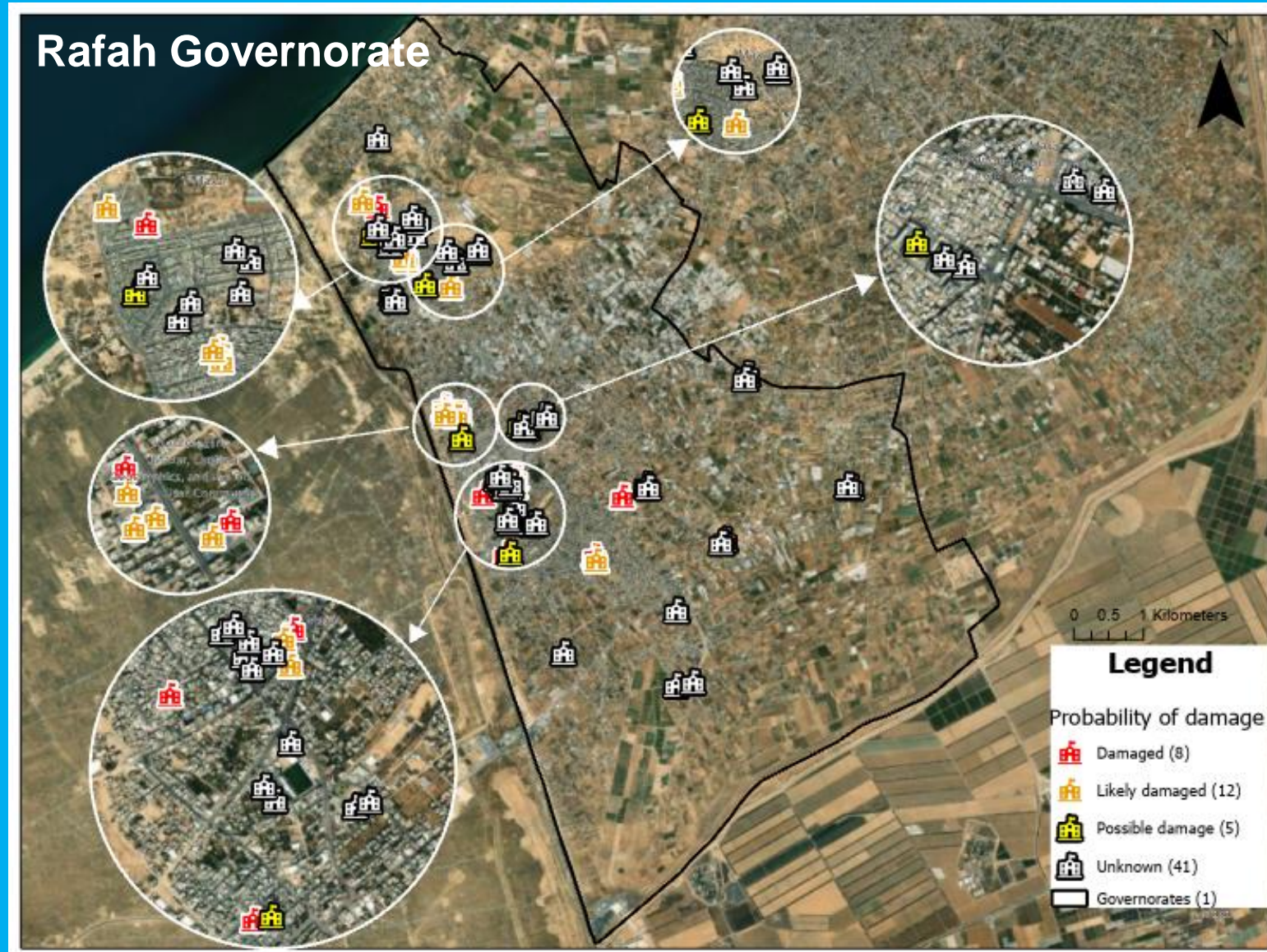
# Findings (damage per Governorate)



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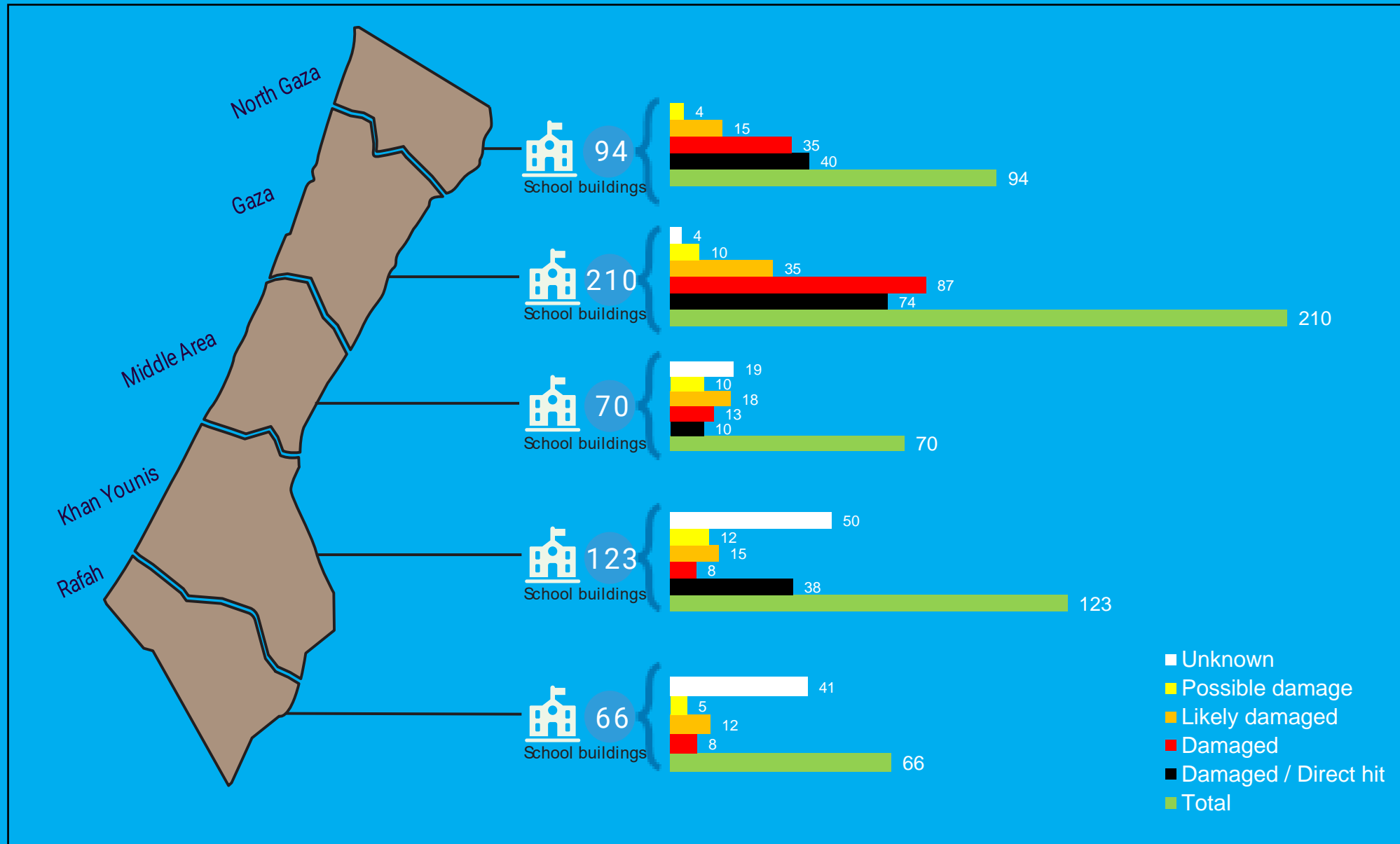


