Ecocide in Gaza: The environmental impact of Israel's war on Gaza

October 10, 2024

After one year of war in the Gaza Strip, international humanitarian organizations have been unanimous in their assessment of a grave situation, with some identifying genocide. An extraordinary demolition, the displacement of millions of people, and immense infrastructural destruction have all occurred. The war has affected livelihoods and public health, sanitation services, and all levels of education. The basic needs for life in Gaza – accommodation, water, food, healthy environment – are no longer accessible for the entire population. What follows in this document is a preliminary assessment of the environmental impact of Israel's war on Gaza that has been produced by a team of researchers working through a collaboration between the Palestinian environmental NGOs Network and Newcastle University in the UK.

Environmental Impacts of the war

Irrigation water salinity

The field team report an increase in groundwater salinity in Almwasi- AlQarara and Khanyounis. Farmers report that the olive nursery farms used to be irrigated from groundwater well with salinity 1800 mg/l. Currently, due to the over pumping of groundwater from Almawasi area to supply the Internally displaced people (IDPs) with water, the well salinity reaches 4000 mg/l. Thus, newly planted olive trees have died. Some other sensitive vegetables do not grow as usual due to the increased salinity in the irrigation wells. Samples from irrigation well from vegetable farms and greenhouses showed increase in the salinity from 1300 mg/l to 2200 mg/l with 5 months of the war.

Important: Providing farmers with desalinated water should be considered to be mixed with brackish wells to keep the agricultural sector production.

Soil texture and structure

From the field observations:

- Intensive bombing:
- causing complete burning and deterioration of soil.
- killing trees and deforming fruits.

- Explosions temperature 2000^{O}C Killing soil organisms
- Burning organic matter (complete loss of fertility)
- The soil was destroyed or scattered as dust in the air (complete loss of soil).
- Effect of heavy machinery (bulldozing): Deterioration in crop health and density can be observed due to the impact of activities such as bulldozing, heavy vehicle activity, shelling, shelling and other conflict-related dynamics.
- Compacting the surface soil and losing its permeability
- Complete drying and loss of moisture
- Converting many elements from the soluble form to stable compounds (insoluble and insoluble by the plant)
- Destruction of the surface layer: The stratigraphic succession in the bulldozed lands has been destroyed, which means an irreparable loss.
- Turning the soil and causing the transfer of the lower saline layers to the soil surface and thus harming the growing plants.

Important: replacement of soil top layers with organic and minerals rich soil in addition to intensive tillage is required.

Soil sampling of heavy and toxic metals

Sampling approach is proposed to assess the heavy and toxic metals (Cr- Ni- Cu- Co and Pb) due to the intensive bombing in the agricultural land considering the geographical distribution and the soil texture.

Important: Nuclear radiation has to be also considered but there are political restrictions, international interventions are required in this concern. Plant leaves and fruits also will be tested for the same elements.

Important: Vegetables and fruits that are cultivated in the eastern border and in the intensively bombed urban areas required to be monitored and tested before human direct consumption.

The livestock sector is completely destroyed due to unavailability of fodder and the accessibility to the green areas in winter and spring seasons. This affects the availability of organic fertilizers. Farmers now tend to use unlabeled fertilizer, pesticides, and herbicide containers from the black market.

Important: Interventions from agricultural local and international NGOs are required to follow up and monitor the uses of farm input.

Solid Waste

One of the most destructive and direct consequences of the Israeli war on the Palestinian environment. The field team monitored more than 63 unregulated landfills throughout the Gaza Strip containing a total of 1.2 million tons of solid waste. The primary reason for the formation of these unregulated landfills is the Israeli Army's decision to prevent access to the recognized landfills, as they all now fall in the 'security zone' demarcated by Israeli forces and, therefore, are strictly inaccessible. The unregulated landfills have cropped up near camps for internally displaced people. Further worsening the situation is the almost complete collapse of the system of gathering and processing solid waste due to the targeting of municipal garages, trucks and vehicles by the Israeli Army, coupled with the severe shortage of fuels, oils and spare parts needed to maintain vehicles due to the Israeli blockade.

The continued accumulation of solid waste in unregulated landfills besides camps for internally displaced people represents an imminent public health disaster as a source of transmitted diseases, whether through direct contact with children or adults, or through insects. The situation is likely to worsen with the onset of winter and the potential for these pollutants to travel to nearby camps.

