



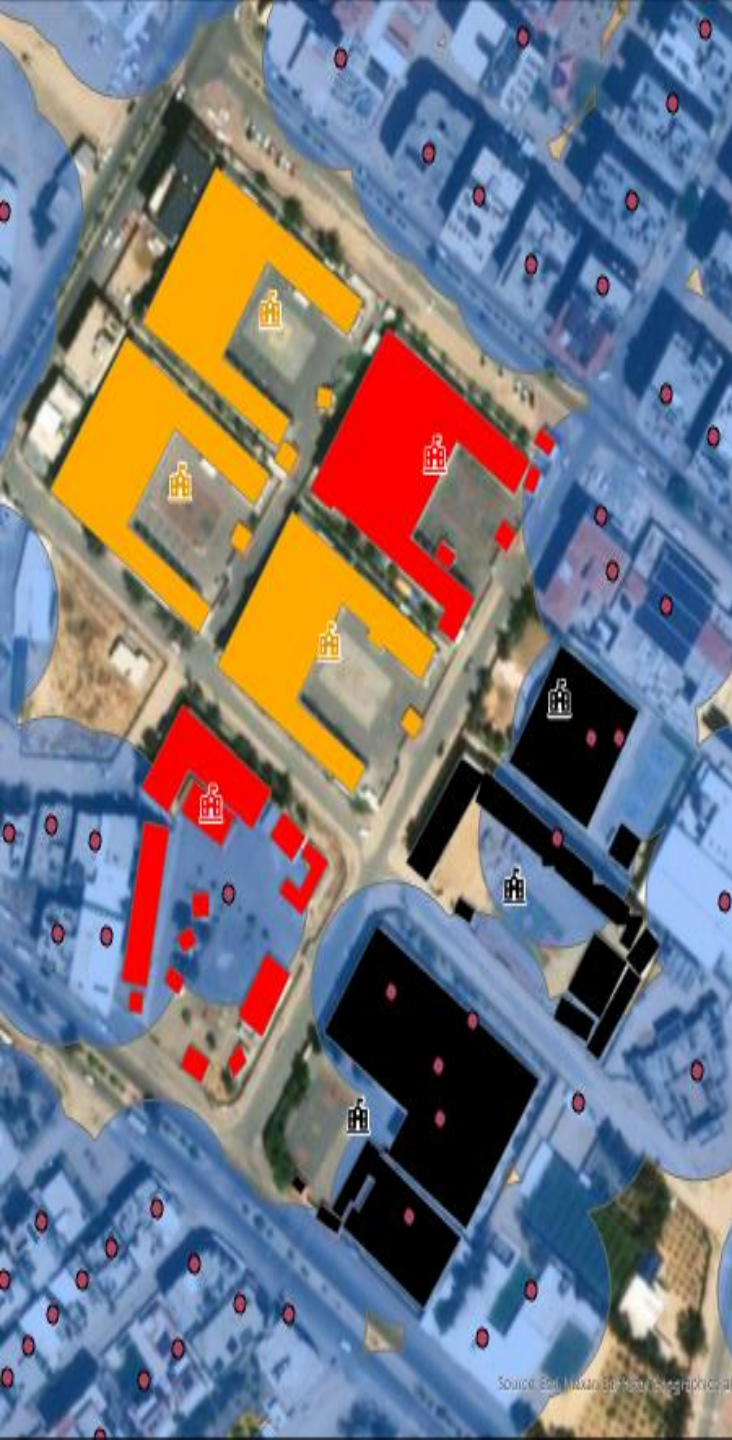
Occupied  
Palestinian Territory  
Education Cluster

# Verification of damages to schools

based on proximity to damaged sites

Gaza, Occupied Palestinian Territory

3 June 2024



Source: Esri, Maxar, GeoEye, AeroGRID, IGN, SDA, CNES, Airbus

Update # 4

# 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](#) of the “**Verification of damages to schools based on proximity to damaged sites**” on the 10<sup>th</sup> of January, the [second update](#) on the 26<sup>th</sup> of March, and the [third update](#) on the 25<sup>th</sup> of April.

# Objective

Due to the increased access limitation to the field across the Gaza Strip, 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\_20240503

- **Satellite Imagery:**

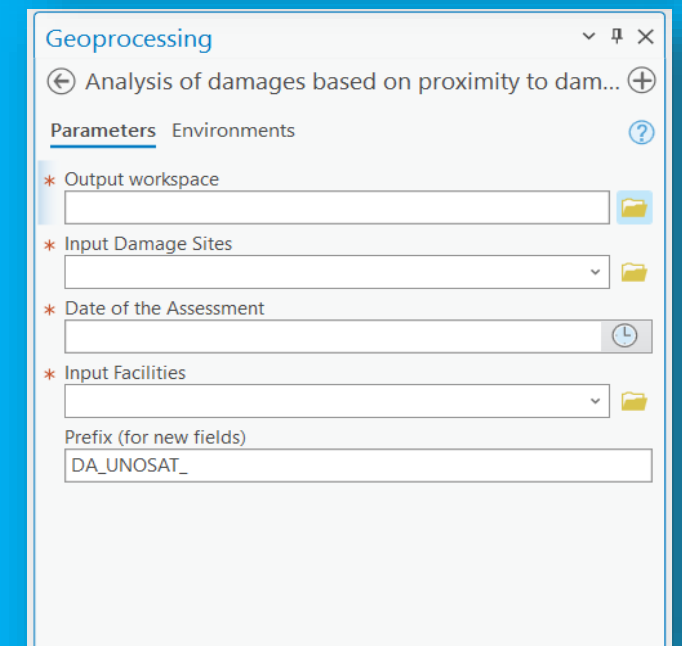
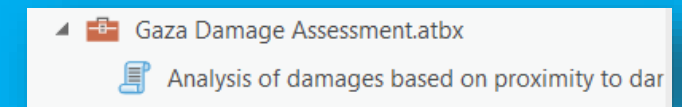
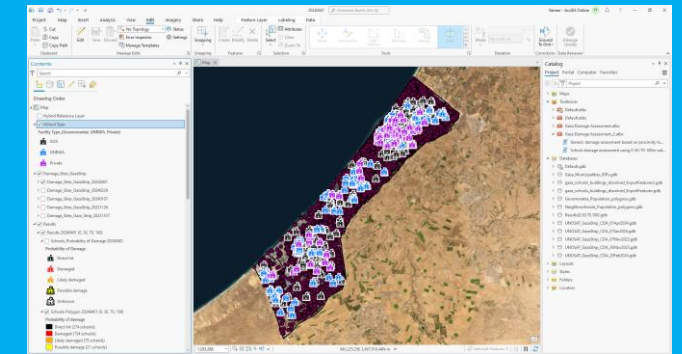
- 03 May 2024 © Maxar 2024
- 07 May 2024 © Maxar 2024

- **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

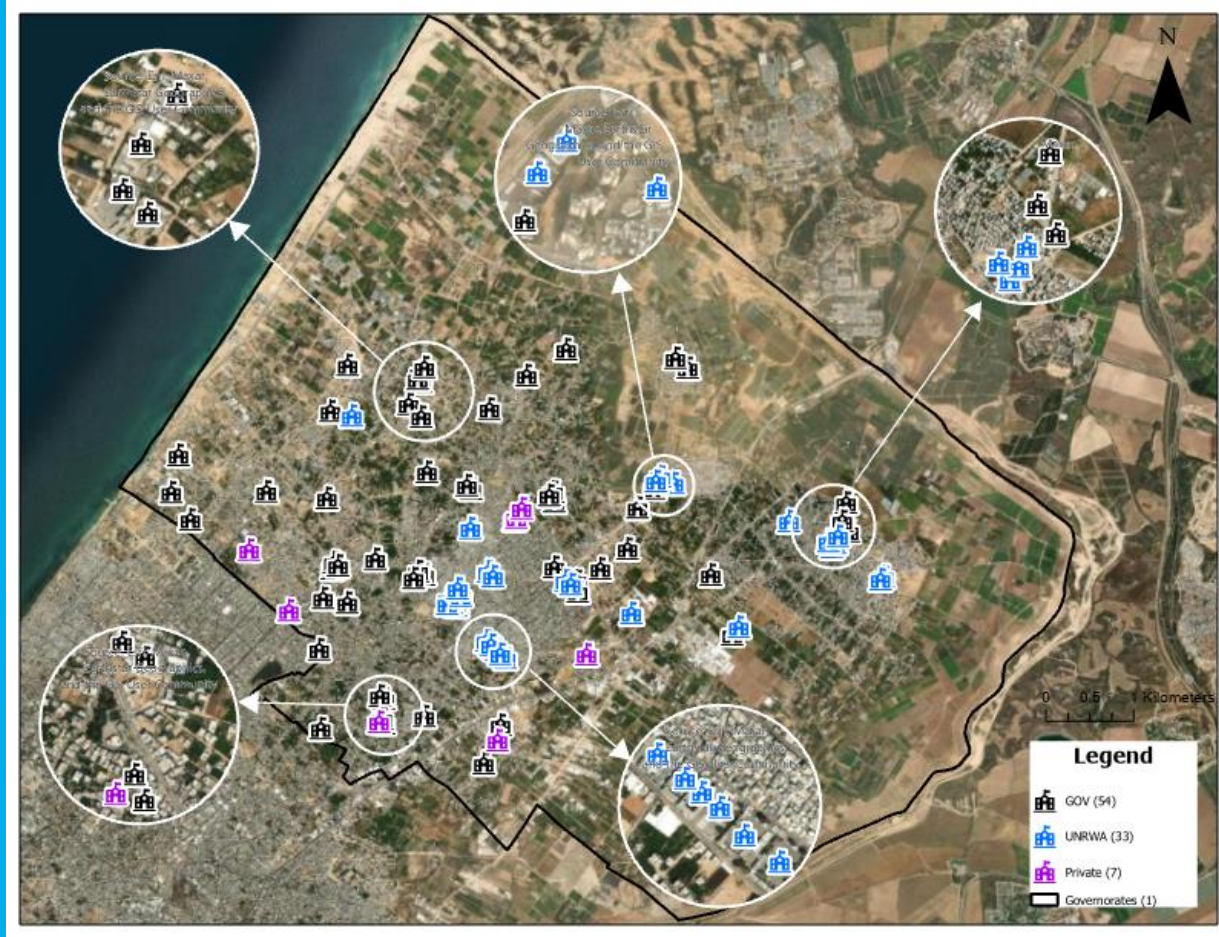
The **Gaza Strip** (365 km<sup>2</sup>), with **2.3 million** population is one of the most densely populated areas in the world at 5,900 residents/ square kilometer.

