



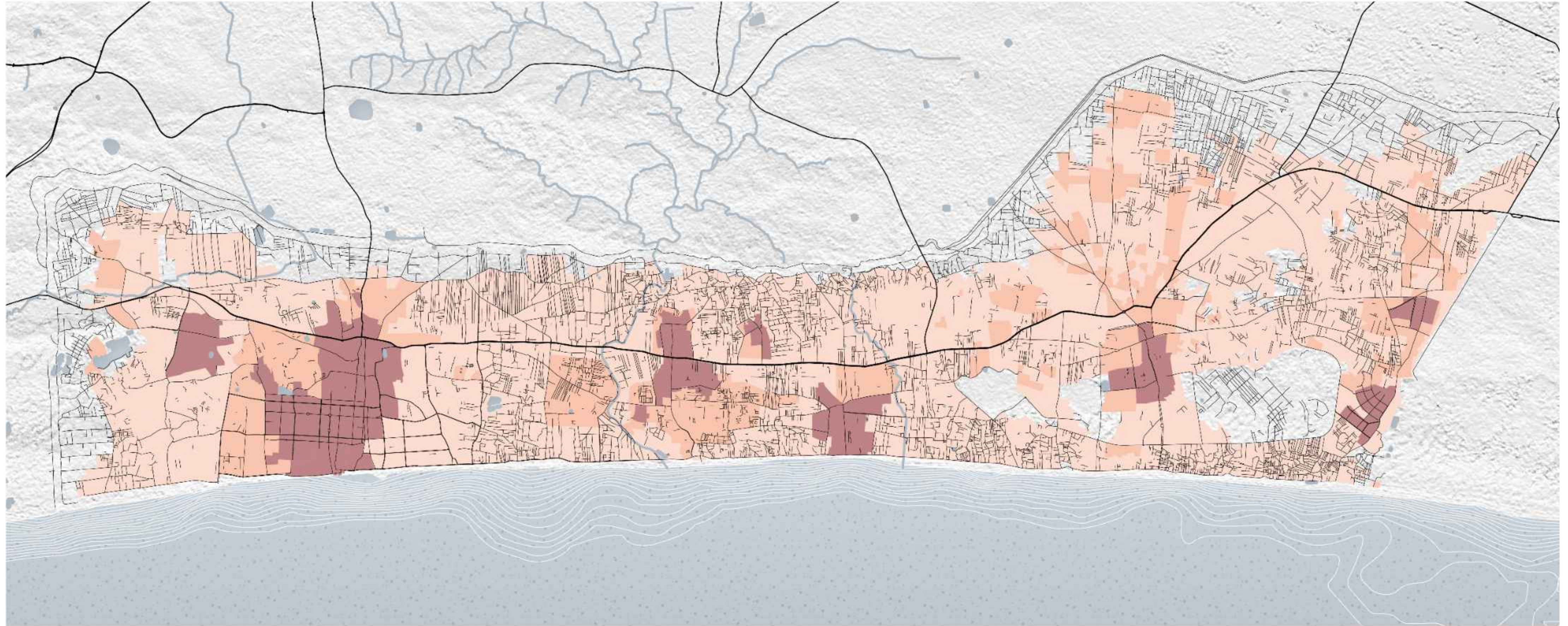
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Università Iuav
di Venezia

UNDP SUPPORT TO GAZA EARLY RECOVERY, RECONSTRUCTION AND RESILIENCE

UNDP Programme of Assistance to the Palestinian People - Università Iuav di Venezia