We, the Palestinian civil society network and researchers at Newcastle University, urgently appeal to all environmental and human rights organizations to pressure the Israeli authorities to allow access to sanitary landfills and to bring in the necessary equipment and materials to improve the collection and processing of solid waste and to urgently dispose of all unregulated landfills.

Wastewater

Our field team monitored more than 72 ponds of untreated wastewater, containing around half a million cubic meters of untreated wastewater. The primary reason for the formation of these ponds is due to the Israeli Army's destruction of several sewage collection points, as well as the cessation of several pumping stations from working, whether due to a lack of maintenance or the shortage of fuel after the electricity shutdown in Gaza.

It is important to emphasize that all wastewater treatment facilities in Gaza are no longer functioning due to the direct targeting of them by the Israeli Army leading to partial or full destruction. This is has resulted in widespread flooding of wastewater at the three primary treatment plants in East Gaza. This is has also led to an accumulation of wastewater in lowland areas and in ponds designated for the collection and filtering of rainwater such as the Sheikh Radwan pond in Gaza City. Part of this untreated water is also discharged through emergency lines at natural slopes in 9 discharge points to the sea.

Internally displaced people in the 'security-zone' as demarcated by the Israeli Army have begun using sceptic tanks to dispose of raw sewage. The daily amount of raw sewage that seeps into the groundwater in the security zone in the southern Gaza Strip is 10,200 cubic meters per day.

Unfortunately, the environmental threat has turned into a credible danger as several waterborne diseases such as hepatitis, vomiting, yellow fever, trachoma, malaria, cholera, etc. have emerged. The Ministry of Health reported that more than 50% of children are infected with Hepatitis A and samples collected from sewage water showed the presence of polio virus.

With the onset of winter, the risk of flooding will increase which will spread sewage water among displaced people who will be particularly exposed, especially since most of the rainwater collection ponds that were created to recharge the groundwater are currently used for sewage water.

Water supply and pollution

Currently, displaced people are provided with no more than 3 liters of drinking water per day. Seawater desalination plants and water coming from the Israeli company Mekorot are the most important sources of drinking water currently available in the Gaza Strip.

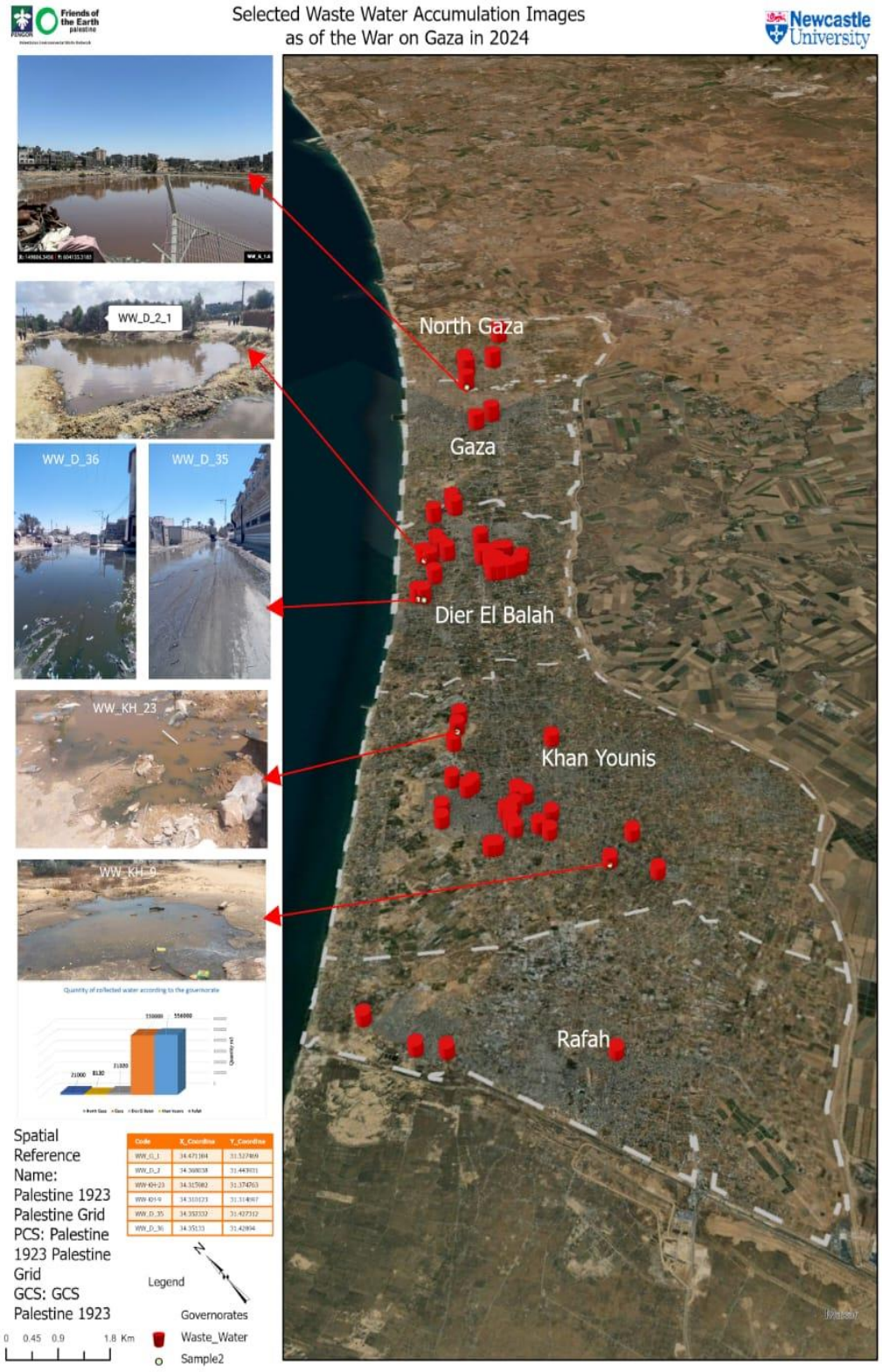
The water available for other purposes has decreased from 80 to less than 20 liters per person per day. The groundwater reservoir is the main source of this water, whether through some municipal wells that are still operating or through some agricultural wells and private wells.

