Photograph: Majdi Fathi/NurPhoto/Corbis

Gaza: Debris Planning

Overview

Gaza Debris Planning and Management

1. Debris links to humanitarian and recovery
2. Damage assessment and debris quantifications
3. Debris Management Scenarios
4. Resourcing and Sequencing
5. Key Issues:
    a. Spatial Strategy – debris sites
    b. EOD
    c. Trucking
    d. Debris Recycling
    e. Legal procedures

Photograph: Haitham Imad/EPA

Debris Links to Humanitarian & Recovery

- ✓ Provides **safe** access for returning home and shop owners
- ✓ Provides livelihoods and CfW opportunities
- ✓ Recycling the debris can reduce overall rehabilitation and reconstruction costs
- ✓ Removes risks to public, i.e. from unstable structures and presence of hazardous materials (asbestos)
- ✓ Demonstrates "things are starting to happen" and removes scars

Debris removal of commercial area in Homs (Syria) enabling returning shop-owners to safely rehabilitate and open again

Preliminary Damage Assessment & Debris Quantifications

Working assumptions for preliminary quantification:

1. Damage to buildings in Gaza based on UNOSAT Comprehensive Damage Assessment (Nov 26th 2023), building footprint data provided by Microsoft BING with an above surface height model derived from a Digital Terrain Model (SRTM) and a Digital Surface Model (ALOS World 3D)

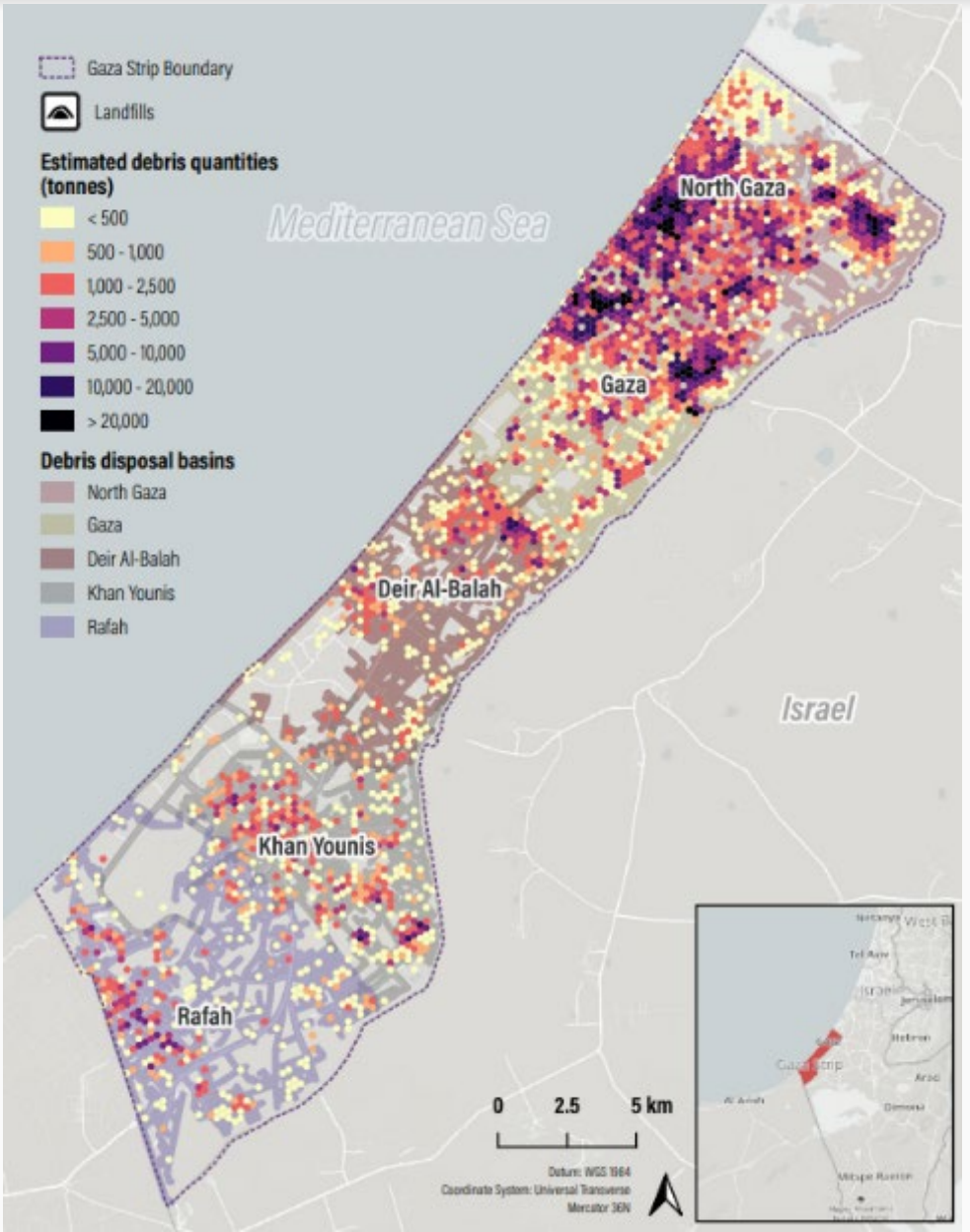
2. Assumed 1 tonne of debris generated from 1m^2 of living space (UNEP experience)