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

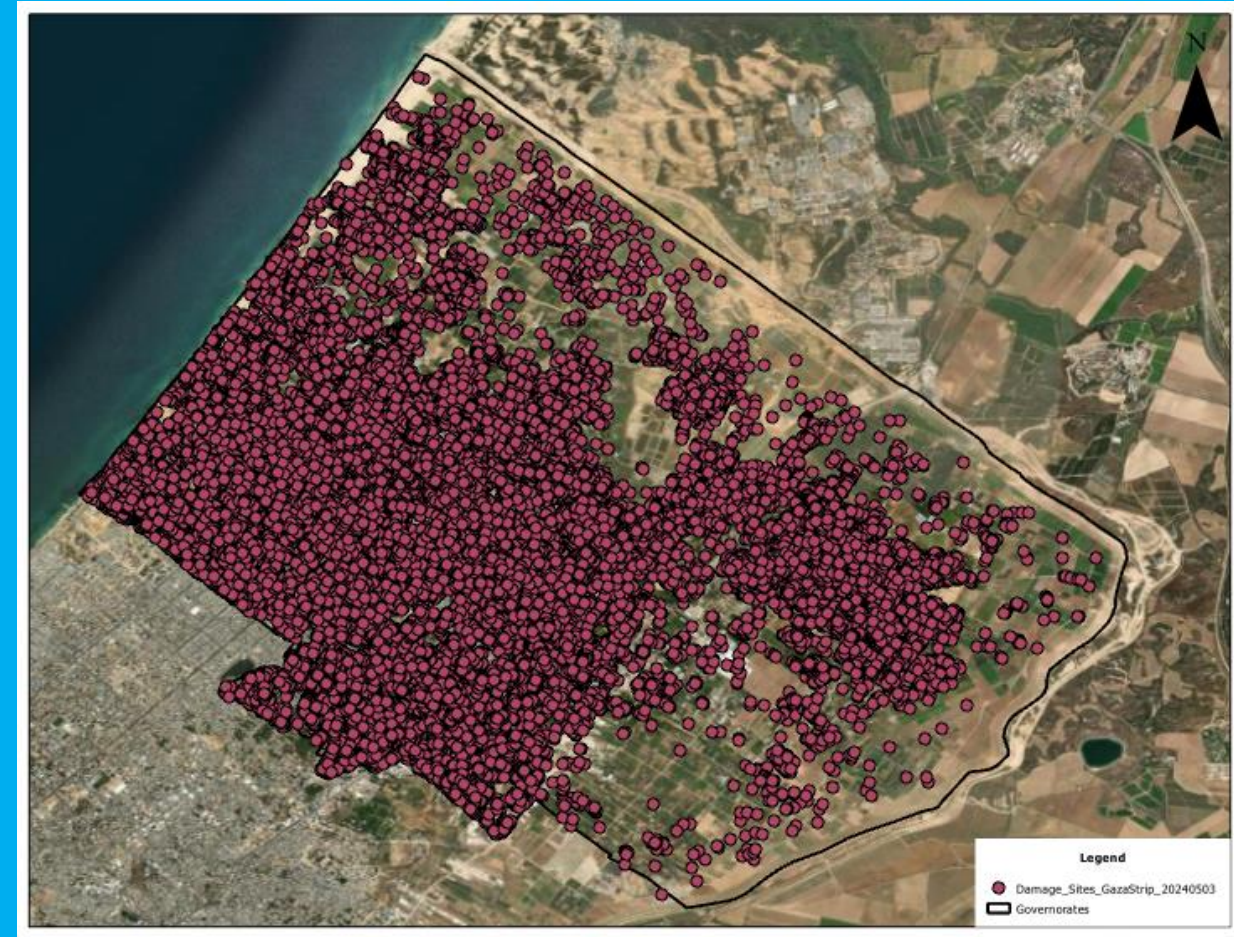


# Distribution of school buildings and Damaged sites per governorate

## North Gaza Governorate



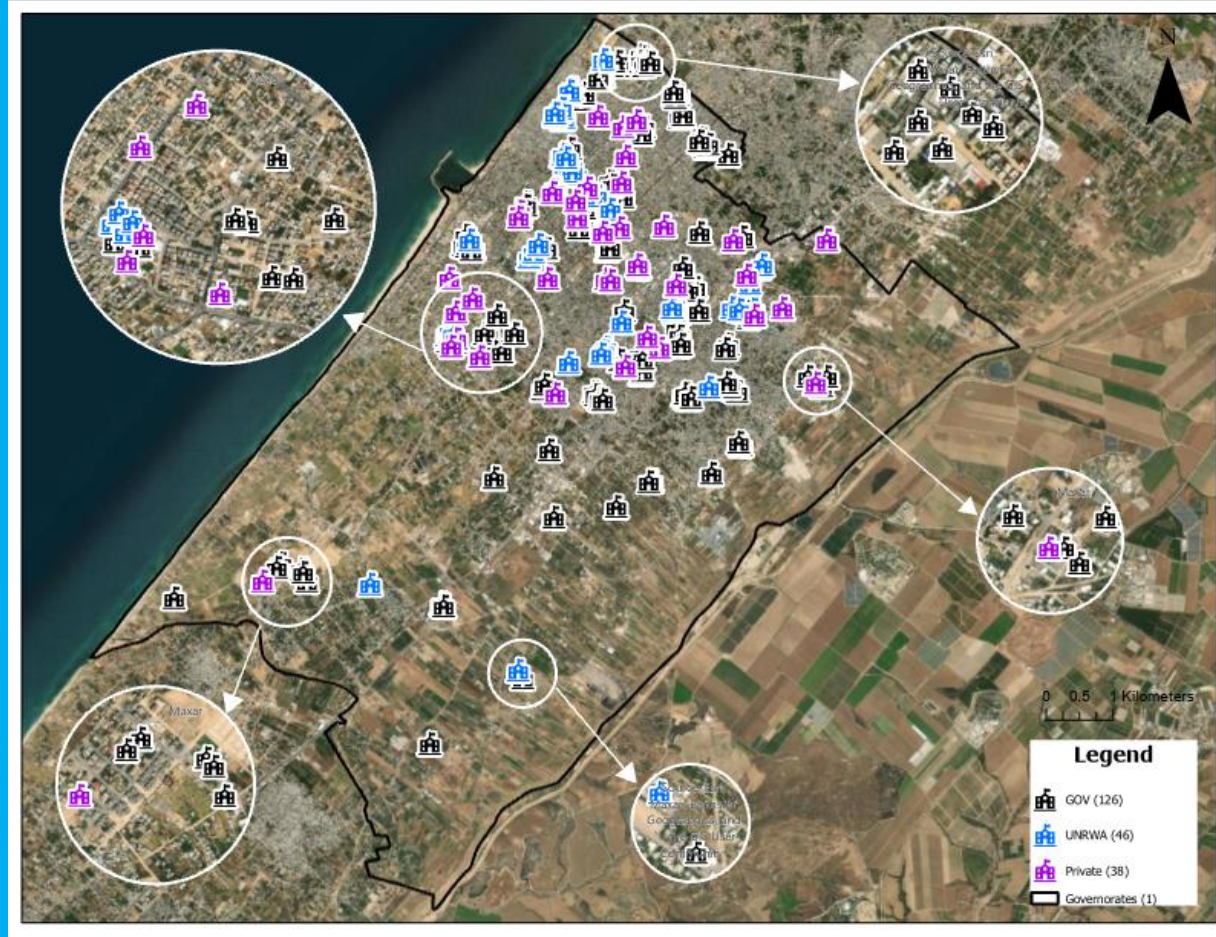
School buildings



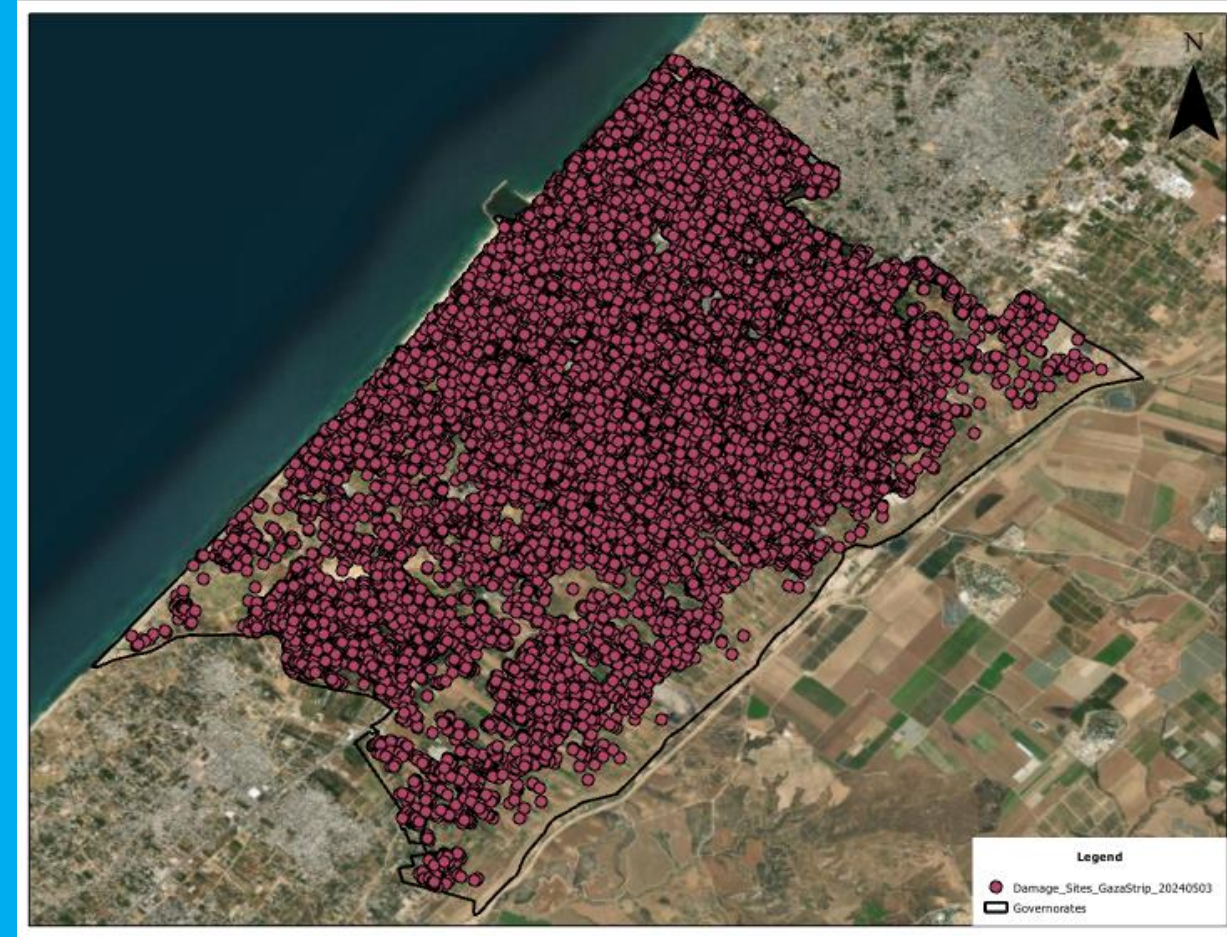
Damaged sites

# Distribution of school buildings and Damaged sites per governorate

## Gaza Governorate



School buildings

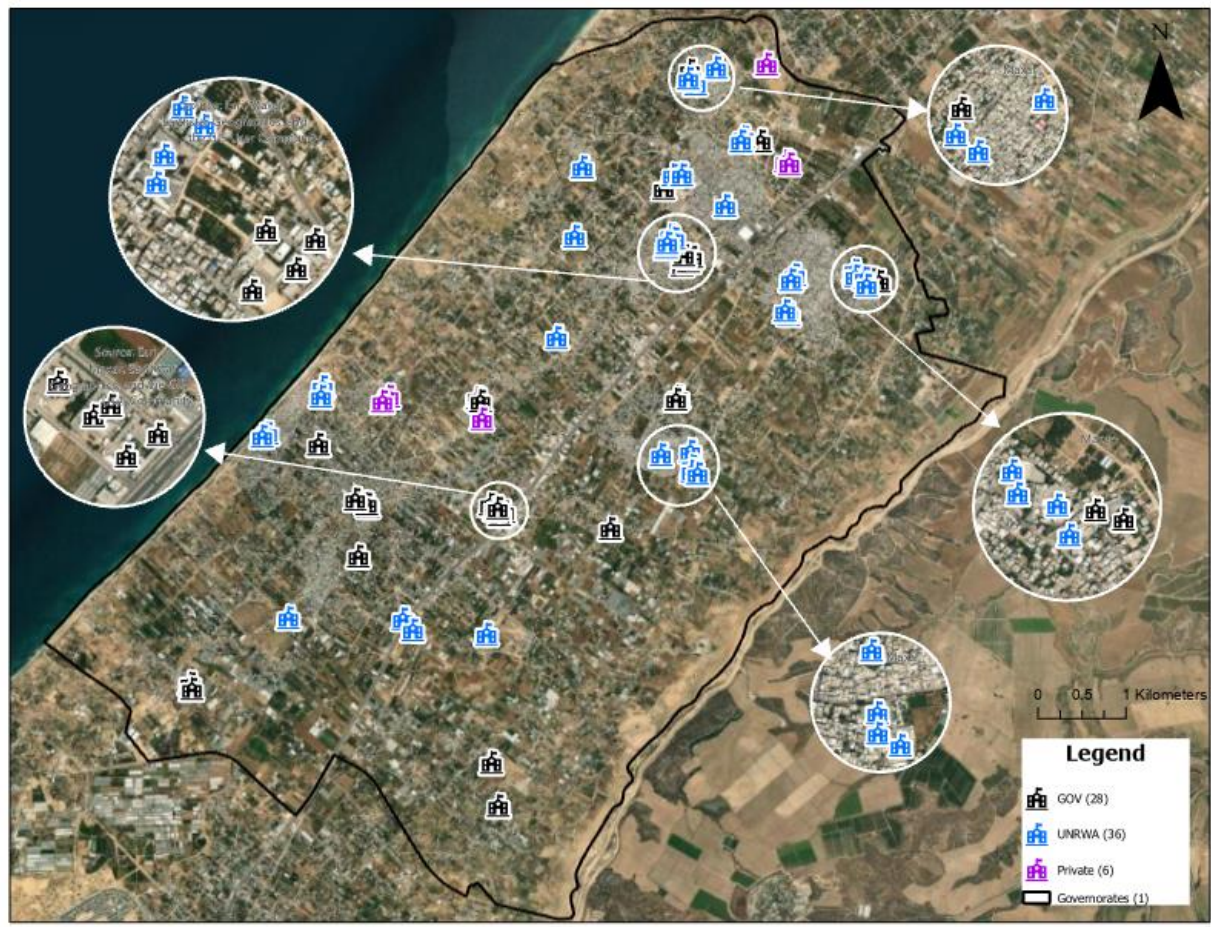


Damaged sites

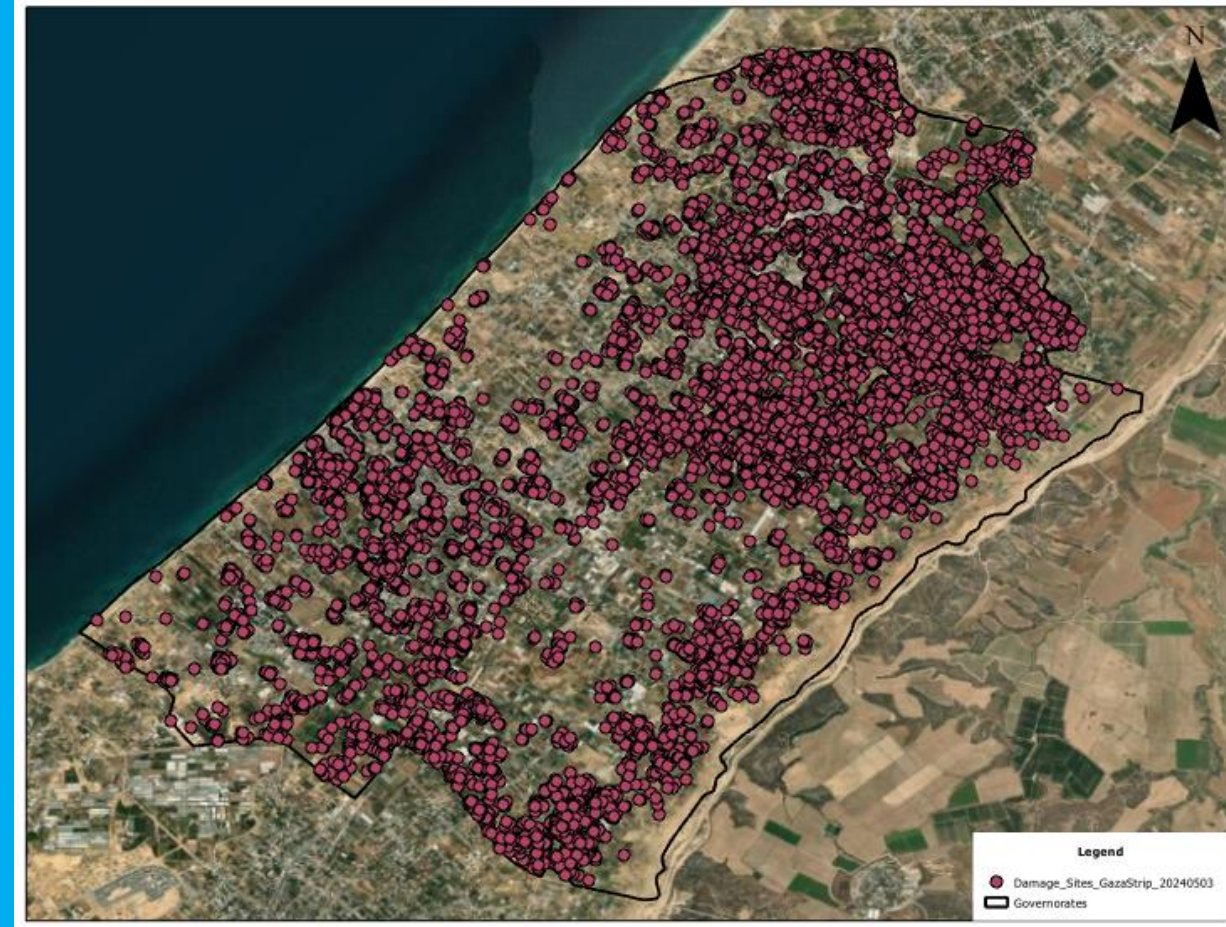