# Findings (damage per Governorate)

North Gaza governorate is the most affected with **80%** of its school buildings being either directly hit or **damaged**.

followed by Gaza governorate with **76%** of its total school buildings.

While **31%** of Khan Younis governorate school buildings are directly hit.



# Findings (damage per Type)

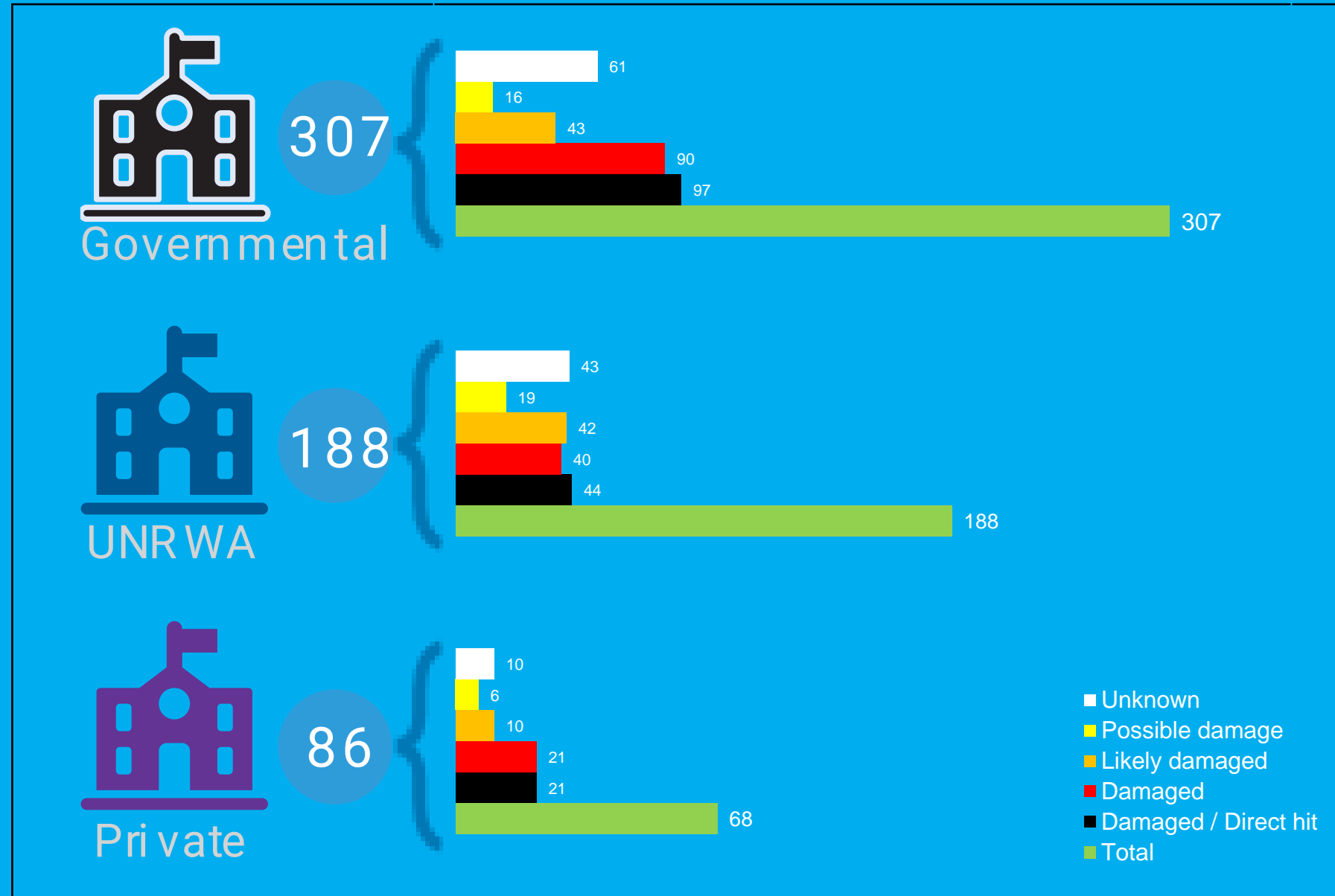
Probability of damage	Government	UNRWA	Private	Total (school buildings)
<b>Direct hit</b> (at least one school building has been <b>directly</b> hit and at least one damaged school structure has been identified within school premises)	97	44	21	162
<b>Damaged</b> (at least one damaged site has been identified within <b>30m</b> of the school buildings. This could indicate <b>severe damage</b> to school structures)	90	40	21	151
<b>Likely damaged</b> (at least one damaged site has been identified within <b>30-70m</b> of the school buildings. This could indicate <b>moderate damage</b> to school structures)	43	42	10	95
<b>Possible damage</b> (at least one damaged site has been identified within 70-100m of the school buildings. This could indicate <b>minor damage</b> to school structures)	16	19	6	41
<b>Unknown</b> (school buildings with no reported damage sites within <b>100m</b> . This could indicate that school structures have not sustained damage)	61	43	10	114
<b>Total</b>	307	188	68	563

# Findings (damage per Type)

61% (187) of Governmental school buildings have been either directly hit or damaged.