As of end January 2024 expect :

15 million tonnes (TBC)

Region	Debris [t]
North Gaza	2,509,732
Gaza	3,493,123
Deir Al-Balah	414,810
Khan Younis	534,826
Rafah	267,360
Total	7,219,851

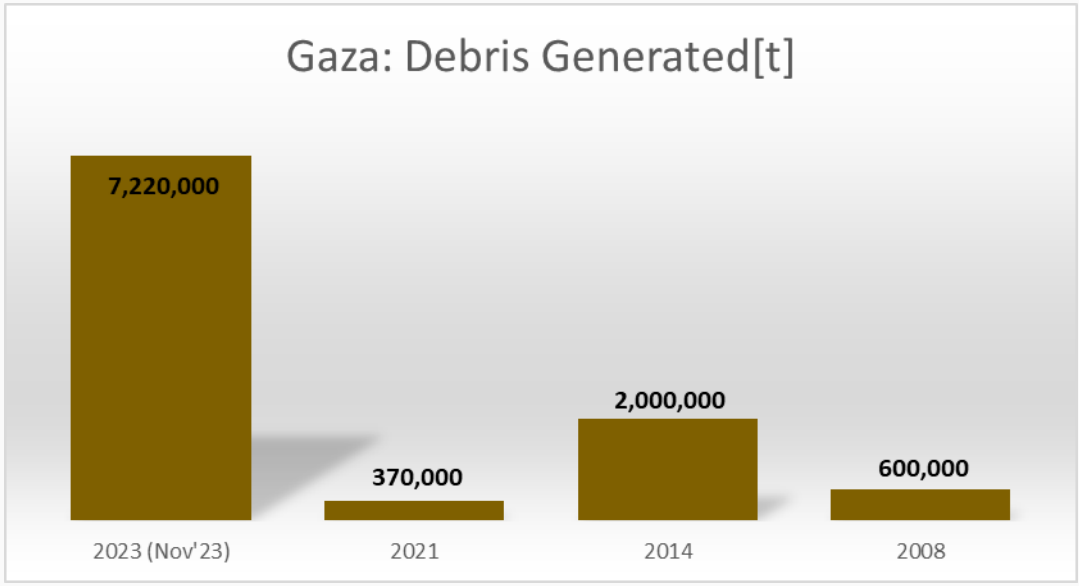
Debris estimations for Gaza regions based on UNOSAT damage assessment of 26th November 2023



Damage Assessment & Debris Quantifications

Analysis:

1. Quantity of debris in Gaza as of 26th November 2024 is **unprecedented** compared to past conflicts in Gaza
2. This excludes debris from infrastructure such as roads which will **increase total amounts**
3. The density of urban damage and debris will be a key challenge for logistics and spatial strategies
4. It is expected debris quantities in Gaza will ultimately **match or exceed other major international conflicts**



Ukraine
>18M tonnes as of 2023
Kyiv School of Economics

Aleppo (Syria)
>14M tonnes
World Bank

Mosul (Iraq)
>10M tonnes
UNEP

Debris Management Scenarios

Adopted following scenarios:

	Debris for disposal	Debris Recycled
Scenario 1	100%	0%
Scenario 2	50%	50%

*As of end January 2024 expect to **double** these values*

Results

	Scenario 1	Scenario 2
Time to clear debris and recycle *(with 105 trucks)*	33 months	150 months *Includes recycling the debris*
Cost to clear less recycled debris revenue *(sale of recycled debris into reconstruction)*	US$ 91 million	US$ 60 million
Recycled debris for reconstruction use	0 tonnes	3,600,000 tonnes
Value of recycled debris	US$ 0	US$ 54 million
Debris disposed of	7,220,000 tonnes	3,600,000 tonnes
Land required for debris disposal	90 hectares	45 hectares

Debris Management Resource Requirements

Implications based on 15 million tonnes debris and ca. 60,000 damaged buildings/households (UNOSAT):

If a 3 year debris clearance programme then…..