# Distribution of school buildings and Damaged sites per governorate

## Middle Area Governorate



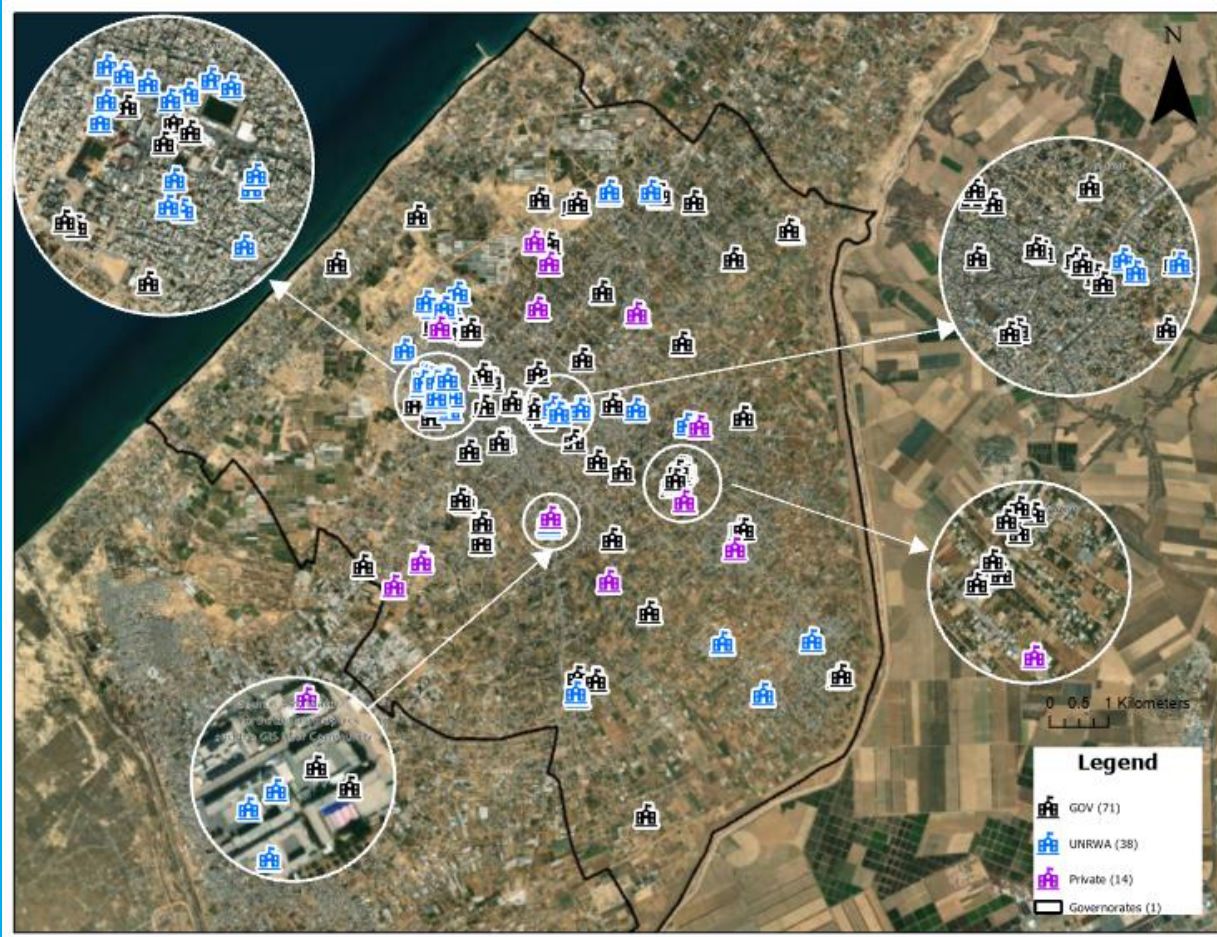
School buildings



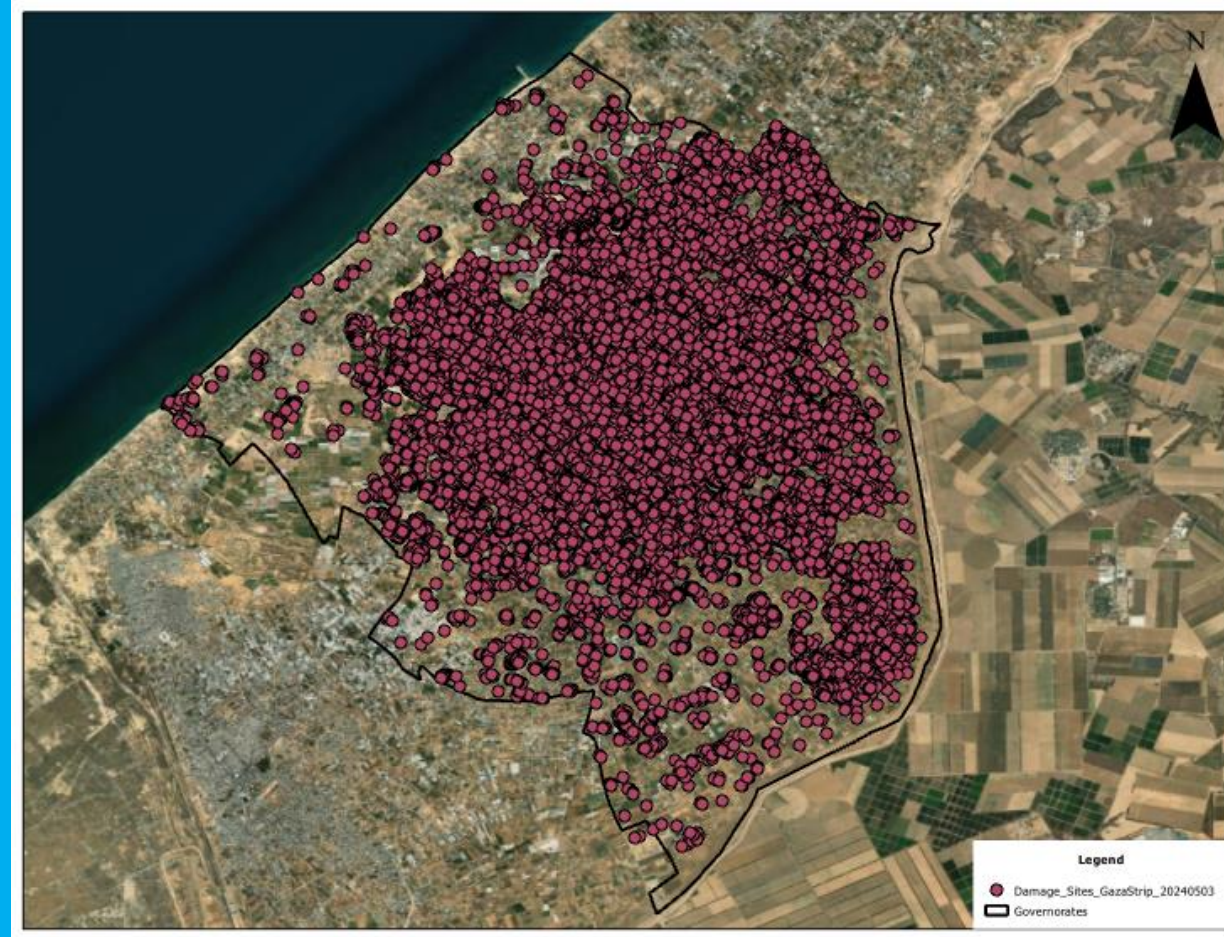
Damaged sites

# Distribution of school buildings and Damaged sites per governorate

## Khan Younis Governorate



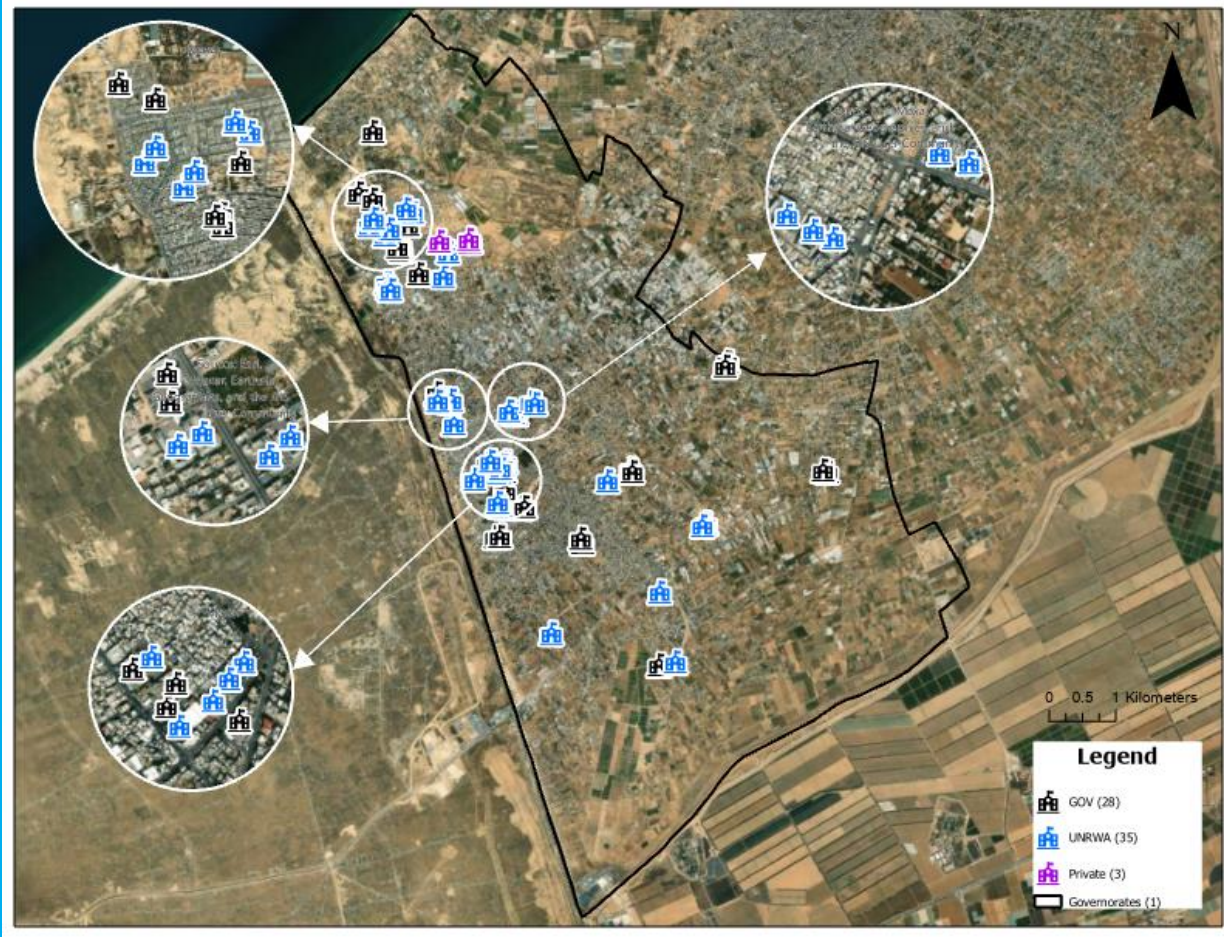
School buildings



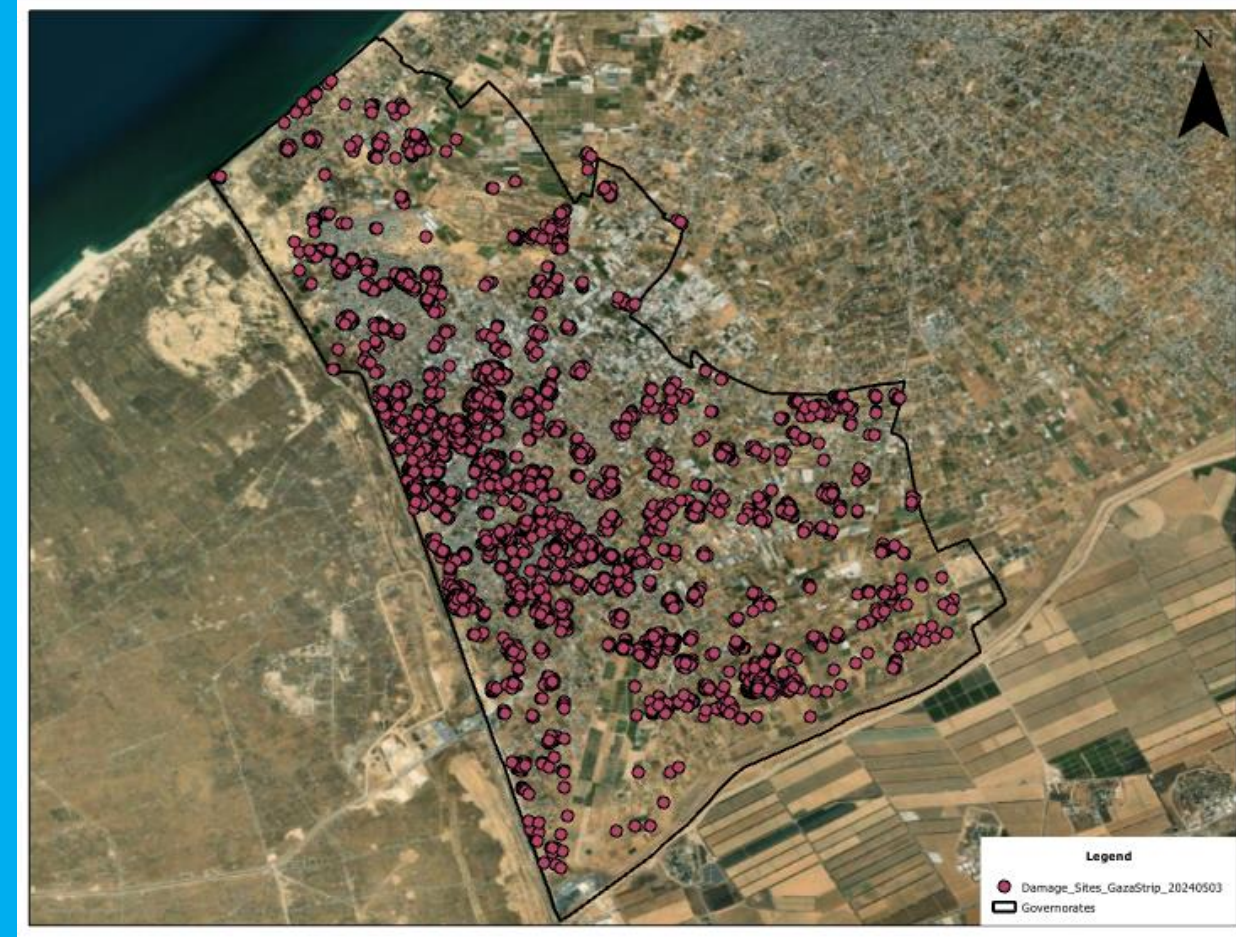
Damaged sites

# Distribution of school buildings and Damaged sites per governorate

## Rafah Governorate



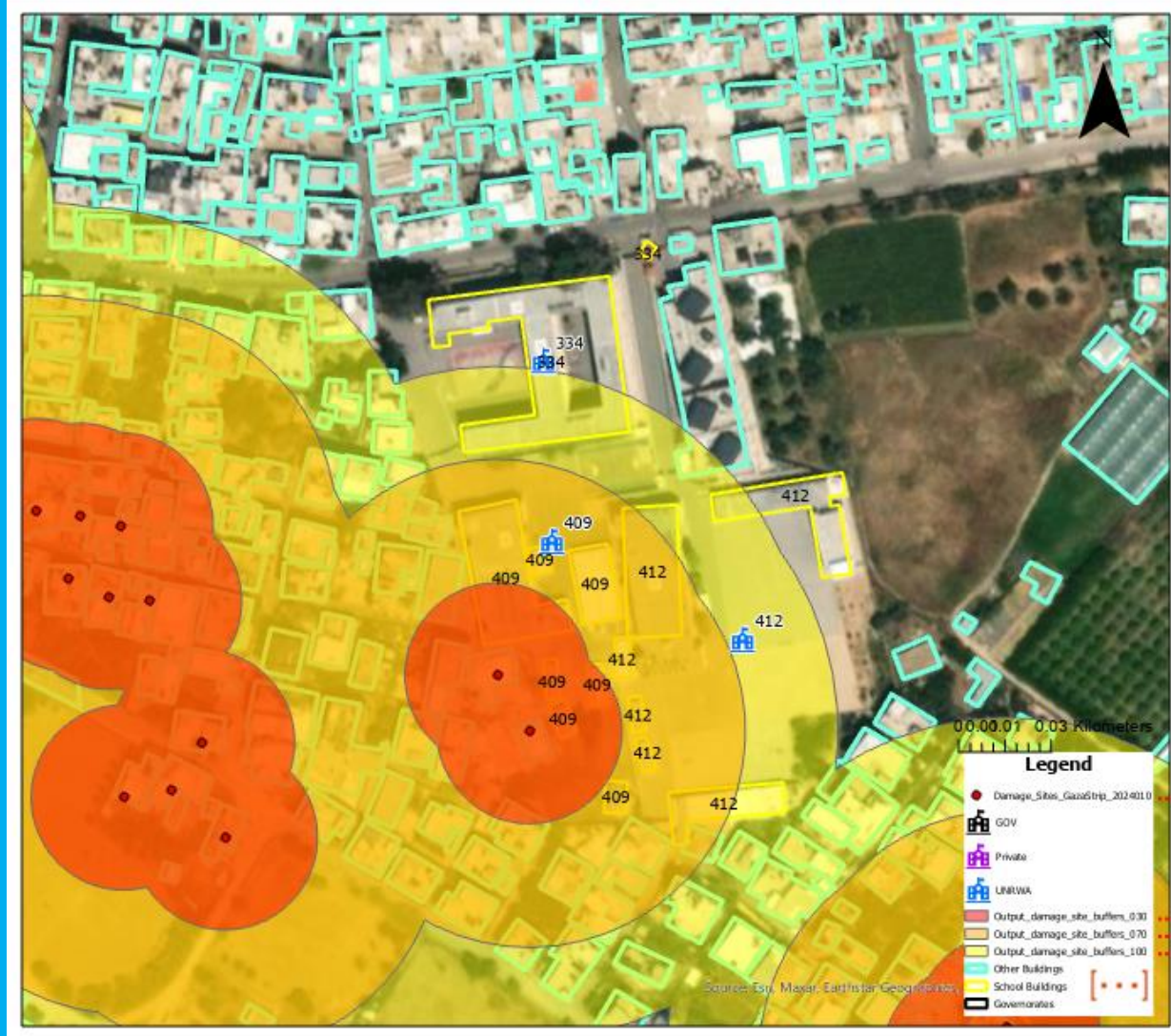
School buildings



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 **307** school buildings have been **hit directly** since 7 October 2023, this represents **54.5%** (a +6% increase from the previous reporting period) of the total school buildings in Gaza.
- Satellite-derived analysis found that at least **61** schools were **Totally destroyed** (2 schools more compared to the previous reporting period). Another **39** schools lost at least half of its structures.