44% (84) of UNRWA school buildings have been either directly hit or damaged.

44% (42) of Private school buildings have been either directly hit or damaged.





- **Students and Teachers:**

- The 162 school buildings classified as **Direct hit** previously served some 175,000 students and more than 6,500 teachers.
- The 151 school buildings classified as **Damaged** previously served some 164,000 students and more than 6,300 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 7<sup>th</sup> of October, more than 318 school buildings have been used by IDP as shelters, the assessment results show that out of those school buildings, 142 are either **Directly hit (58)** or **Damaged (84)**.

# Comparison between the results of the assessment with the cluster initial reports

- Based on the initial reports from the field the Education Cluster through the “[Damaged Schools Dashboard](#)” reports that there are 141 school buildings destroyed or sustained severe damages. The results of this assessment show that there are 162 school buildings damaged/directly hit.
- Based on the initial reports from the field the Education Cluster reports that there are 128 school buildings sustained Moderate damages. The results of this assessment show that there are 151 school buildings with at least one damaged site has been identified within 30m of the school buildings.
- Based on the initial reports from the field the Education Cluster reports that there are 123 school buildings sustained Minor damages. The results of this assessment show that there are 136 school buildings Likely damaged or with Possible damage.
- 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 **military use of schools**.

- 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 the actual damages to school infrastructure might be 15% to 20% **higher** than what has been previously reported by the education cluster.
- At least **55%** of schools in Gaza will either need full reconstruction or major rehabilitation work to be functional again.
- **One-fourth** of directly hit and damaged schools are UN-run schools through UNRWA.
- **45%** of school buildings that have been used by IDP as shelters are either Directly hit or Damaged.
- The satellite-derived images provide evidence for **military use of schools**. The imagery of Israeli Forces tanks inside school premises is presented.

## 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:

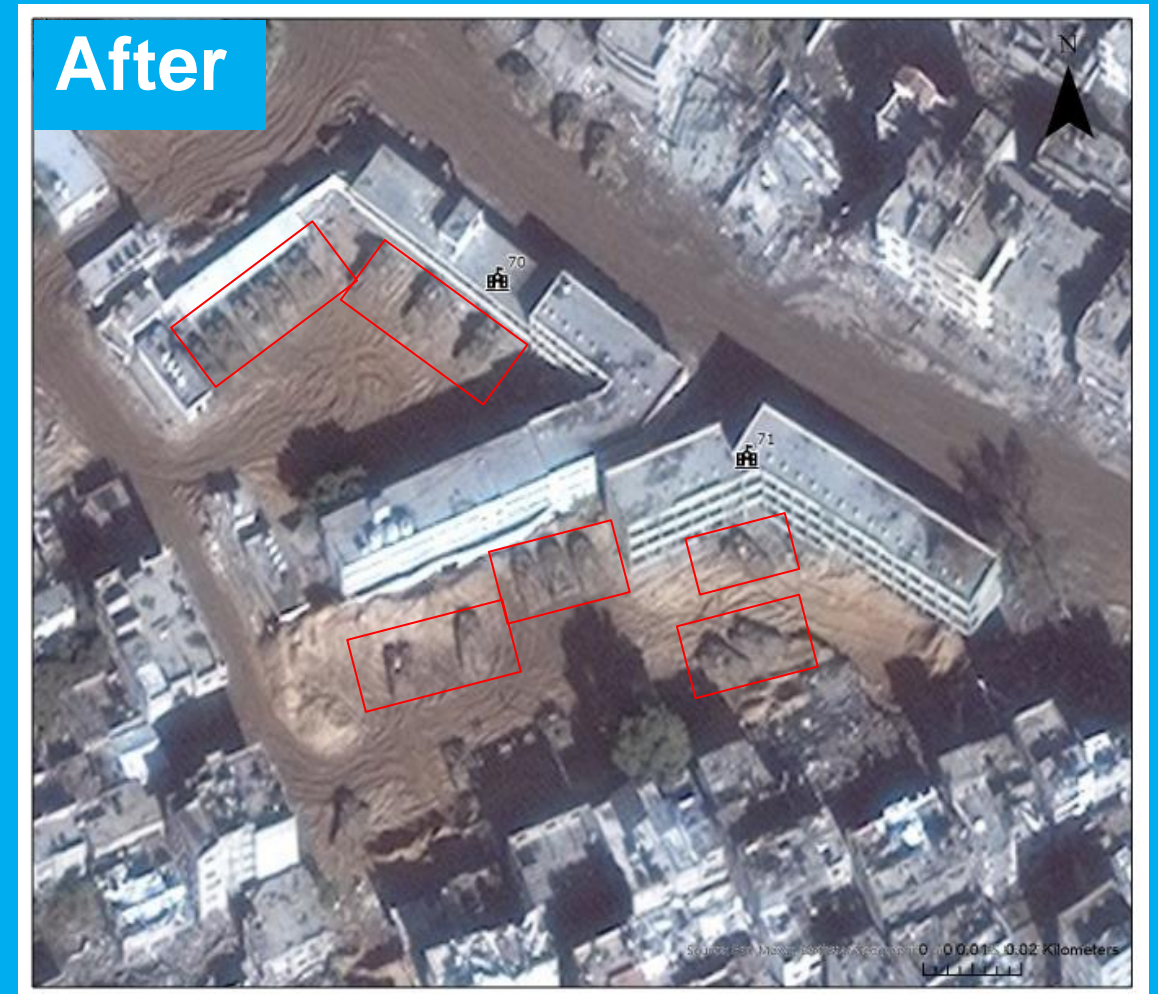
- To prepare to resume appropriate education activities once the conflict ends. In doing so, paying close attention to children's psychosocial, cognitive, physical health and wellbeing development.
- To prepare and implement alternative learning solutions – such as distance learning or learning in non-formal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