55 buildings per day to be:

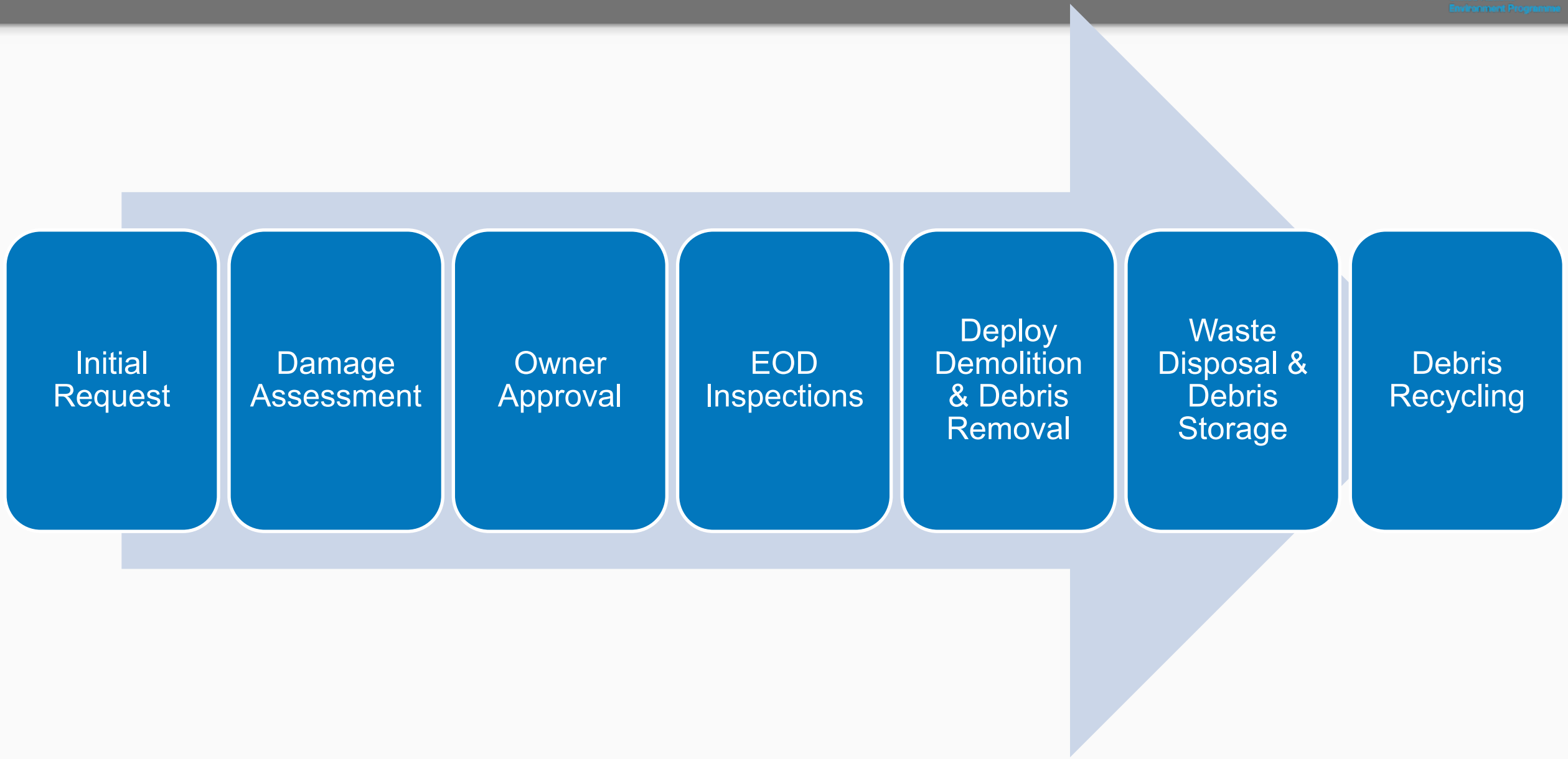
- Damage assessed and approved (several being multi-ownership)
- Released by Mine Action for safe works

If a 5 year debris clearance programme then….

33 buildings per day to be:

- Damage assessed and approved (several being multi-ownership)
- Released by Mine Action for safe works

Debris Management Sequence



Debris: Planning Actions

To meet debris removal objectives following planning actions required:

1. Establish a Debris Management Working Group
2. Facilitate import of fuel, plant and heavy machinery
3. Disseminate debris safety awareness to the public
4. Agree on legal procedures for demolition & debris removal approvals
5. Prepare sequence of activities with mine action/UXO to ensure sites are safe to work
6. Determine location of debris disposal and recycling sites
7. Determine end use applications for the recycled debris materials incl. technical specifications
8. Agree on asbestos protocol aligned with authority and Donor expectations
9. Coordinate debris removal target locations (sequence) with humanitarian & recovery activities
10. Develop standardised debris management reporting templates
11. Develop standard training modules and programs (online)
12. Prepare debris scenarios & resource requirements based on outcomes of planning actions
13. Develop proposals for CfW Demonstration Projects on debris removal with recycling for funding
14. Procurement of required plant and machinery in readiness for implementation

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