We, the Palestinian environmental NGOs Network and researchers at Newcastle University, are sounding the alarm. The results of the biological examination that we conducted this week on 20 water samples from areas adjacent to solid waste landfills in the Central governorates and Khan Yunis reveal serious contamination with total and fecal coliform bacteria, which confirms the arrival of untreated sewage water and highly toxic leachate resulting from solid waste to the groundwater reservoir and thus the transfer of these dangerous pollutants directly to the population.

While we shed light on this serious pollution, we emphasize the need to take measures to monitor all groundwater wells and take strict measures to sterilize the water extracted from these wells by adding chlorine in sufficient quantities to sterilize this water.

Annex # 1: List of maps


Selected Solid Waste Accumulation Images as of the War on Gaza in 2024
Friends of the Earth palestine
Newcastle University
SW_D_1_1
SW_D_8_1
SW_KH_1_2
SW_KH_2
North Gaza
Gaza
Dier El Balah
Khan Younis
Rafah
Spatial Reference Name: Palestine 1923 Palestine Grid
PCS: Palestine 1923 Palestine Grid
GCS: GCS Palestine 1923
Legend
Governorates
Solid_Waste
0 0.45 0.9 1.8 Km



War and the geos: the environmental legacies of militarism

Project Website: www.warandgeos.co.uk

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Selected Drainage Points Images as of the War on Gaza in 2024

Spatial Reference Name: Palestine 1923 Palestine Grid
PCS: Palestine 1923 Palestine Grid
GCS: GCS Palestine 1923

Legend

Governorates

Pumped_Waste_Water

0 0.5 1 2 Km

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Results of Samples Feacal Coliform pollution_Oct 2024

Data Collection Date: Up to First of October 2024

Legend

- DH&KH
- Feacal_Caliform_not_Poll
- Feacal_Caliform_Pollution

Spatial Reference
Name: GCS WGS 1984
GCS: GCS WGS 1984
Datum: WGS 1984
Map Units: Degree

N W E S

0 2.5 5 10 Km

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Results of Samples Total Coliform pollution_Oct 2024

Data Collection Date: Up to First of October 2024

Newcastle University

Legend

- DH&KH
- Total_Caliform_not_Pollut
- Total_Caliform_Pollution

Spatial Reference
Name: GCS WGS 1984
GCS: GCS WGS 1984
Datum: WGS 1984
Map Units: Degree

N
W E
S

0 2.5 5 10 Km