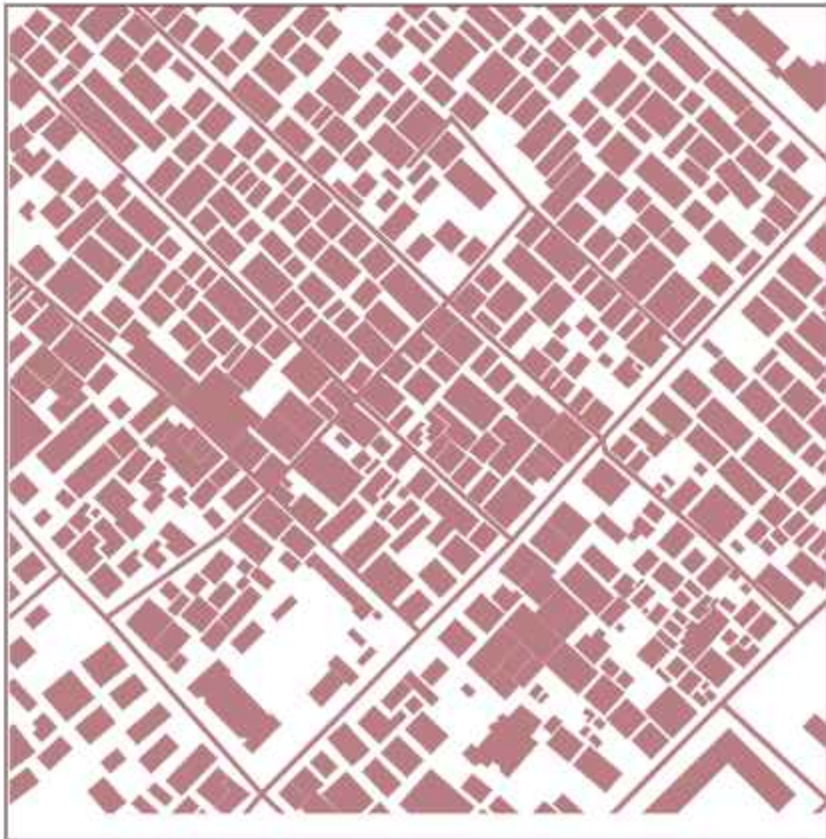
GAZA YESTERDAY



- Compact and dense
- Sparse and Cores
- Sparse

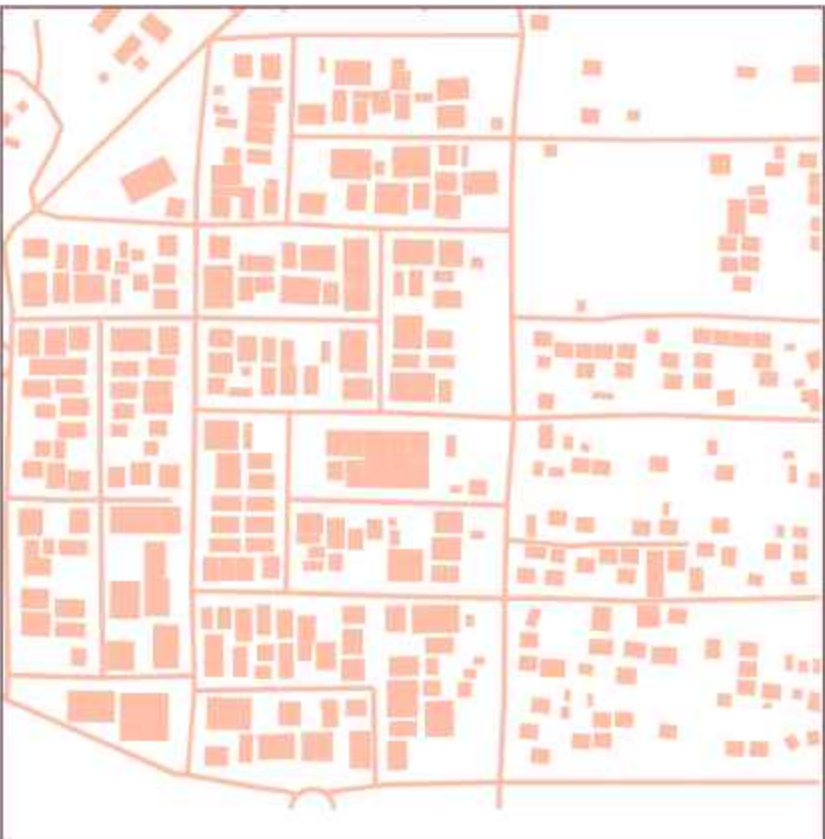
URBAN PATTERNS YESTERDAY

Pop: 2,300,000
Sqm/pers: 149.06



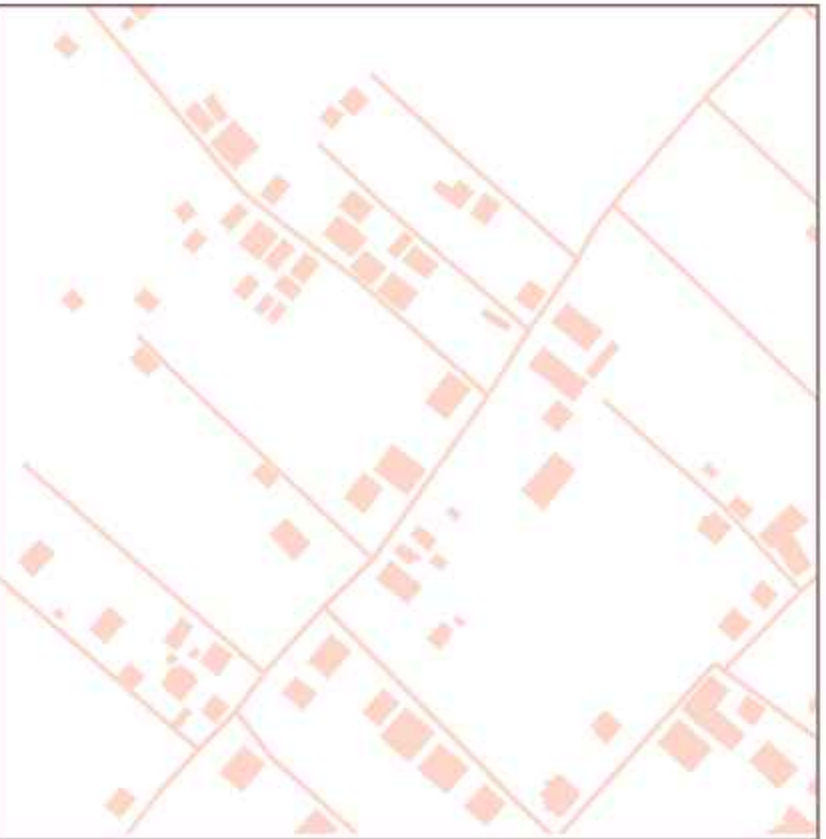
8%

Urban Pattern:
COMPACT AND DENSE
FSI: 2
built urban pattern: 55.94 sqkm



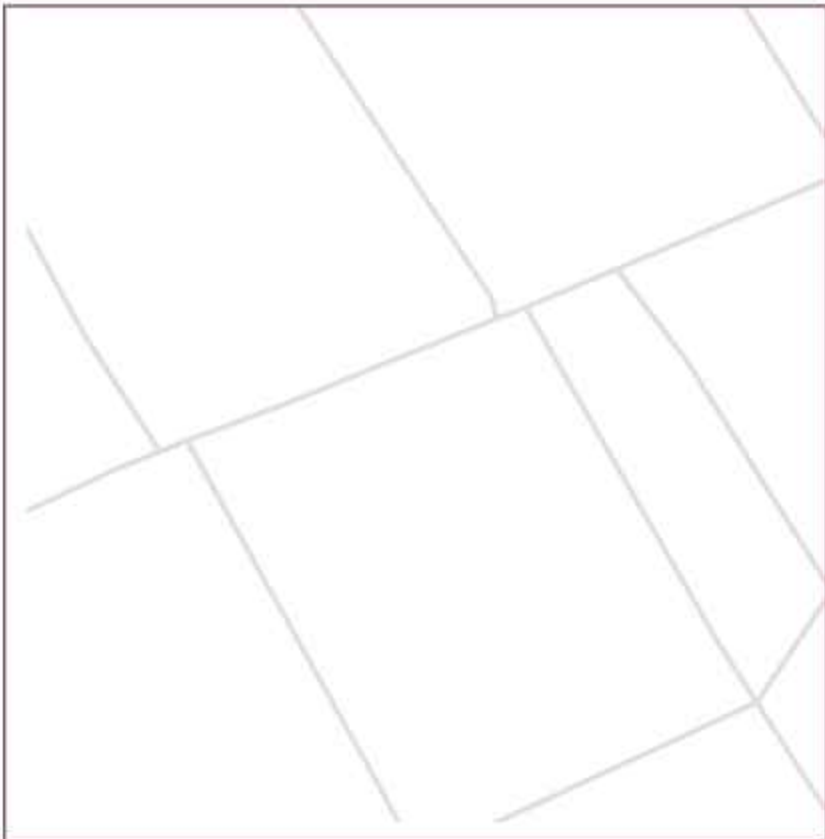
13%

Urban Pattern:
SPARSE AND CORE
FSI: 1.5
built urban pattern: 70.99 sqkm



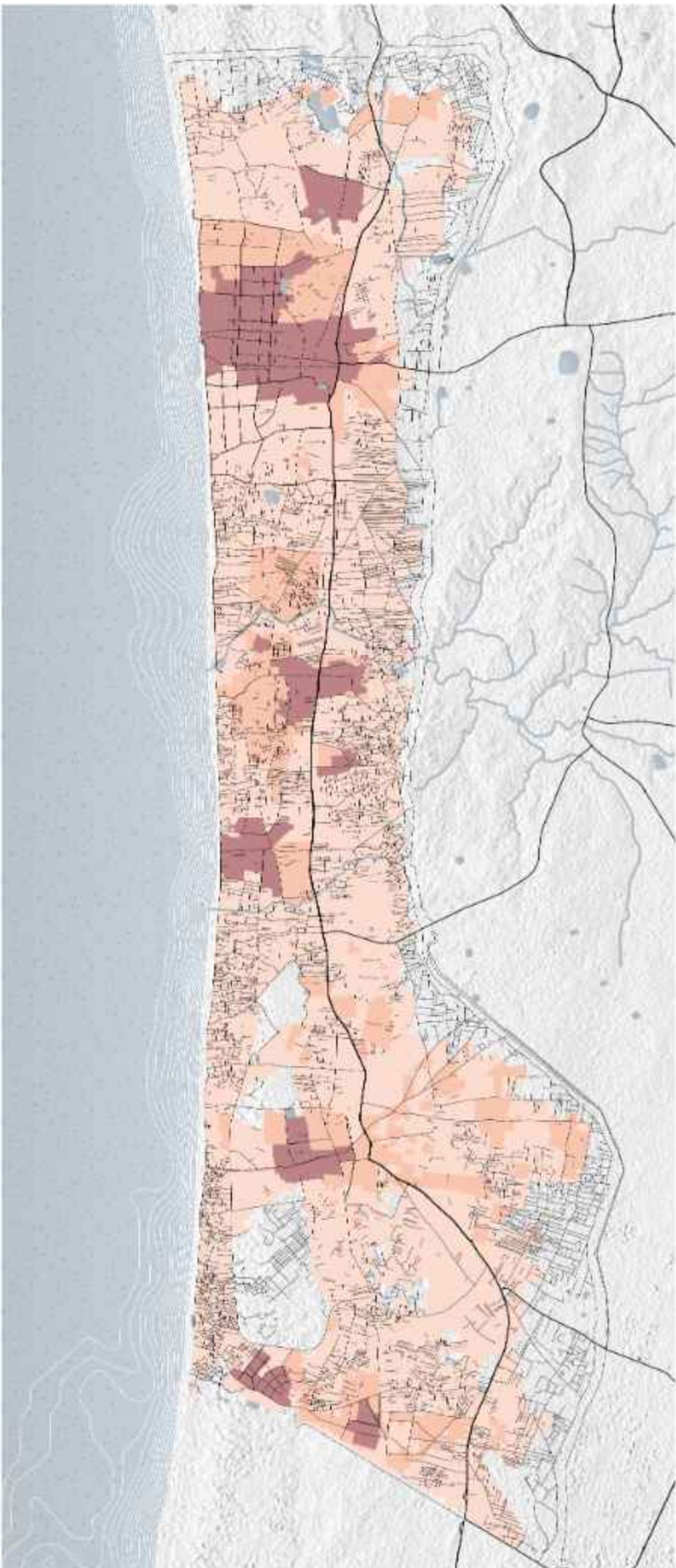
54%

Urban Pattern: **SPARSE**
FSI: 1.1
built urban pattern: 215.51 sqkm



25%

Urban Pattern:
NOT URBANISED
FSI: 0
built urban pattern: 0 sqkm



GAZA FUTURE



- Urban Cells
- Desalinator
- ▨ Field
- Solar Panel
- Wind Turbine

URBAN PATTERNS FUTURE

Pop: 2,300,000
Sqm/pers: 121.73



38%

Urban Pattern:
COMPACT AND DENSE
FSI: 2
built urban pattern: 28 sqkm



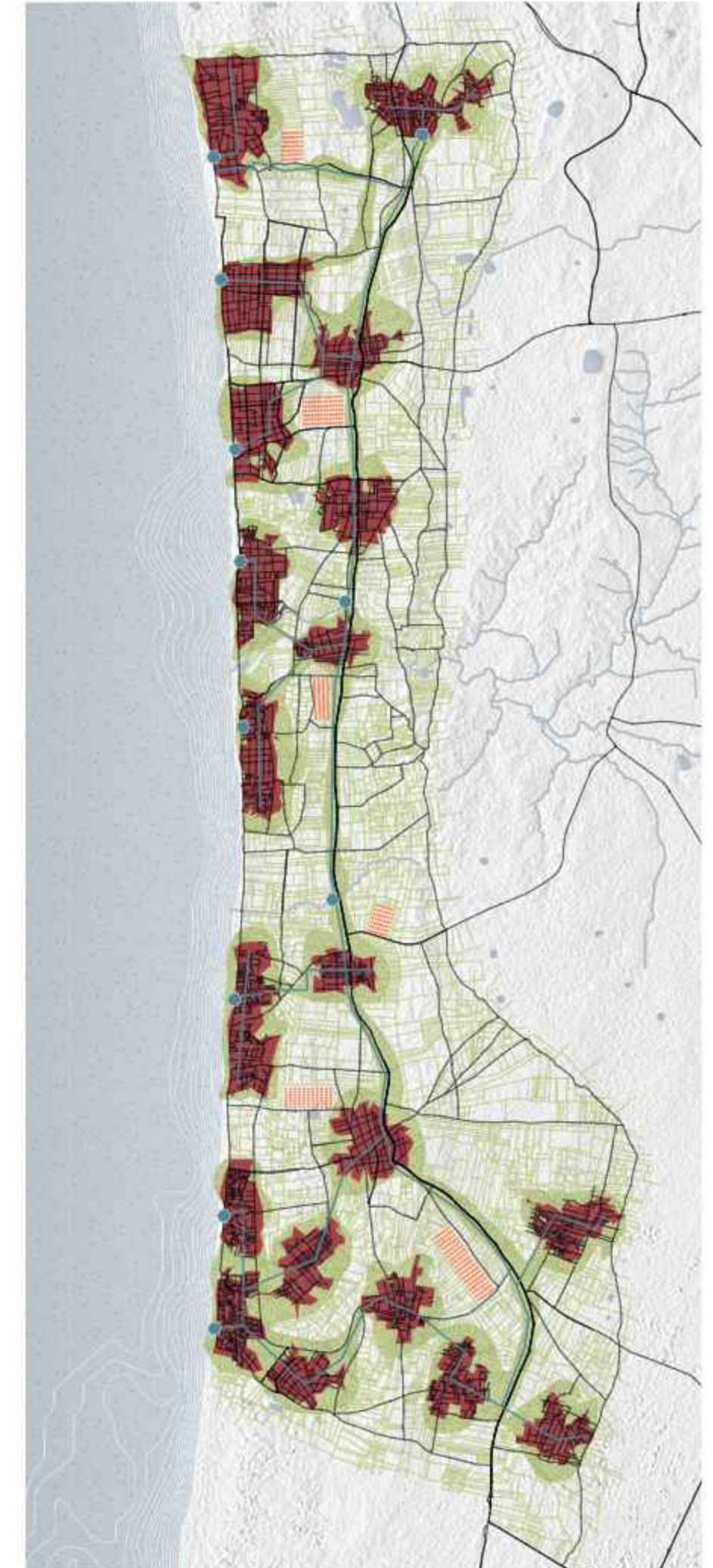
10%

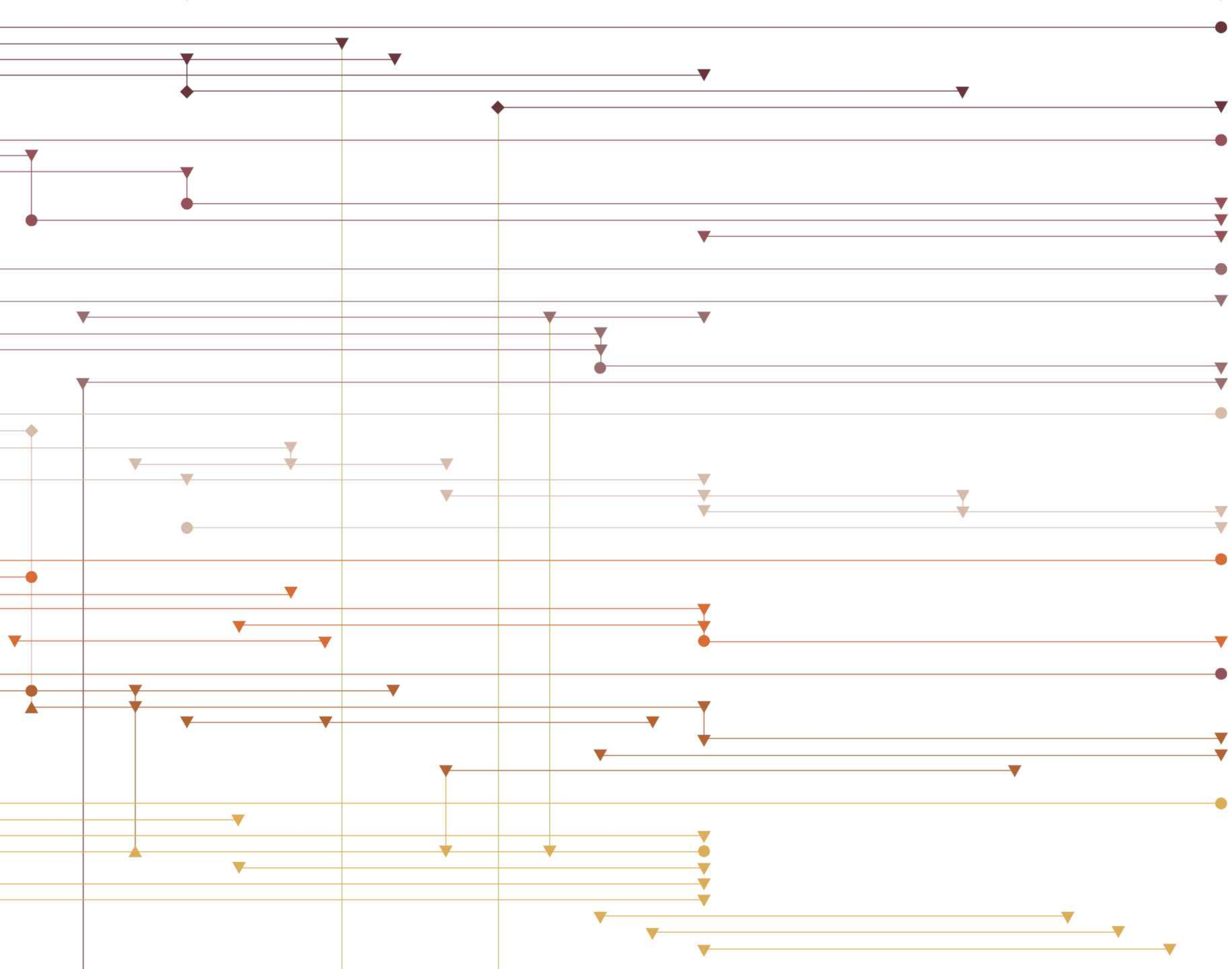
Urban Pattern:
PRODUCTIVE
FSI: 1.1
built urban pattern: 40.15 sqkm



52%

Urban Pattern:
AGRICULTURAL
FSI: 0
built urban pattern: 0 sqkm





DEBRIS

- A.1 Debris removal
- A.2 Sorting of debris, war and demolition waste
- A.3 Debris reuse for new orography
- A.4 Debris reuse as construction materials
- A.5 Establish debris reuse and recycling enterprises

ENERGY

- B.1 Offshore power plant ships
- B.2 Installation of solar panel on porticoes
- B.3 Installation of Stirling engine for productive plants
- B.4 Energy storage systems for photovoltaic panels
- B.5 Construction of power generation and storage
- B.6 Differentiation of energy sources

WATER/SANITATION

- C.1 Floating desalination vessels
- C.2 Land-based micro desalination plant
- C.3 Optimisation of domestic water storage
- C.4 Restoration of the sewage disposal network