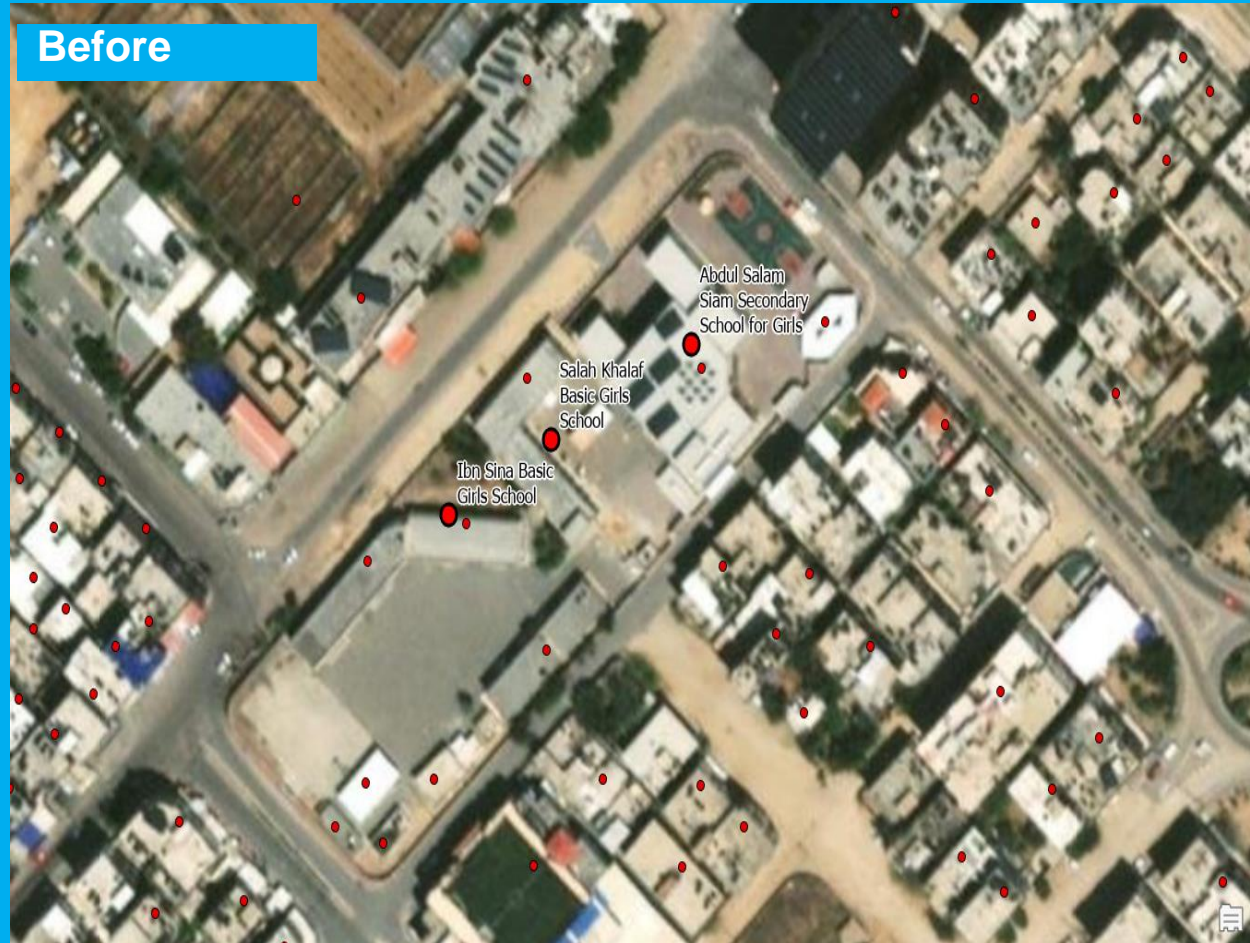
## Call to Action to Donors:

- 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 imagery from January 2024 shows heavy military tanks present inside at least 2 school premises in Gaza Governorate