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)	307	54.5%
<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)	123*	21.8%
<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)	67	11.9%
<b>Possible damage</b> (at least one damaged site has been identified within <b>70-100m</b> of the school buildings. This could indicate <b>minor damage</b> to school structures)	19	3.4%
<b>Unknown</b> (school buildings with no reported damage sites within <b>100m</b> . This could indicate that school structures have not sustained damage)	47	8.4%
<b>Total</b>	<b>563</b>	

\* **27** 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)
<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)	307	438
<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)	123	181
<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)	67	101
<b>Possible damage</b> (at least one damaged site has been identified within <b>70-100m</b> of the school buildings. This could indicate <b>minor damage</b> to school structures)	19	27
<b>Unknown</b> (school buildings with no reported damage sites within <b>100m</b> . This could indicate that school structures have not sustained damage)	47	66
<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)	58	132	21	94	2	307
<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)	27	54	19	13	10	123
<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)	9	18	16	8	16	67
<b>Possible damage</b> (at least one damaged site has been identified within <b>70-100m</b> of the school buildings. This could indicate <b>minor damage</b> to school structures)	-	3	7	-	9	19
<b>Unknown</b> (school buildings with no reported damage sites within <b>100m</b> . This could indicate that school structures have not sustained damage)	-	3	7	8	29	47
<b>Total</b>	<b>94</b>	<b>210</b>	<b>70</b>	<b>123</b>	<b>66</b>	<b>563</b>

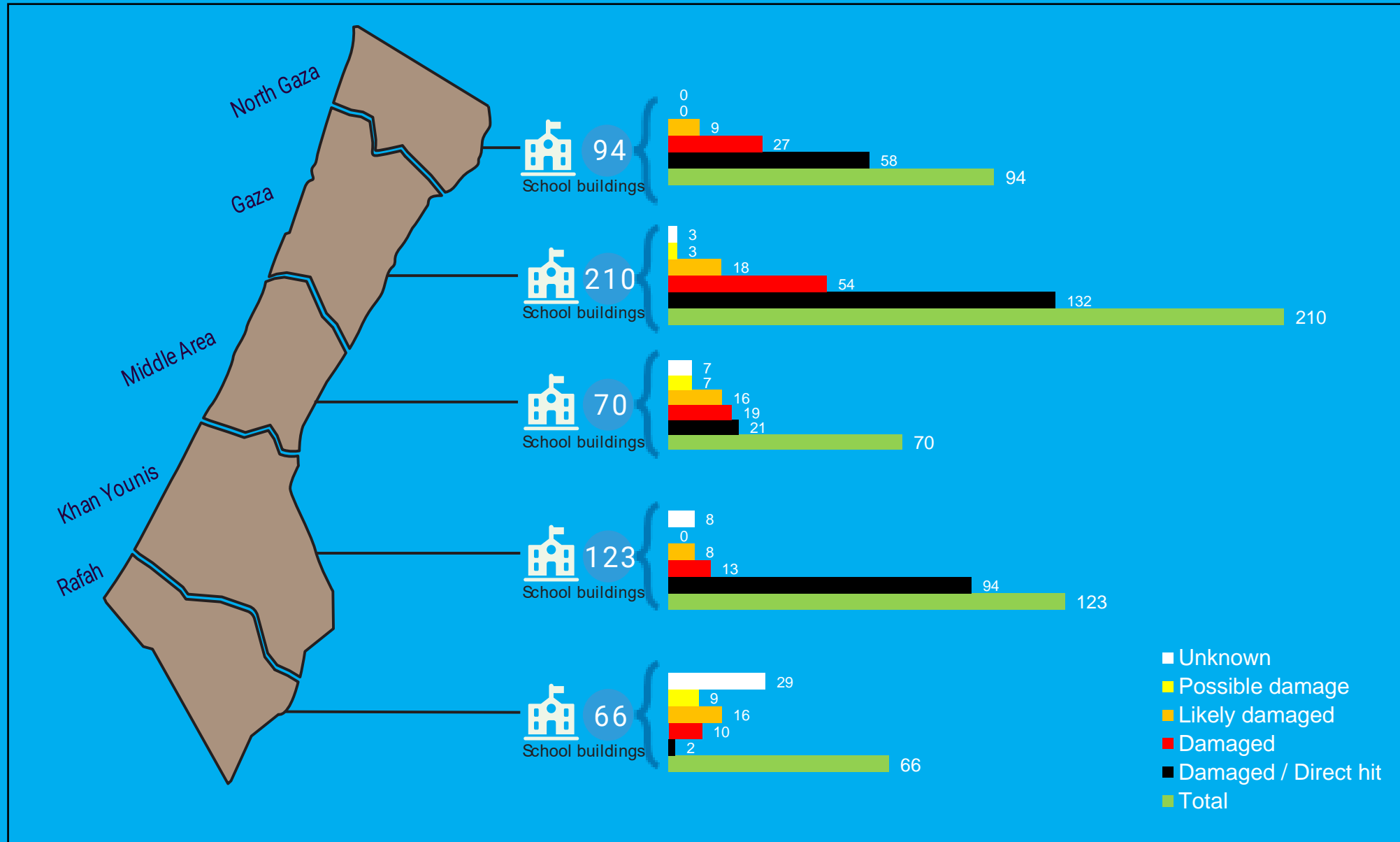


# Findings (damage per Governorate)

North Gaza governorate is the most affected with **90.4%** of its school buildings being either directly hit or **damaged**.

followed by Gaza governorate with **88.6%** of its total school buildings.

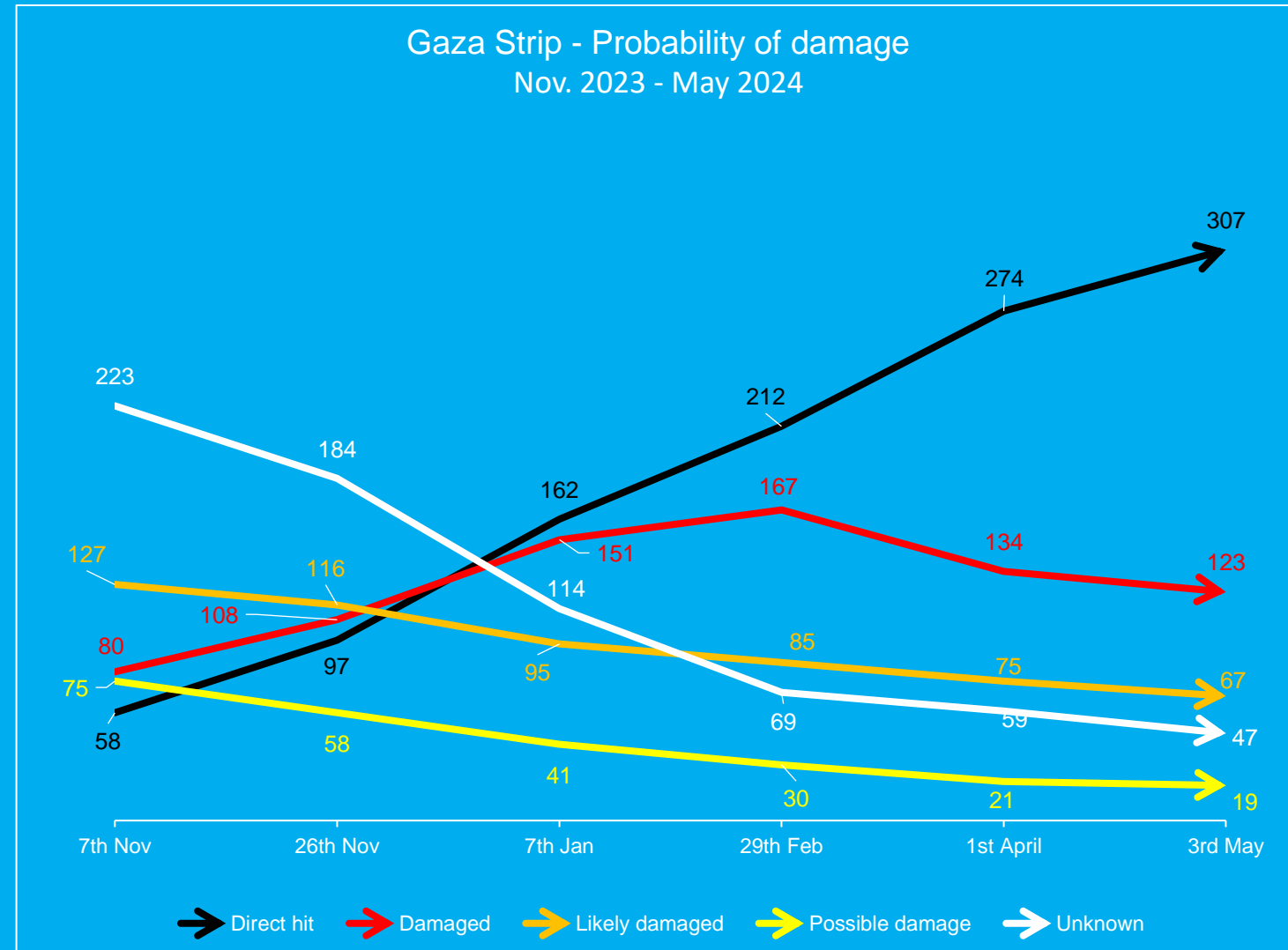
While **87%** of Khan Younis governorate school buildings are directly hit.



■ Unknown  
■ Possible damage  
■ Likely damaged  
■ Damaged  
■ Damaged / Direct hit  
■ Total

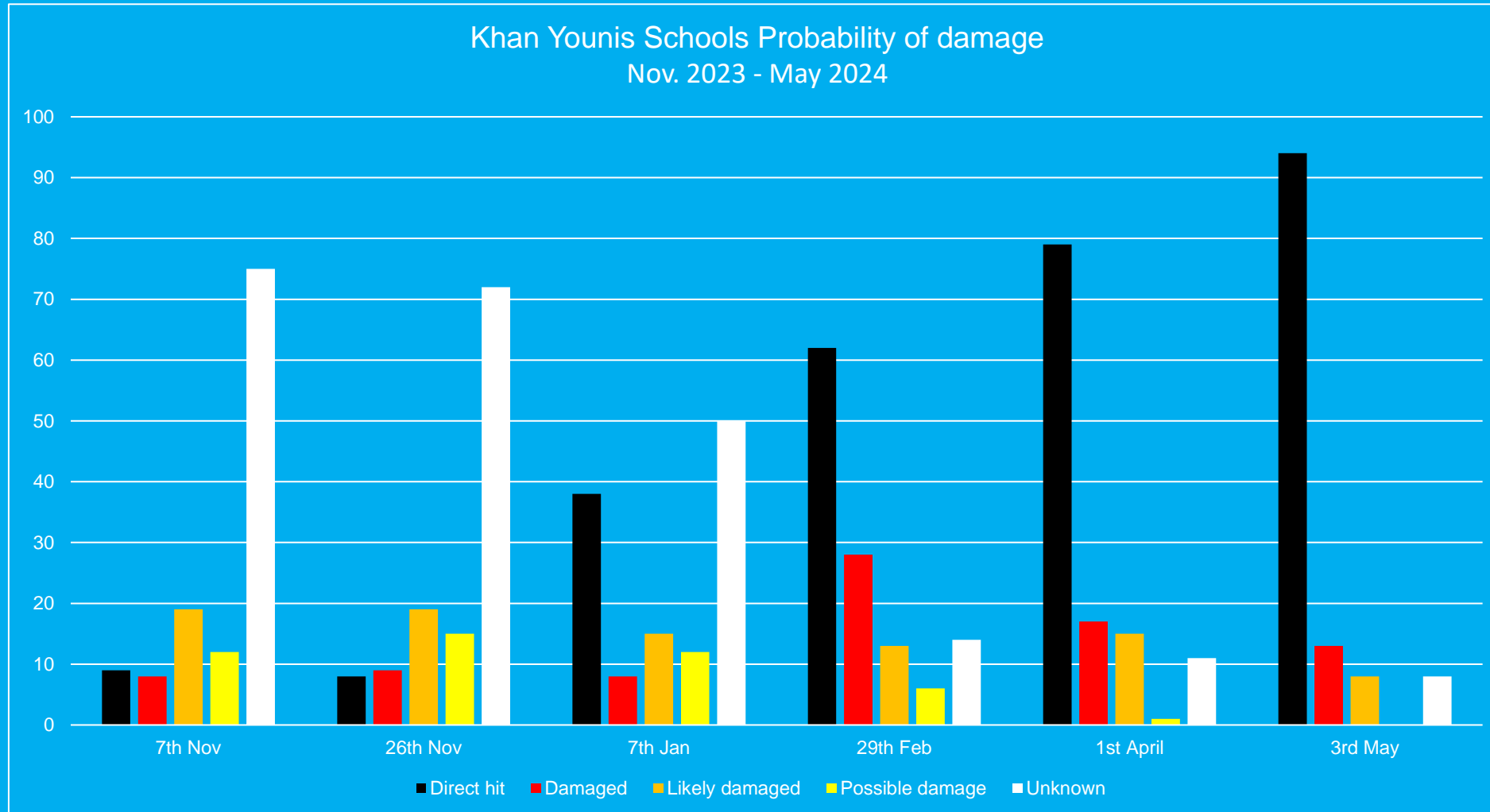
# Trends

- The spike in directly targeting schools continues throughout this escalation, the assessment shows that schools have been affected by damages several times, including 23 schools that had been classified as “**Damaged**” in the previous analysis on 1<sup>st</sup> April have been affected by additional hits during April and now classified as “Direct hit”.
- The assessment found that **307** school buildings have been Directly hit since 7 October 2023, this represents **54.5%** (a +6% increase from the previous reporting period) of the total school buildings in Gaza.