- C.5 Restoration of water supply network
- C.6 Optimisation of water and sewage networks
- C.7 Implementation of systems for agricultural water use

INFRASTRUCTURES

- D.1 Building of a portico in free areas or cleared areas
- D.2 Building of landings for mooring ships
- D.3 Building of an infrastructural wall for basic networks
- D.4 Recovery of hard infrastructures
- D.5 Construction of new connecting roads
- D.6 Fostering a new mobility
- D.7 Pedestrianization of a large part of urban cells

PUBLIC SERVICES

- E.1 Placement of basic services on dedicated ships
- E.2 Moving of basic services in proximity to newly built porticoes
- E.3 Re-establish basic public services
- E.4 Planning and new construction of destroyed services
- E.5 Construction of leisure facilities, university, tourism

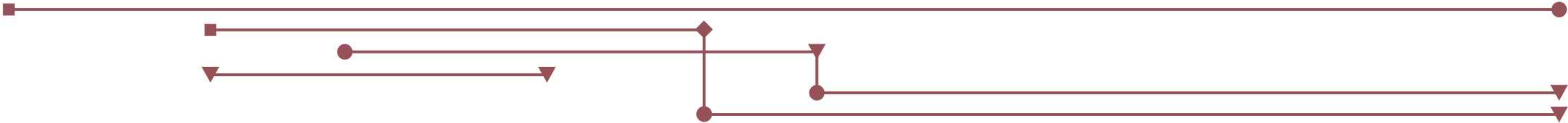
FACTORY

- F.1 Pultrusion lines installed on boats
- F.2 Moving of pultrusion factories in proximity to areas in need of rebuilding
- F.3 Establishment of factories for the reuse of debris
- F.4 Pultrusion factories are available for sales on the global market
- F.5 Establishment of factories for the transformation of agricultural products
- F.6 Definition of productive spaces linked to the mini cities

HOUSING

- G.1 Building of temporary/transitional shelter under the porticoes
- G.2 Planning for parcel distribution around the portico
- G.3 Building of housing starting from the portico
- G.4 Construction of new porticoes with public function and lotting
- G.5 Recovery of slightly damaged housing to enable return of IDP's
- G.6 Recovery of medium and severely damaged housing
- G.7 Densification through high rise growth on the edges
- G.8 New construction on areas previously occupied by debris