\* Ibn Sina & Salah Khalaf & Abdul Salam Siam Schools - Gaza/An Naser



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



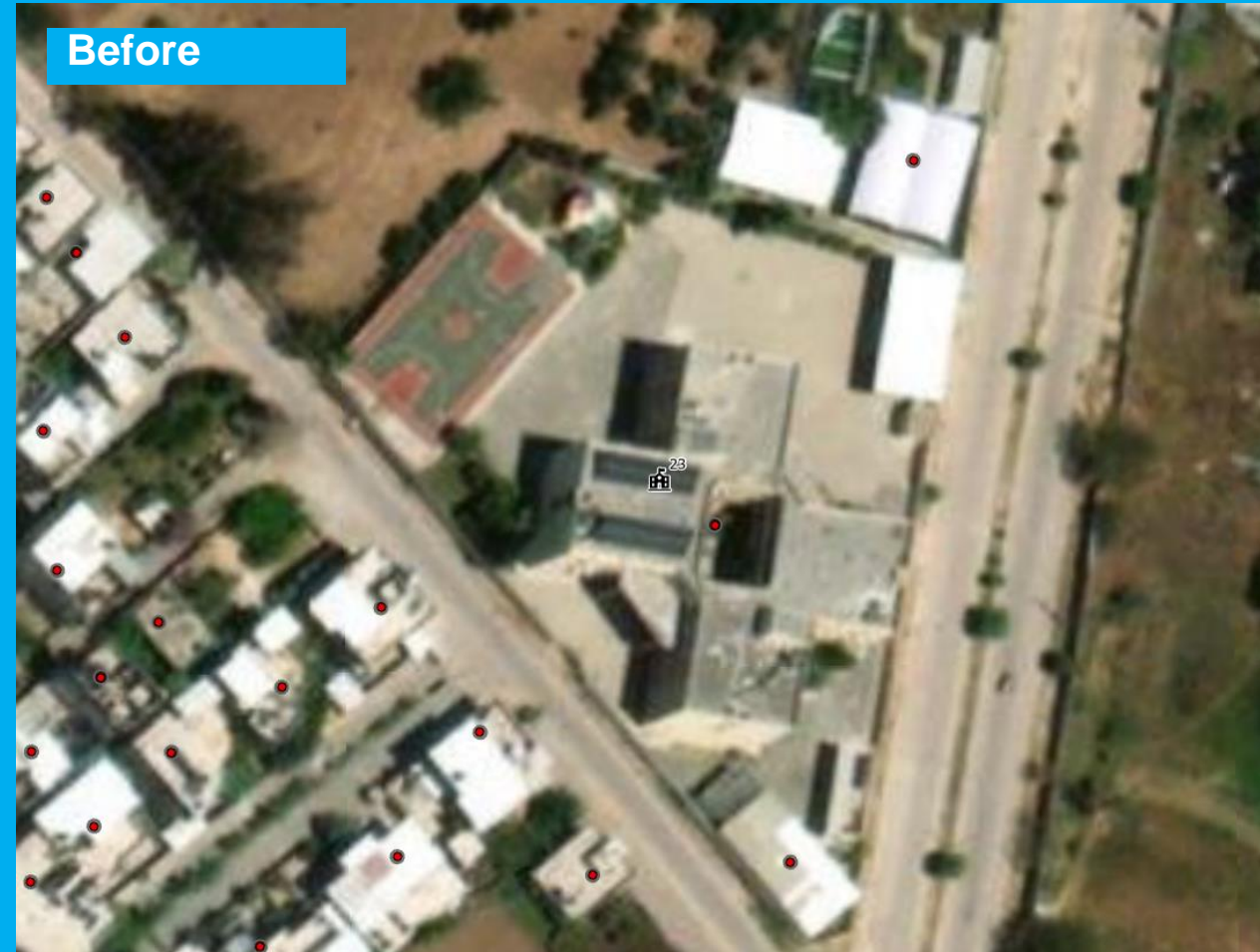
Before



After



\* Hail Abd Al Hamid Secondary Girls School - Beit Hanoun/Beit Hanoun (north east)



\* Beit Hanoun Secondary Girls School - Beit Hanoun/Hai Abu Rahma

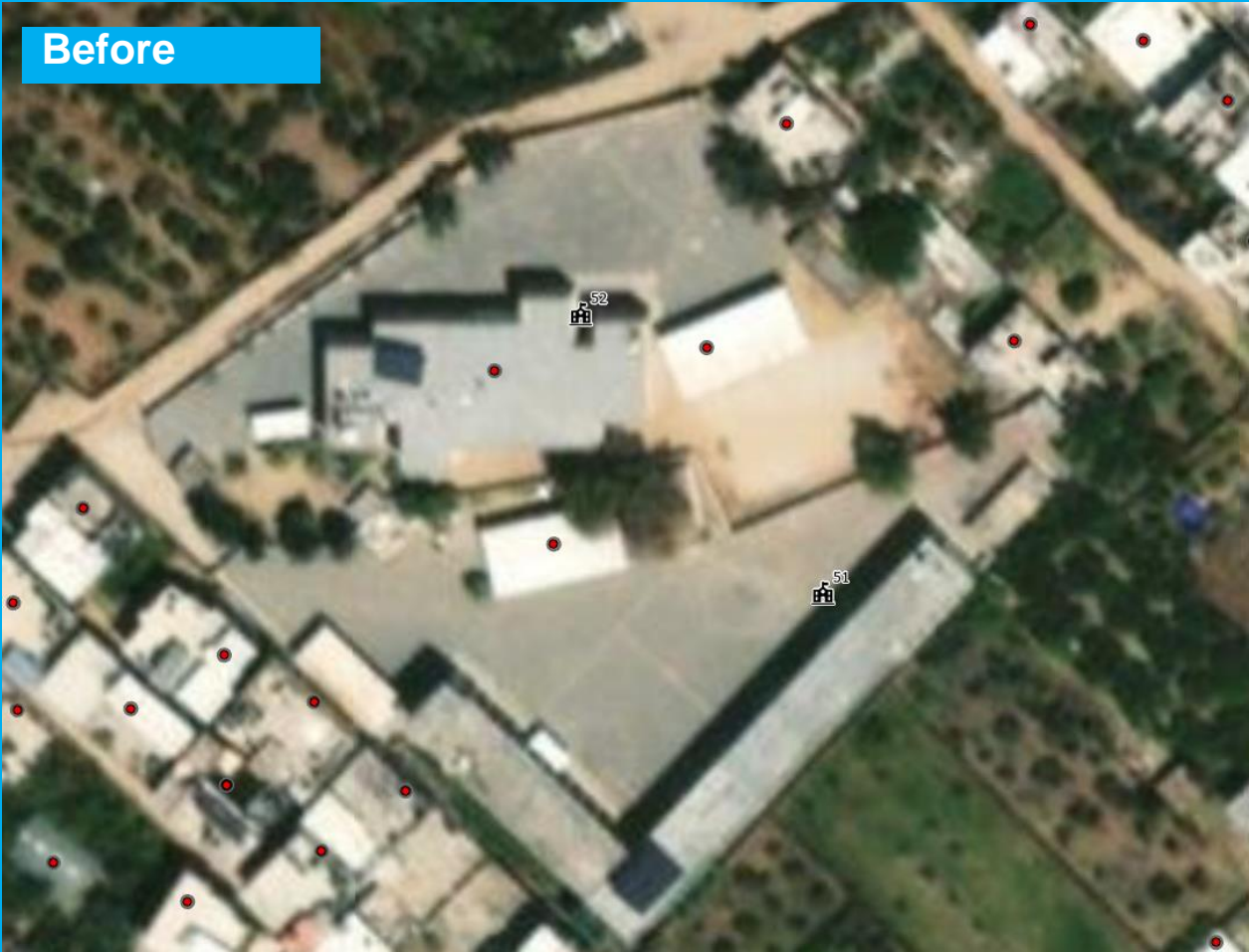
Before

After



\* Hani Naim Secondary Agricultural for Boys School - Beit Hanoun/Hai Abu Rahma

Before



After



\* Omar Ibn Abed Al Azeez Basic Boys School & Mouath Ibn Jabal Basic Boys School - Gaza/At Turukman

Before



After



\* Beit Dagan Basic Boys & Shuhada Al Shojaeya & Al Awqaf Al Shariah Private Schools - Gaza/Ijdedeh