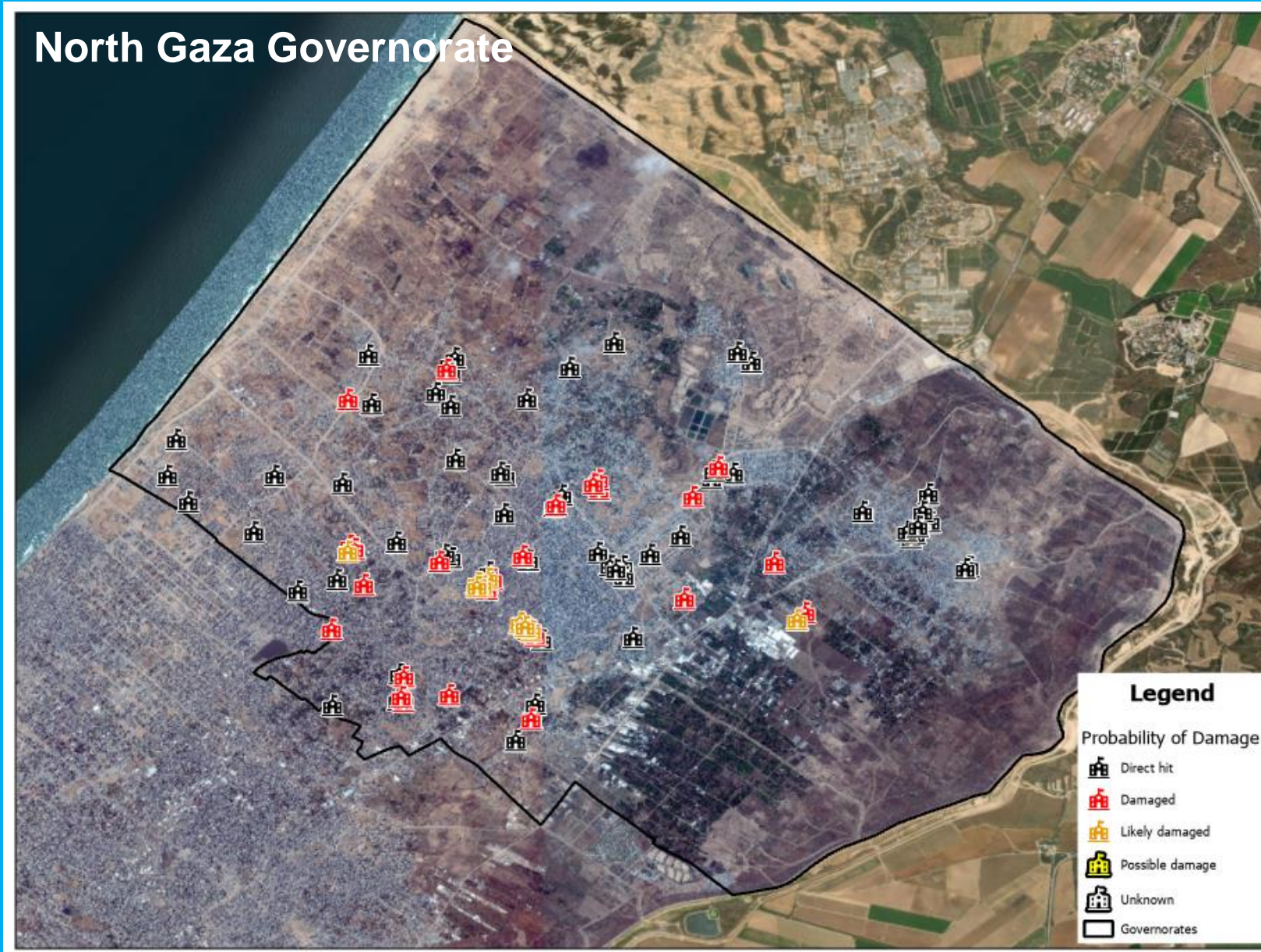


# Trends

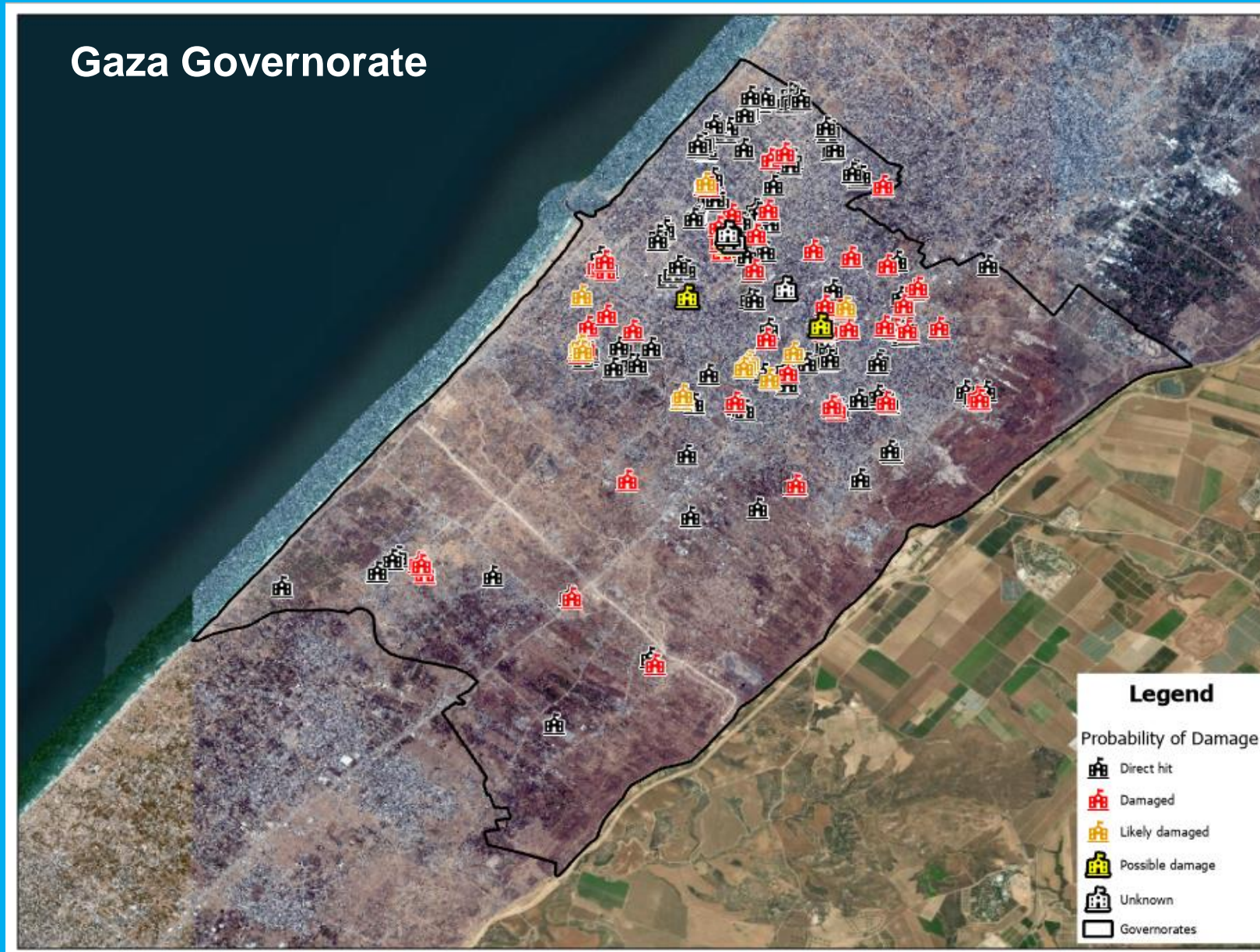
- Since the last damage analysis on the 1st of April, an additional **33** school buildings have been classified as **Directly hit**, 15 of them in the **Khan Younis governorate**.



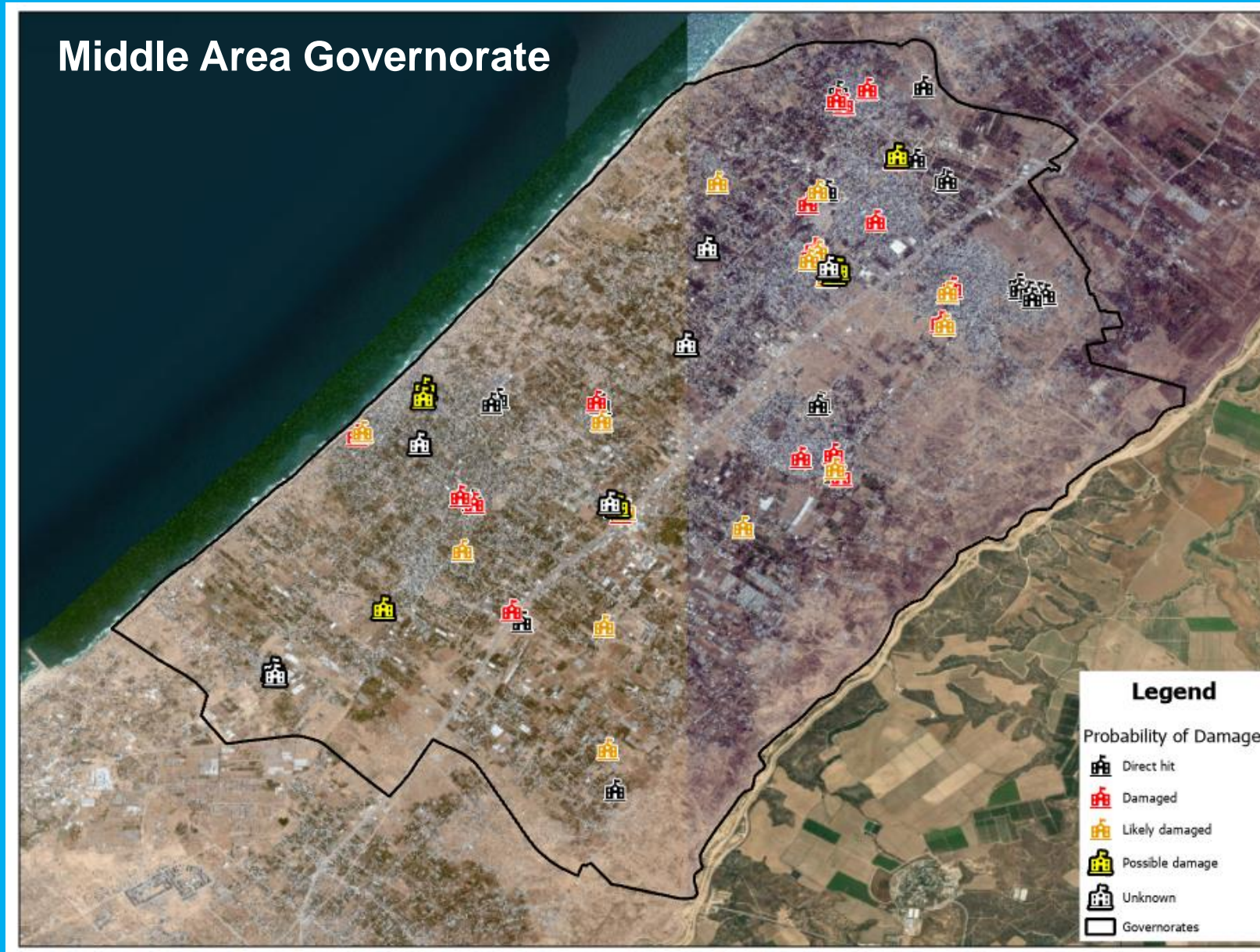
# Findings (damage per Governorate)