- G.9 Transformation of areas occupied by debris in empty public spaces

DESIGN FLOW FUNCTIONING



FIXED POINT

This item is usually a starting point: it cannot be shifted in time and needs no previous actions to be activated.



ONE-DIRECTION

This item can be eventually delayed in time, with no direct impact on cascade of actions.



BI-DIRECTIONAL

This item can be advanced or delayed in time. It impacts on the following cascade of actions.



CONSTRAINED

The timing of these actions is a strong constrain to the other actions on the same vertical line: moving them corresponds to move all the connected actions.

STRATEGY

- 01 Design
- 02 Modeling
- 03 Adaptive tools
- 04 Re-Lab
- 05 Monitoring

DEBRIS

- A.1 Debris removal
- A.2 Sorting of debris, war and demolition waste
- A.3 Debris reuse for new orography
- A.4 Debris reuse as construction materials
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- D.1 Building of a portico in free areas or cleared areas
- D.2 Building of landings for mooring ships
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- D.7 Pedestrianization of a large part of urban cells

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COMMUNITY

- H.1 Reconstruction laboratories for collective decision making
- H.2 Safe collective spaces for women and children
- H.3 Setting up of construction testing ground for skills development
- H.4 Setting up of training institution centers
- H.5 Conservation and restoration of cultural heritage

FOOD

- I.1 Removal of rubble and debris from cultivated fields
- I.2 Construction of greenhouses for the maximization of food production
- I.3 Implementation of advanced irrigation techniques for water saving
- I.4 Reuse of agricultural products in building materials