Before

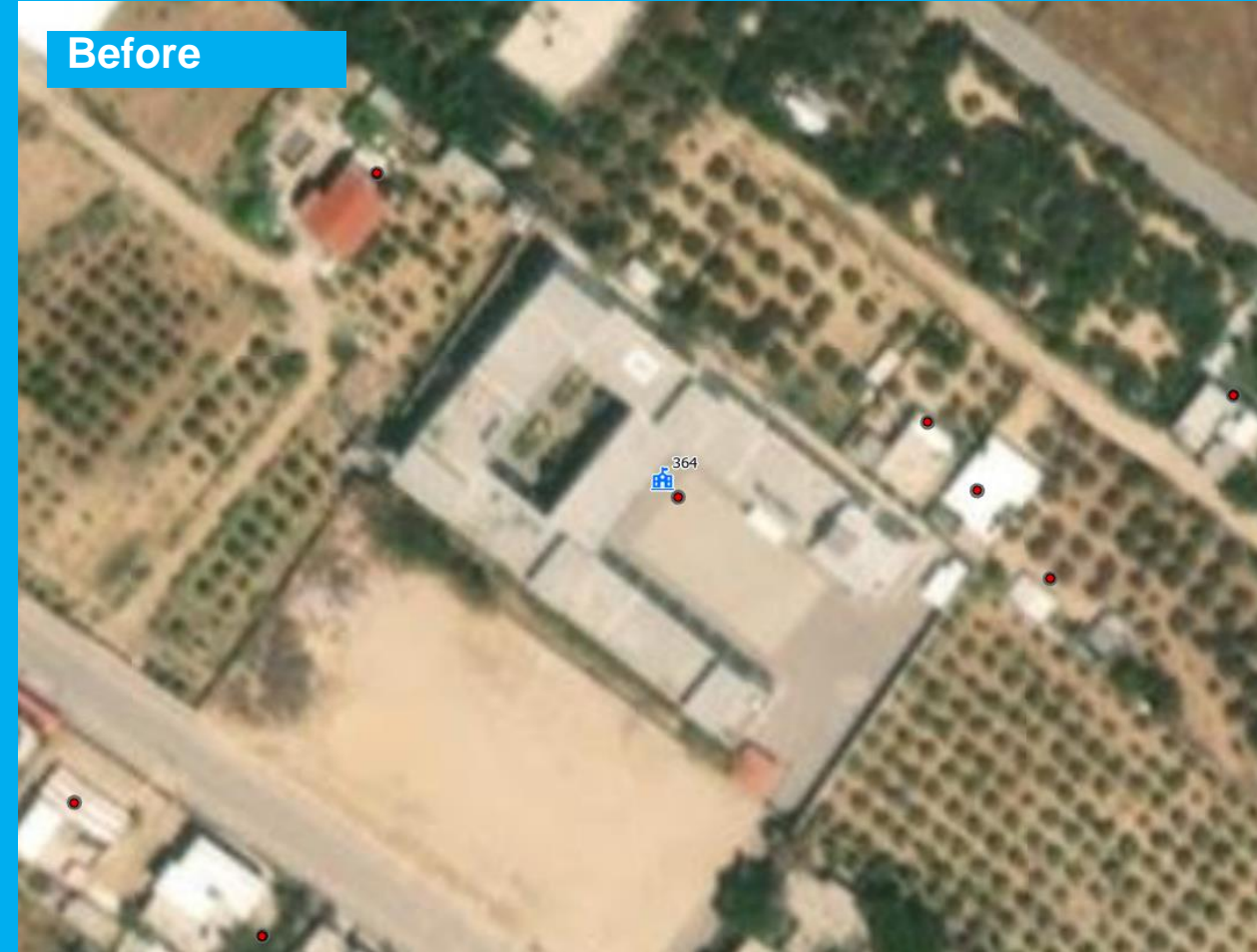


After



\* Bessan Basic Girls School & Tounes Basic Co-education Schools - Gaza/Az Zaitoun

Before



After



\* Wadi Gaza Prep. Co-ed - Middle Area/Juhor ad Dik

Before



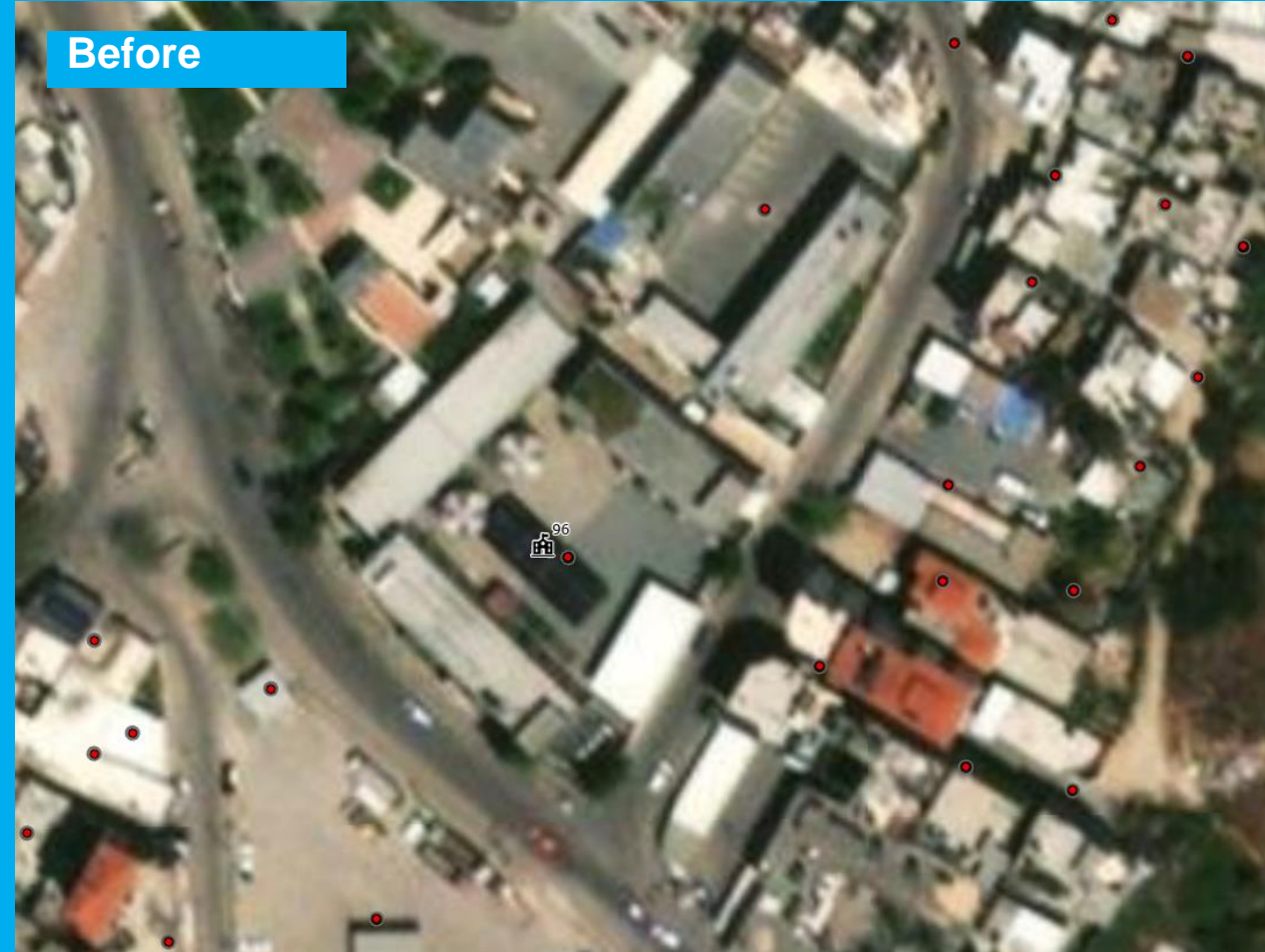
After



\* Abed Al Mouty Al Rayes & Zenab Al Rayes Basic Co-education School - Gaza/Az Zahra'a (north)