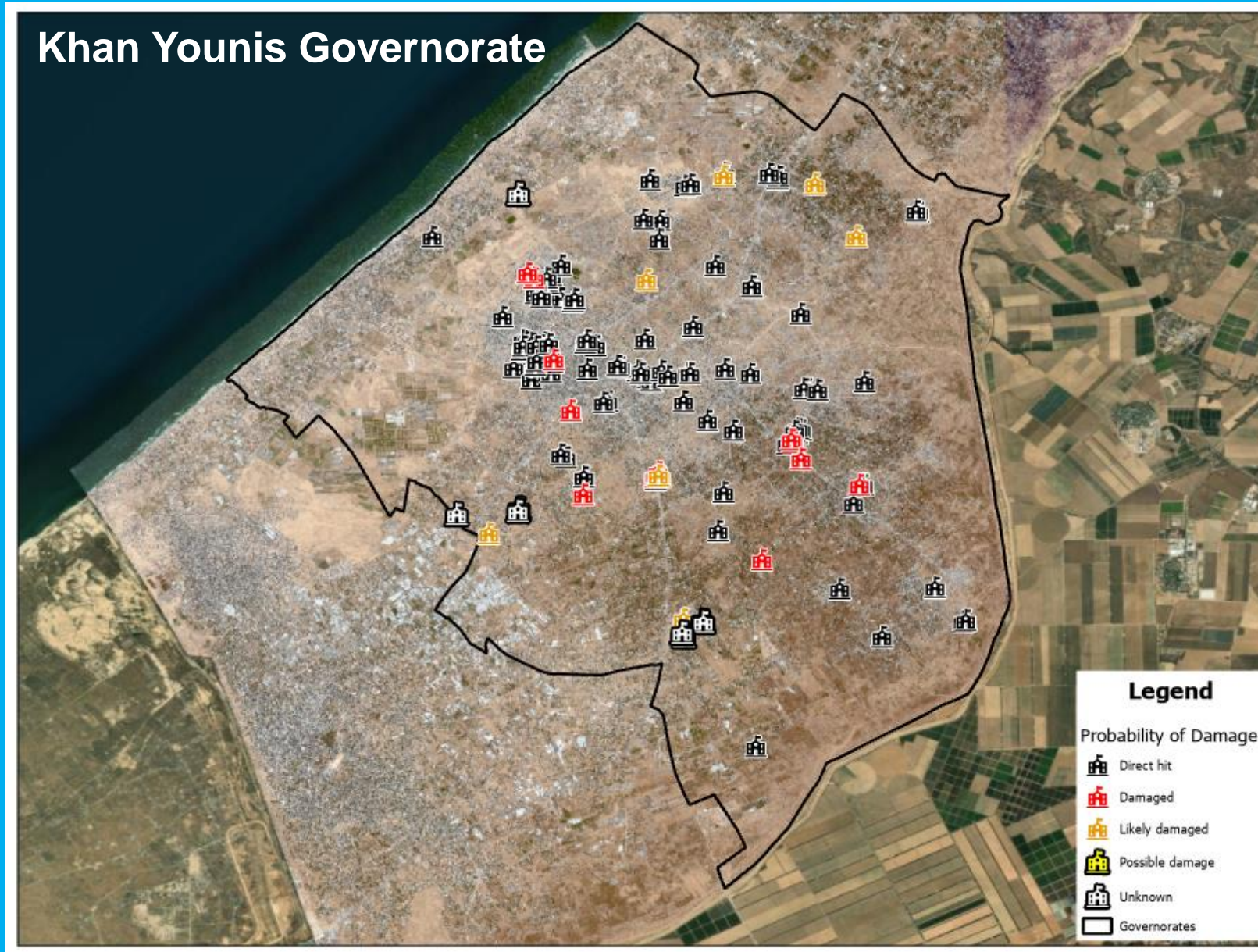
# Findings (damage per Governorate)



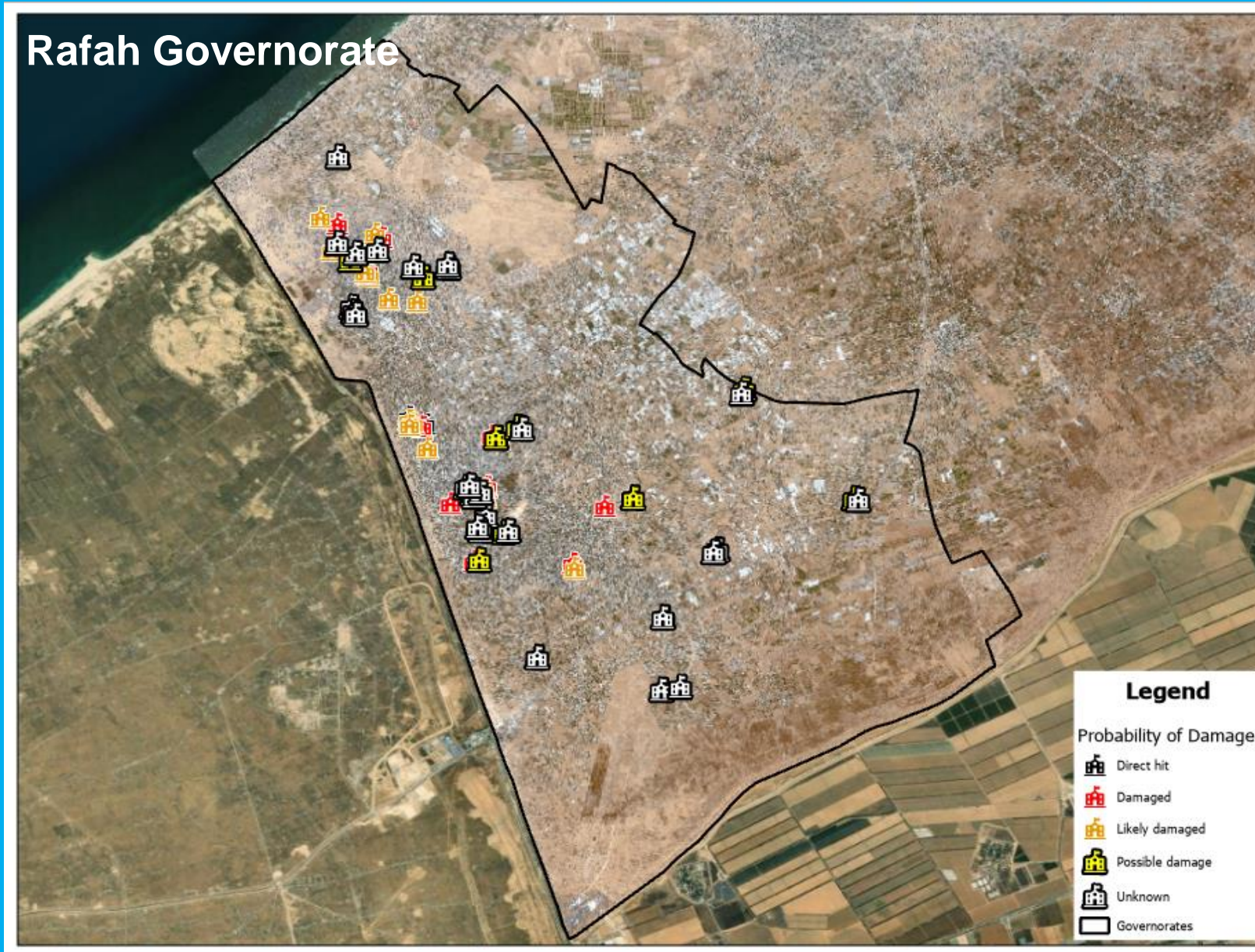
# Findings (damage per Governorate)



# Findings (damage per Governorate)



# Findings (damage per Governorate)





# Findings (damage per Type)

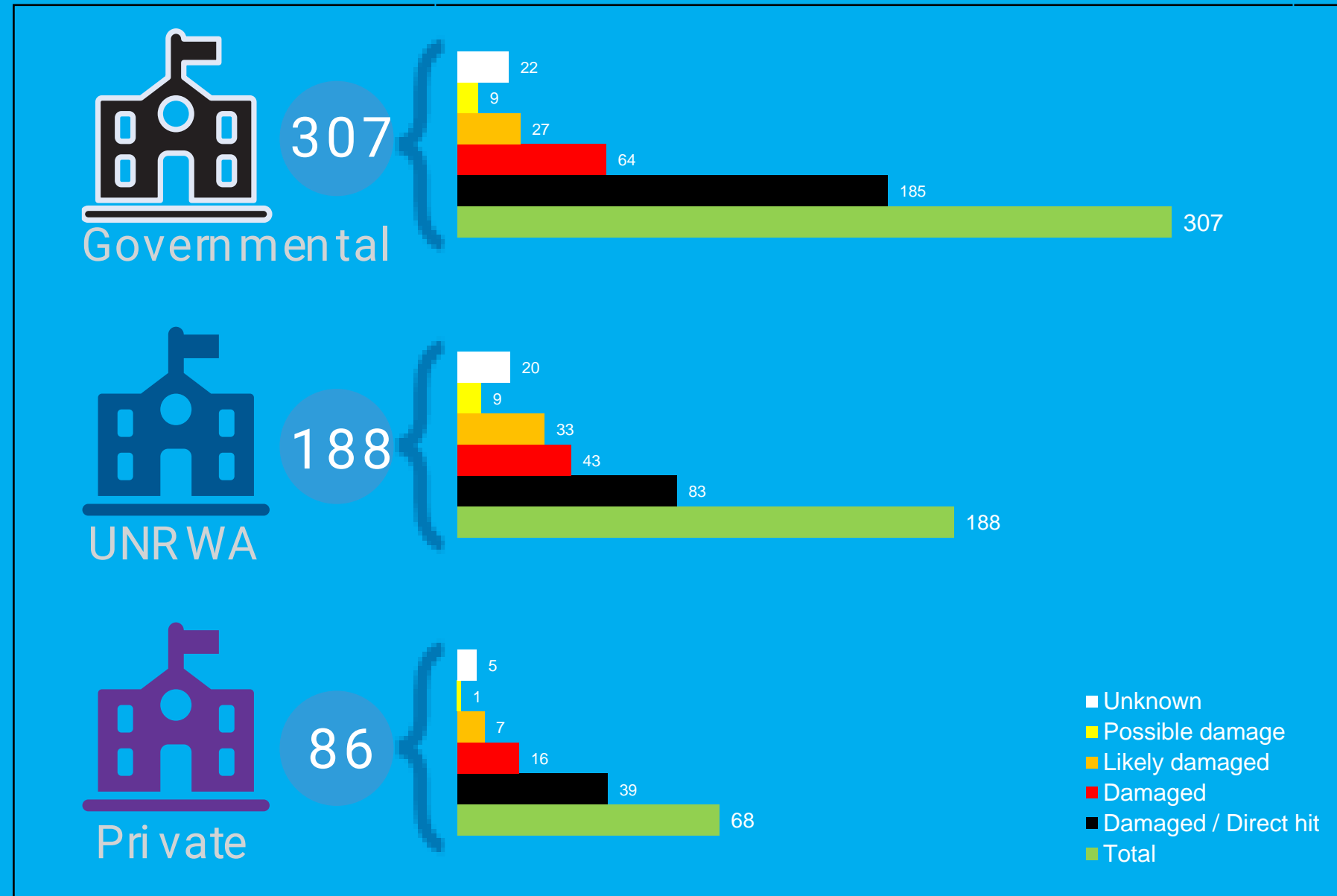
Probability of damage	Government	UNRWA	Private	Total (school buildings)
<b>Direct hit</b> (at least one school building has been <b>directly</b> hit and at least one damaged school structure has been identified within school premises)	185	83	39	307
<b>Damaged</b> (at least one damaged site has been identified within <b>30m</b> of the school buildings. This could indicate <b>severe damage</b> to school structures)	64	43	16	123
<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)	27	33	7	67
<b>Possible damage</b> (at least one damaged site has been identified within <b>70-100m</b> of the school buildings. This could indicate <b>minor damage</b> to school structures)	9	9	1	19
<b>Unknown</b> (school buildings with no reported damage sites within <b>100m</b> . This could indicate that school structures have not sustained damage)	22	20	5	47
<b>Total</b>	<b>307</b>	<b>188</b>	<b>68</b>	<b>563</b>

# Findings (damage per Type)

**81.1% (249)** of Governmental school buildings have been either directly hit or **damaged**.

**67% (126)** of UNRWA school buildings have been either directly hit or **damaged**.

**80.1% (55)** of Private school buildings have been either directly hit or **damaged**.



- **Students and Teachers:**

- The 307 school buildings classified as **Direct hit** previously served some 323,388 students and more than 12,227 teachers.
- The 123 school buildings classified as **Damaged** previously served some 135,024 students and more than 5,058 teachers.