ECONOMY/EMPLOYMENT

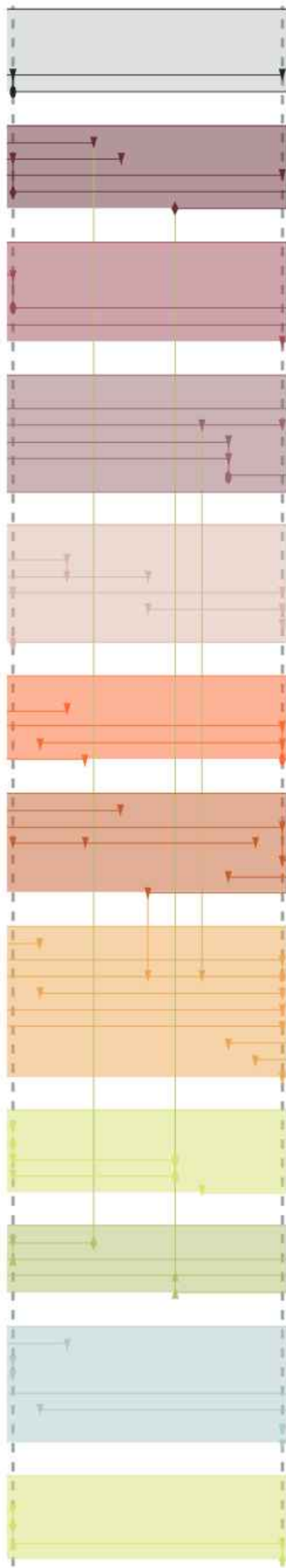
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- J.6 Optimization of a circular and sustainable economy
- J.7 Generation of mid-term and long-term jobs

LAND MANAGEMENT

- K.1 Damage and cadastral assessment
- K.2 Temporary transfer of properties to Public Agency
- K.3 Land acquisition for new cells development
- K.4 Public urbanisation
- K.5 Private development and bond redemption



EARLY RECOVERY CITY



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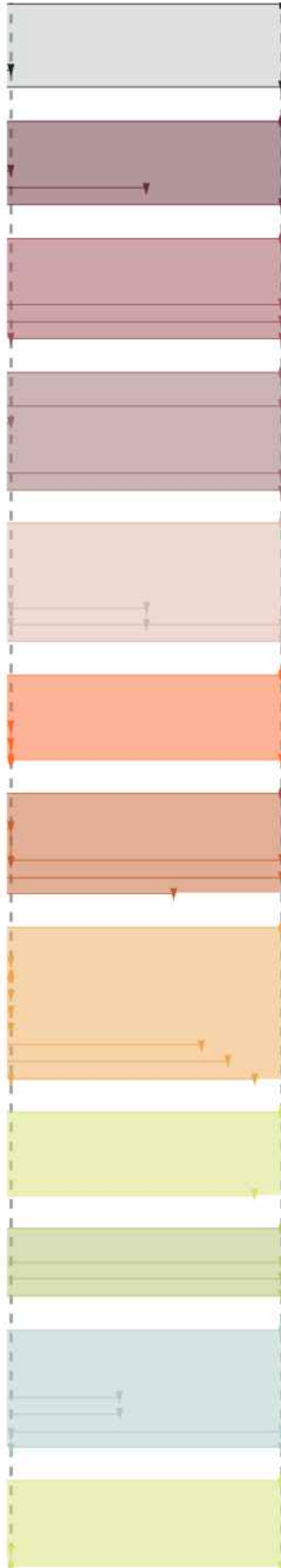
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EARLY RECOVERY / TRANSITIONAL HOUSING