Before



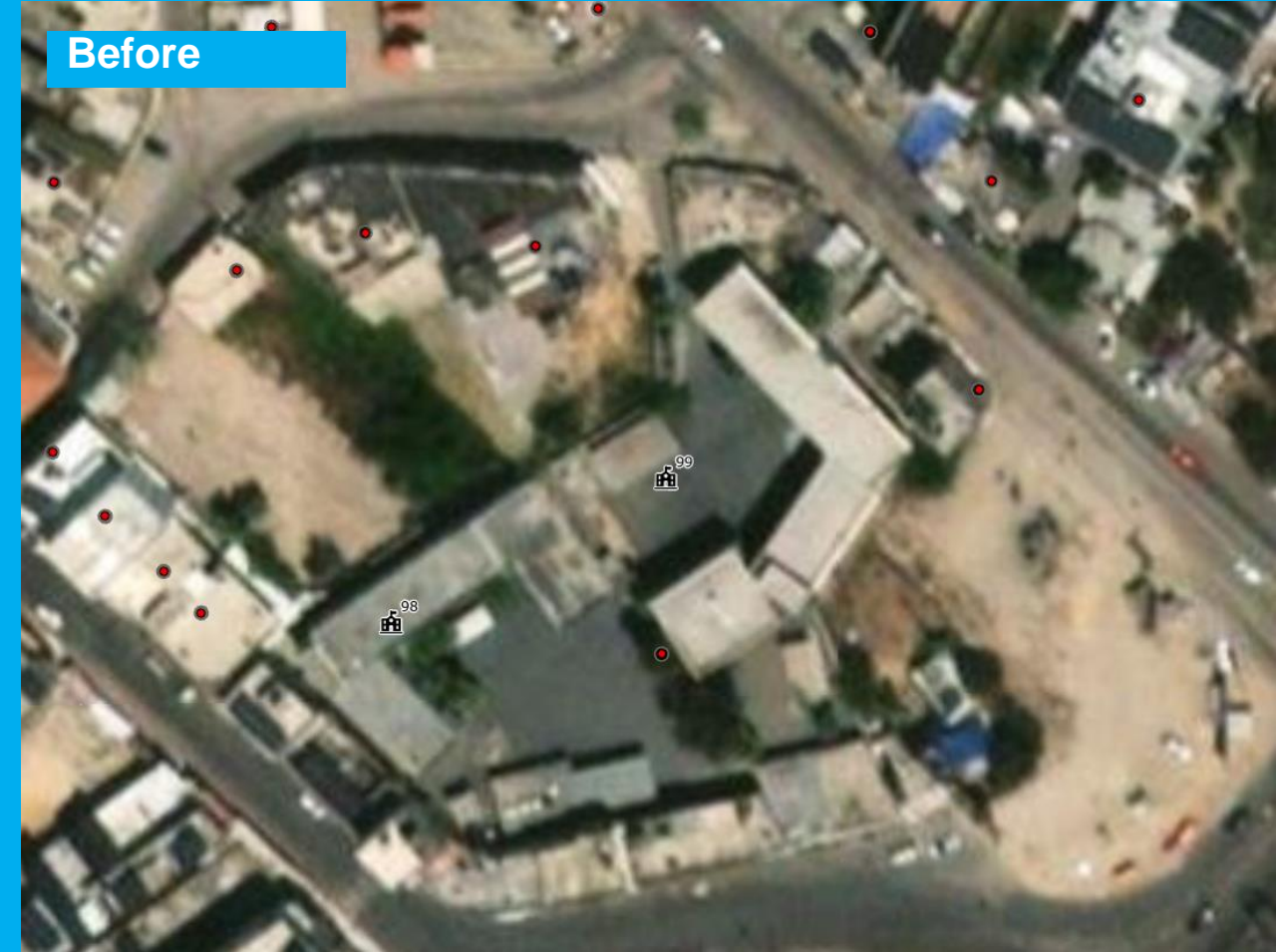
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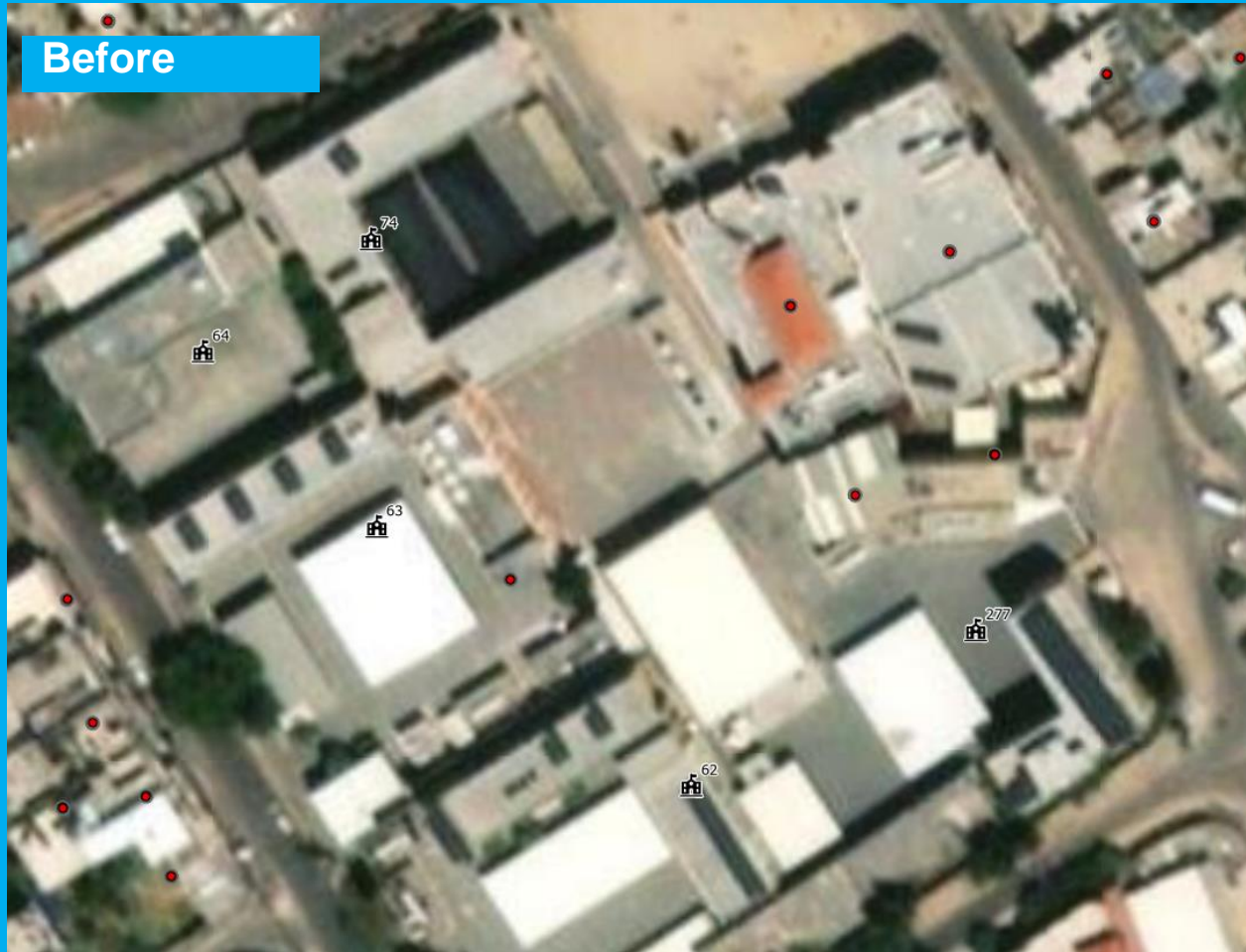
\* Al Ramla Girls School - Gaza/Gaza Old City