- **Military use of schools**

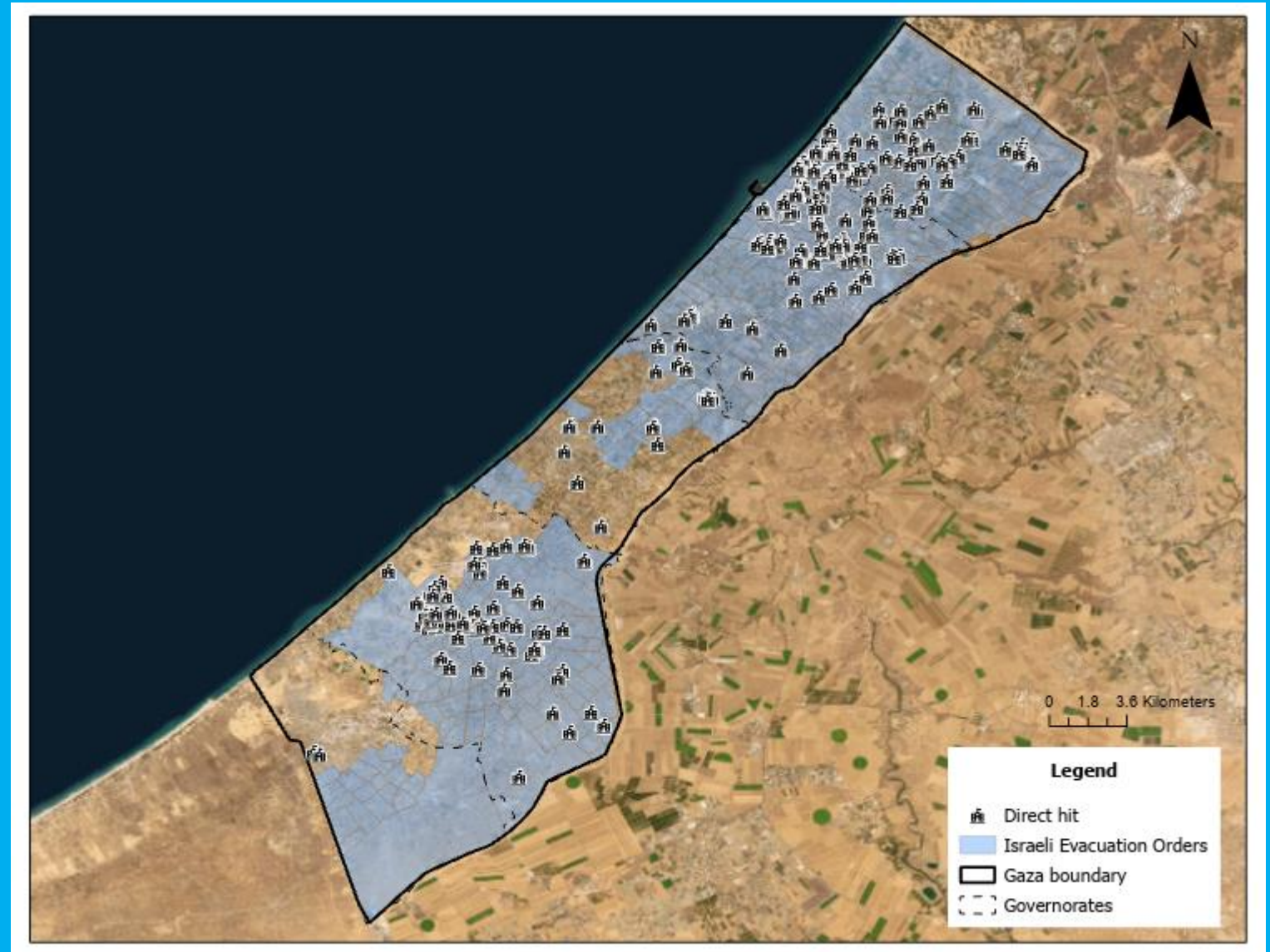
- The satellite-derived images provide evidence for military use of schools.

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

- Since the 7<sup>th</sup> of October, more than 345 school buildings have been used by IDP as shelters, the assessment results show that out of those school buildings, 238 are either **Directly hit** (158) or **Damaged** (80).

# Findings

- **296 out of the 307 (96.4%) 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 North Gaza and Gaza governorates (190 schools) are in the area targeted by the Evacuation Orders by the Israeli military**
- **91 out of the 94 schools Directly Hit in the Khan Younis 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 88.3% of schools sustained some level of damage to their buildings, this includes **Direct hit**, **Damaged**, and **Likely damaged**.
- At least **76.4%** of schools in Gaza will either need full reconstruction or major rehabilitation work to be functional again.
- **29.3%** of **Directly hit** and **Damaged** schools are UN-run schools through UNRWA.
- **69%** 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



Military tracks and activity

# Findings: Schools as IDP Shelters

## Rafah Governorate





\* Al Shouka Secondary Girls School - Rafah/Shokat as Sufi

Before

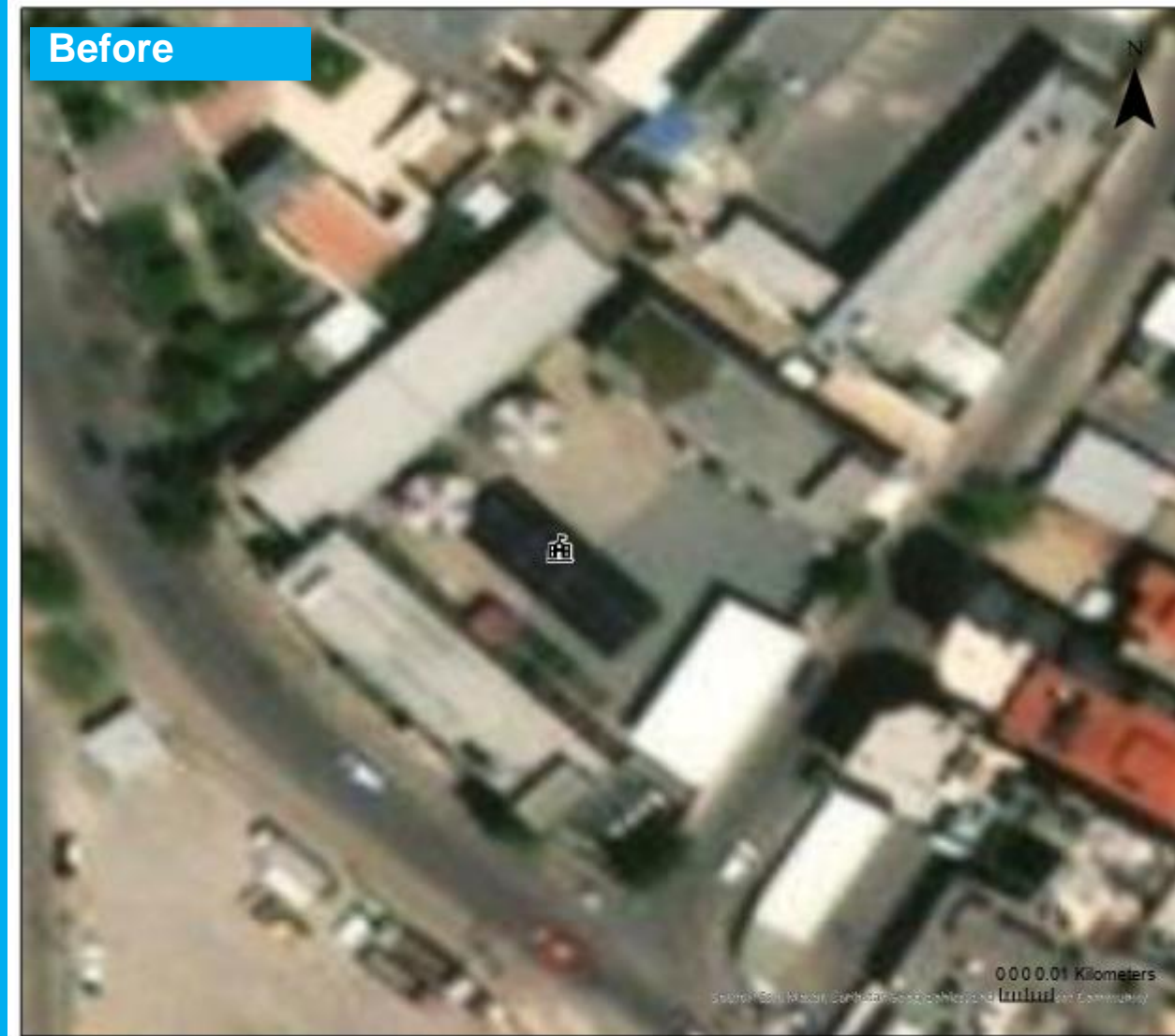


After



\* Al-Shaimaa Basic Secondary School - Beit Lahiya/Fad'os

Before



After



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

Before



After



\* Al Orouba Secondary Girls School - Middle Area/An Nuseirat Camp

Before

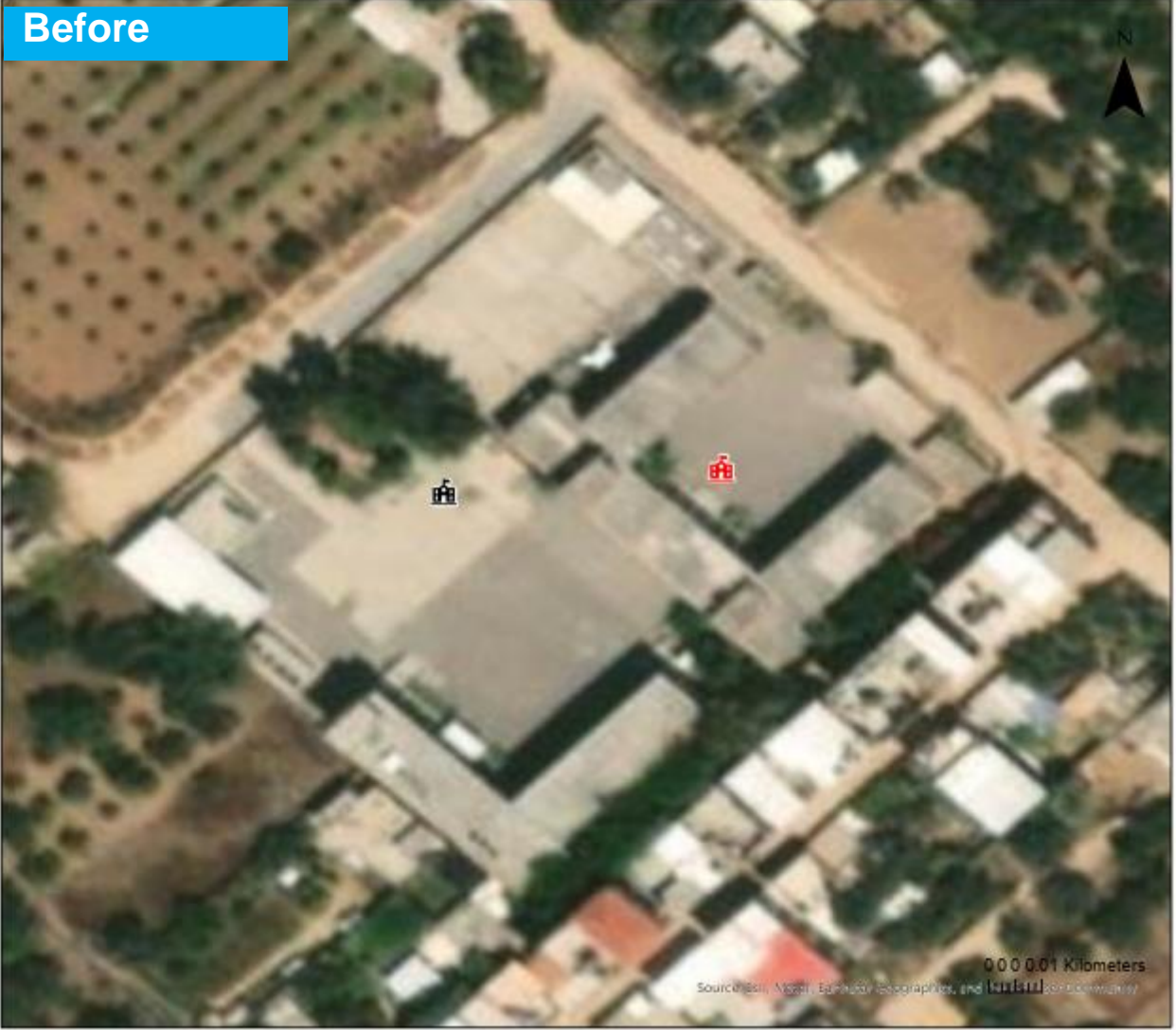


After



\* Al-Ma'ari Schools - Khan Yunis/Al Qarara

Before



After



\* Bessan & Tounes Schools - Gaza/Az Zaitoun



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SCAN ME 