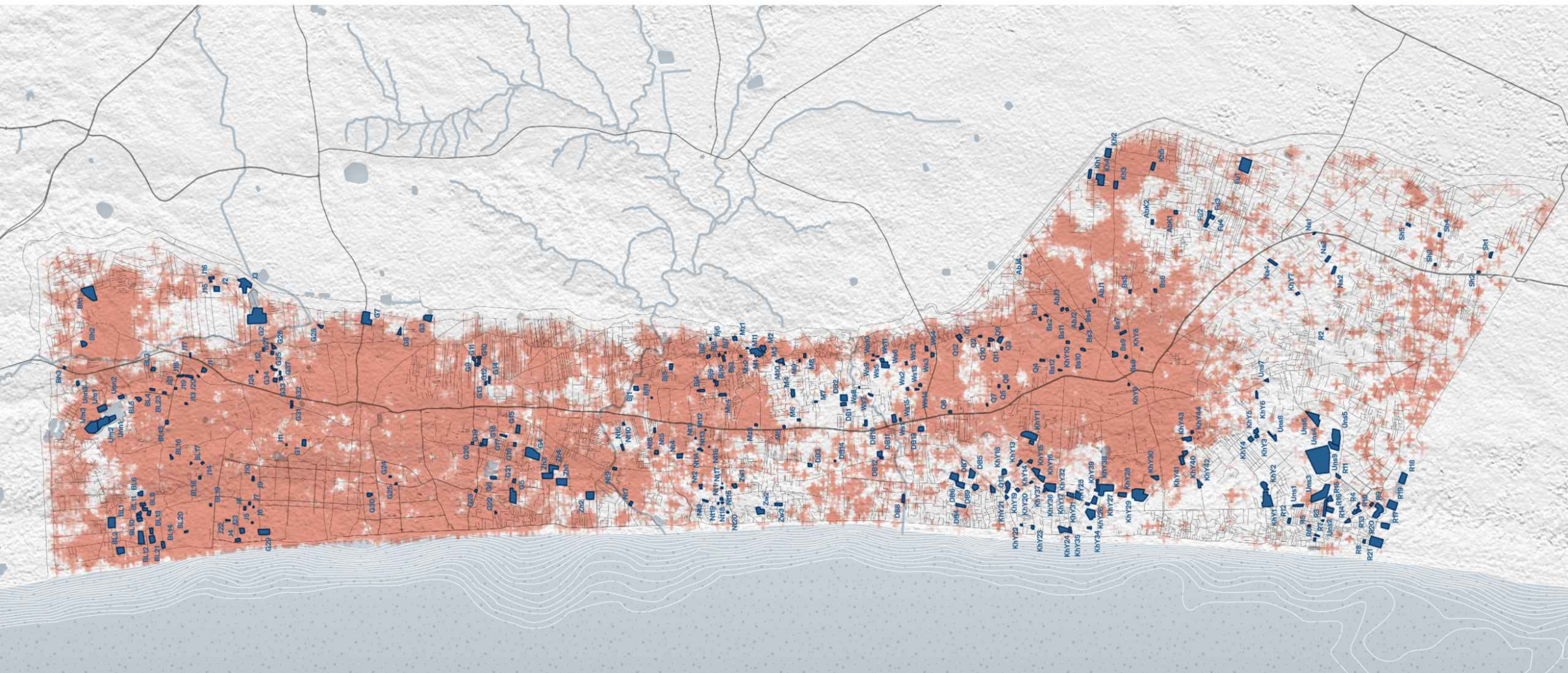
UNDP SUPPORT TO GAZA EARLY RECOVERY,
RECONSTRUCTION AND RESILIENCE

DAMAGE ASSESSMENT AND SITES IDENTIFICATION

SOURCE: UN HABITAT / UNOSAT

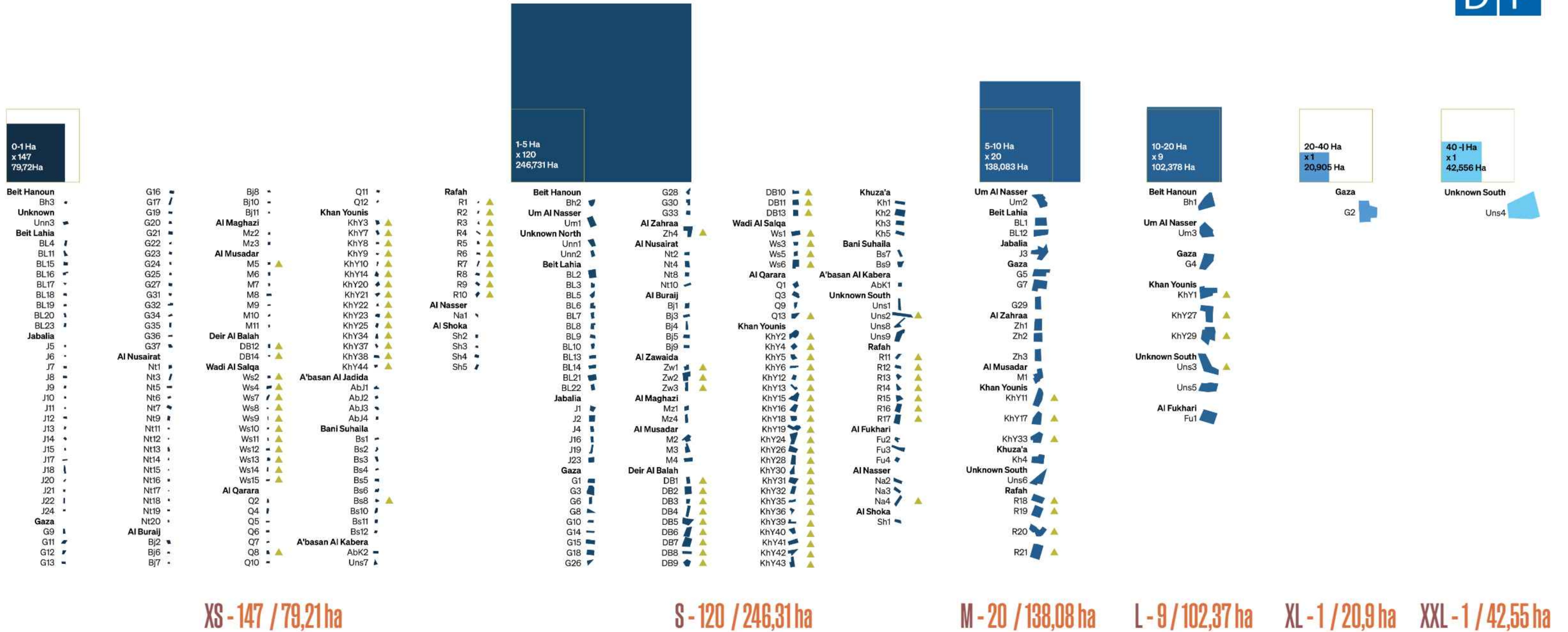


Total Areas. 298 / Total Surface 630,37 Ha



CLASSIFICATION OF TOTAL SITES

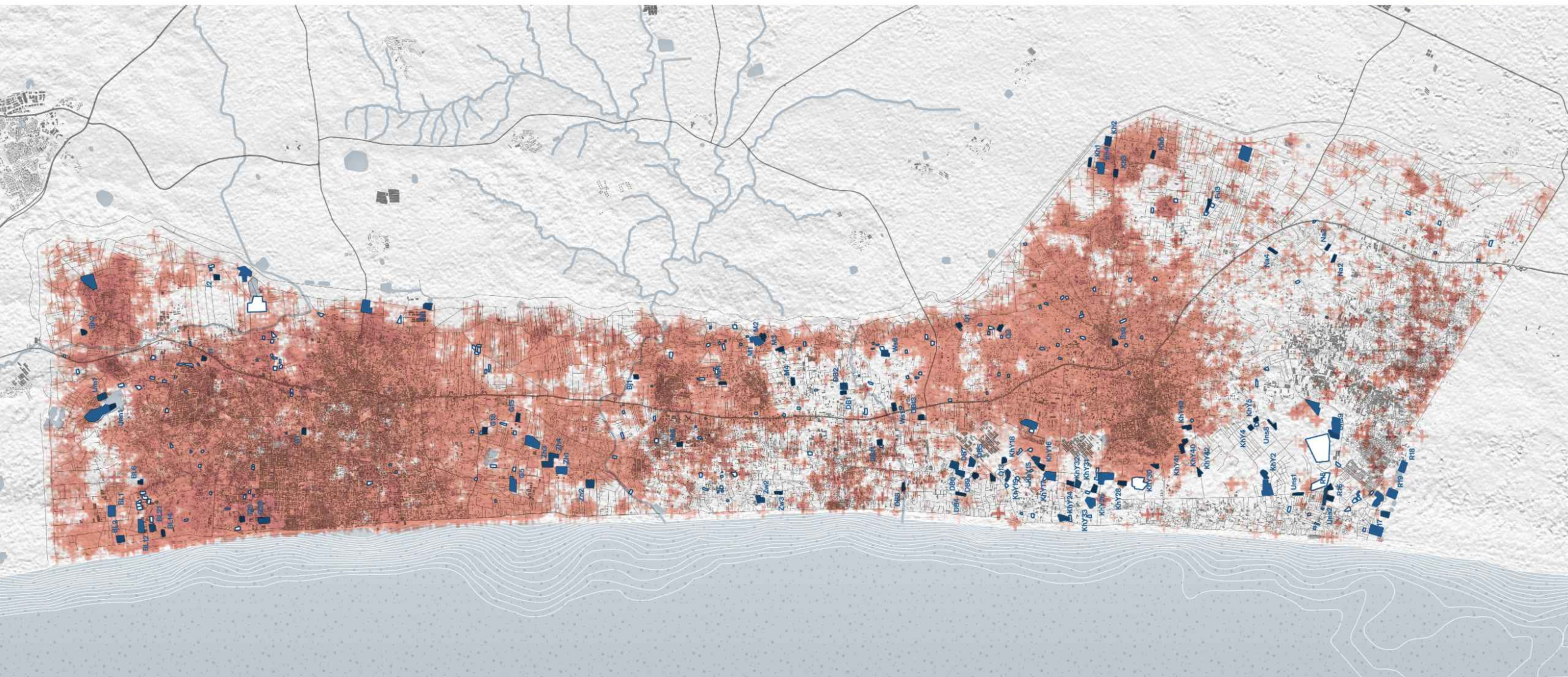
SOURCE: UN HABITAT / PROTECTION CLUSTER OPT