Before

After



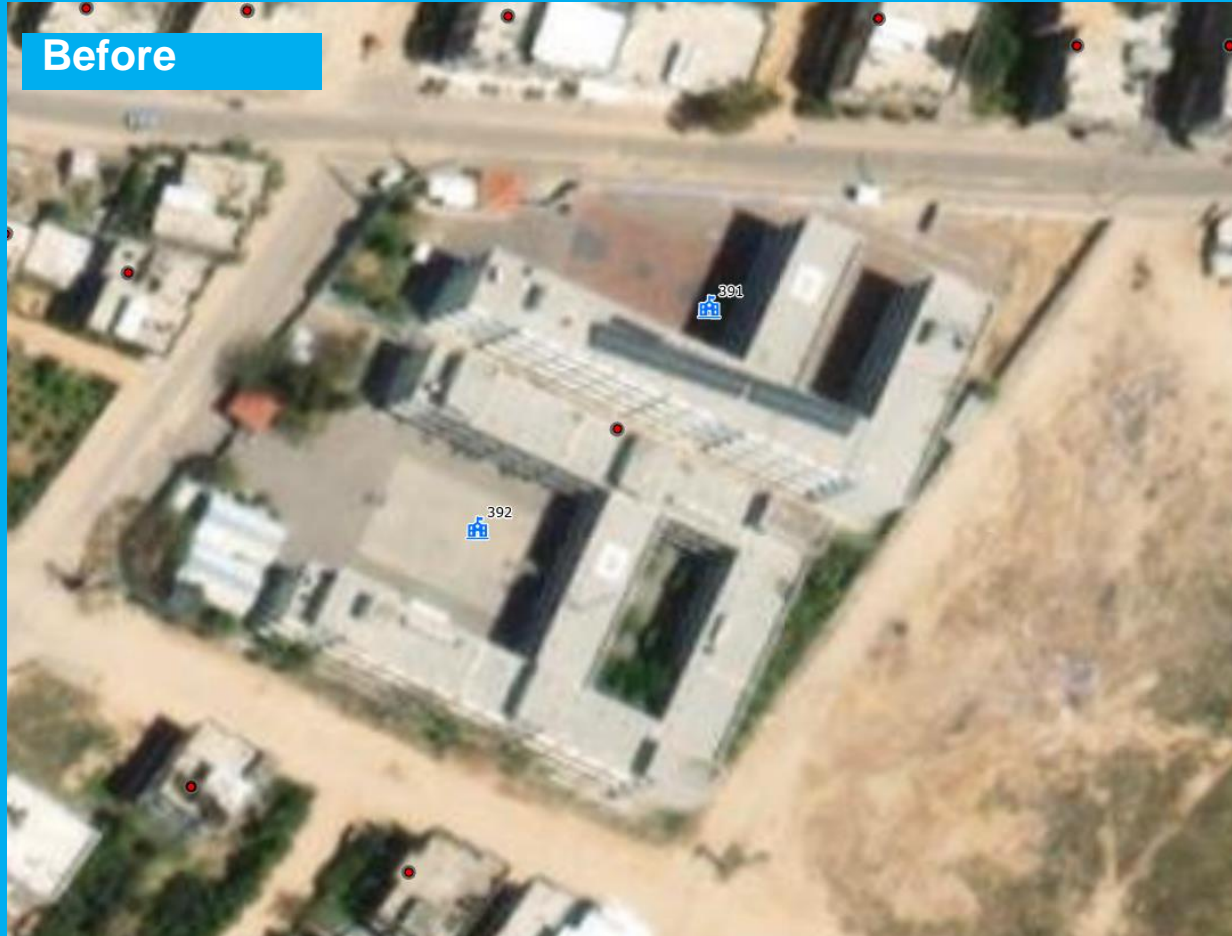
\* Hashim Basic Co-education School & Ibn Al-Haytham Basic Boys School - Gaza/Gaza Old City



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



\* B/Hanoun Prep. Boys "C" & B/Hanoun Elem. Boys & B/Hanoun Prep. Boys "B" & B/Hanoun Prep. Girls Schools - Beit Hanun/Al Balad



\* B/Hanoun Prep. Girls 'B' & B/Hanoun Elem. Co-education 'C' Schools - Beit Hanun/Beit Hanoun (north east)

For more information on the oPt Education Cluster and other education resources please visit our Web page on Relief Web [Occupied Palestinian Territory: Education | ReliefWeb Response](#)

SCAN ME 

