Uninhabitable? The reverberating public health and environmental risks from the war in Gaza
Gaza pre-Oct 7: major NR challenges in a degraded environment

16-year blockade
Past military attacks
Groundwater pollution
Salinization of aquifers
Climate change
Low means for environmental governance
HOW? Open-source research

- existing data from various researchers and organisations
- visual analysis of satellite imagery
- statistical/machine learning analysis of satellite imagery
- news, social media, videos, pictures
- interviews with water specialists and humanitarians working in Gaza, local partners

Bring that together and verify
Direct impacts
On water resources
Attacks on the Wadi Gaza Wastewater Treatment Plant

Gaza Strip

Visible impact crater from bombs on solar energy field

Airbus Pleiades November 3, 2023
Indirect impacts
On water and health
**Damage to Agricultural Lands**

Gaza Strip, Occupied Palestinian Territories

**Destroyed fields and orchards**
- 31.482521, 34.480071
- 4 Dec 2023, Planet

**Destroyed greenhouses**
- 31.559900, 34.522575
- 4 Dec 2023, Planet

**Legend**
- 
  - Cropland
  - Orchard
  - Greenhouse
  - Woody vegetation
  - Built-up: low intensity
  - Built-up: high intensity
  - Roads
  - Barren
  - Water
  - Destroyed orchard or damaged field
  - Damaged greenhouse

**Sources**
- Likely land cover and likely agricultural damage: He Yin (2023) Kent State University, based on Sentinel-1, Sentinel-2 and PlanetScope imagery between 7 October and 16 November 2023
- Likely ETN damage (images): Jahan Van Den Hoek and Corey Scher (2020) Oregon State University, based on Sentinel-1 radar, OpenSceneMap and Microsoft building footprint data between 5 October and 22 November 2023
- Waterways: Open Street Map (2023)
- Gaza Municipality: OCHA, UN (2023)
- Gaza municipality names: Gaza Housing Council (2019)
- Satellite imagery: Planet (2023) 4 December 2023
- Background imagery: Google Satellite and Flinders Marine Institute (2019)

**Vehicle tracks**

**Craters**
Conclusions

Massive use of explosive weapons in populated areas and rural communities
→ massive human suffering
→ reverberating environmental risks in the short, medium and long-term
→ Health impacts
→ Jeopardizing livelihoods and ecosystems Palestinians depend on

Documenting!
→ new tools are driving decision-making more and more
→ Strengthen accountability over armed conduct

What now? – near term

Immediate and permanent ceasefire
• Adhere to the Geneva List of Principles on the Protection of Water Infrastructure
• Stop heavy explosive weapons in populated areas in the Gaza Strip

Long term
• Strengthen international regime to protect the environment in armed conflict → to protect civilians
• Post-conflict BBB (greener):
  - climate consideration in reconstruction
  - invest in clean-up, remediation and restoration
  - need full-scale environmental analysis