SITES IDENTIFICATION CLASS A-B-C

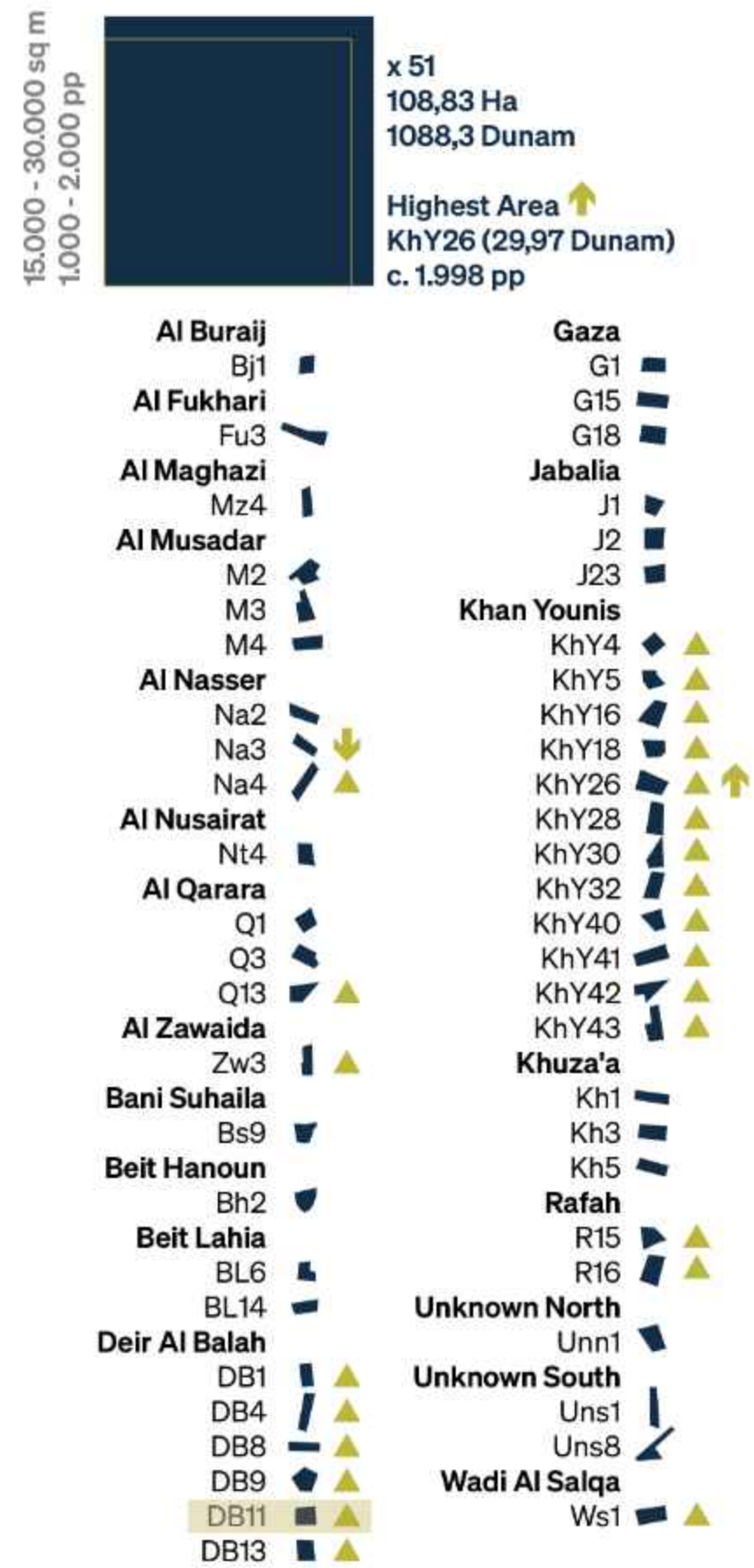
SOURCE: UN HABITAT / UNOSAT

Total Areas. 98 / Total Surface 397,94 Ha

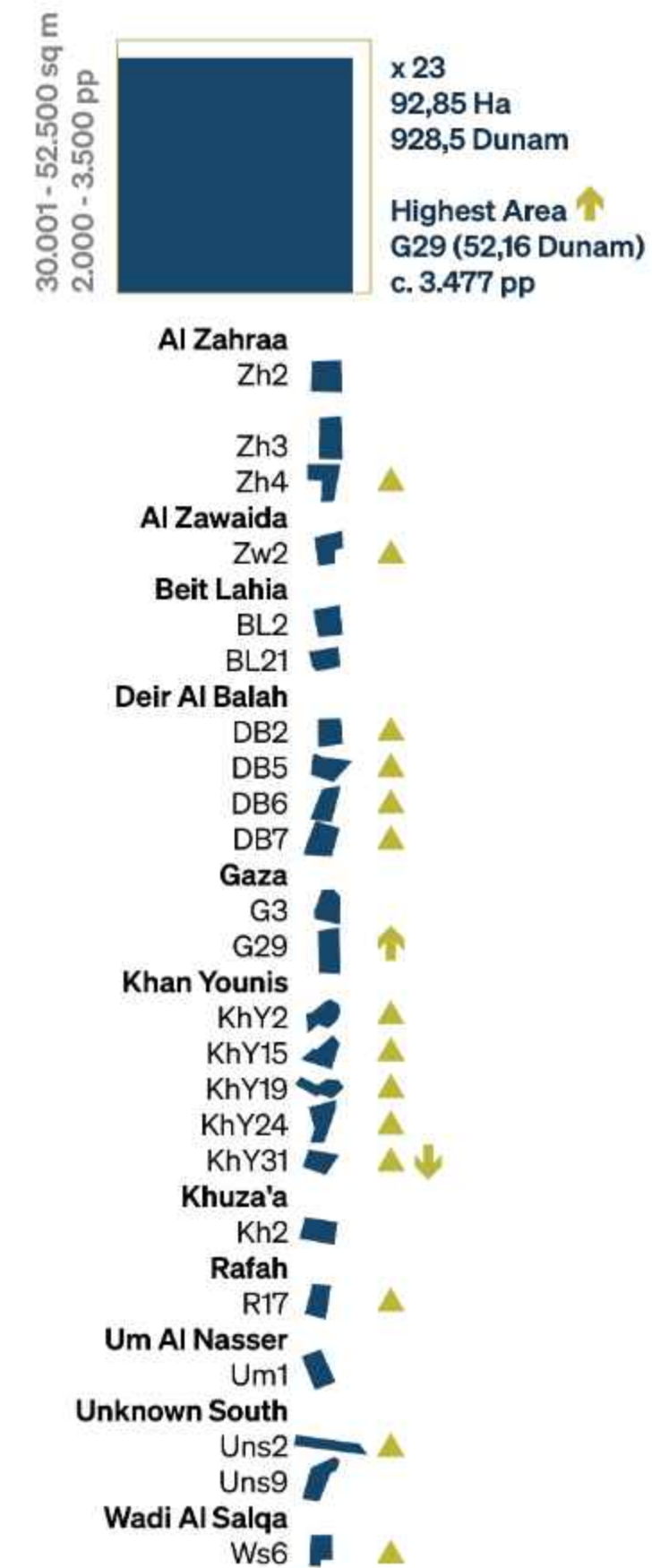


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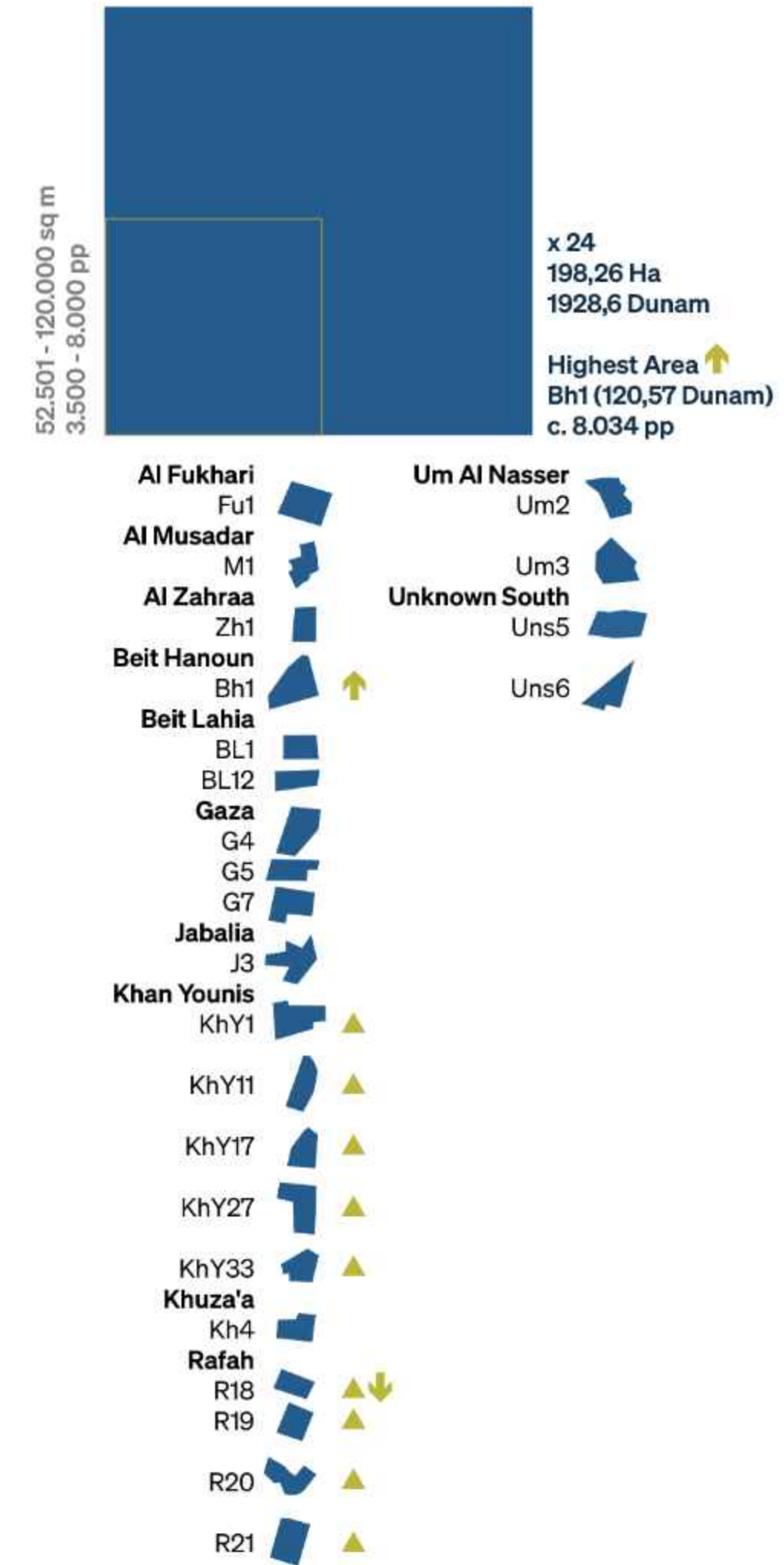
SOURCE: UN HABITAT / PROTECTION CLUSTER OPT



CLASS A - 51 / 108,83 ha

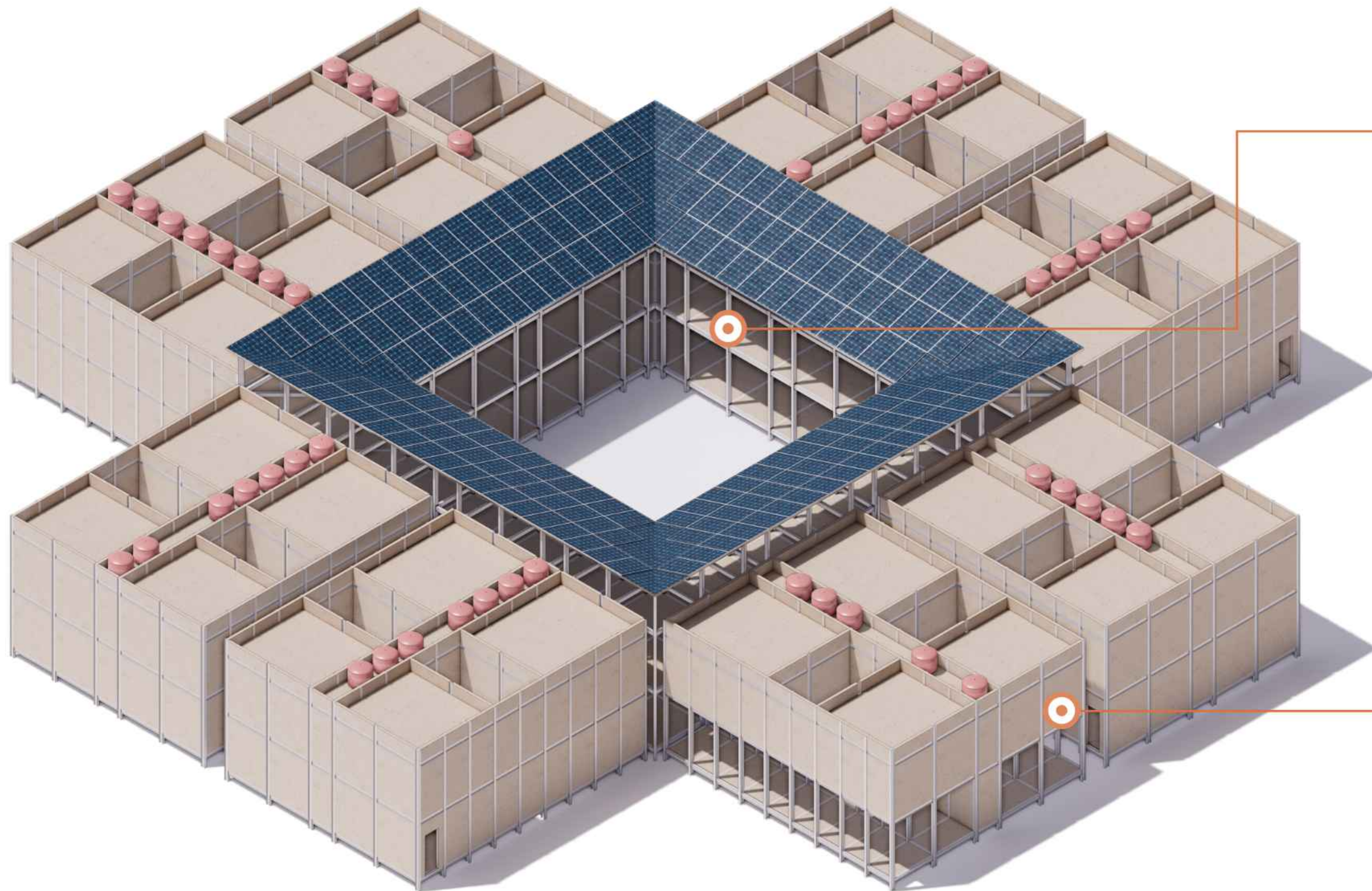


CLASS B - 23 / 92,85 ha



CLASS C - 24 / 198,6 ha

HOUSING MODULES



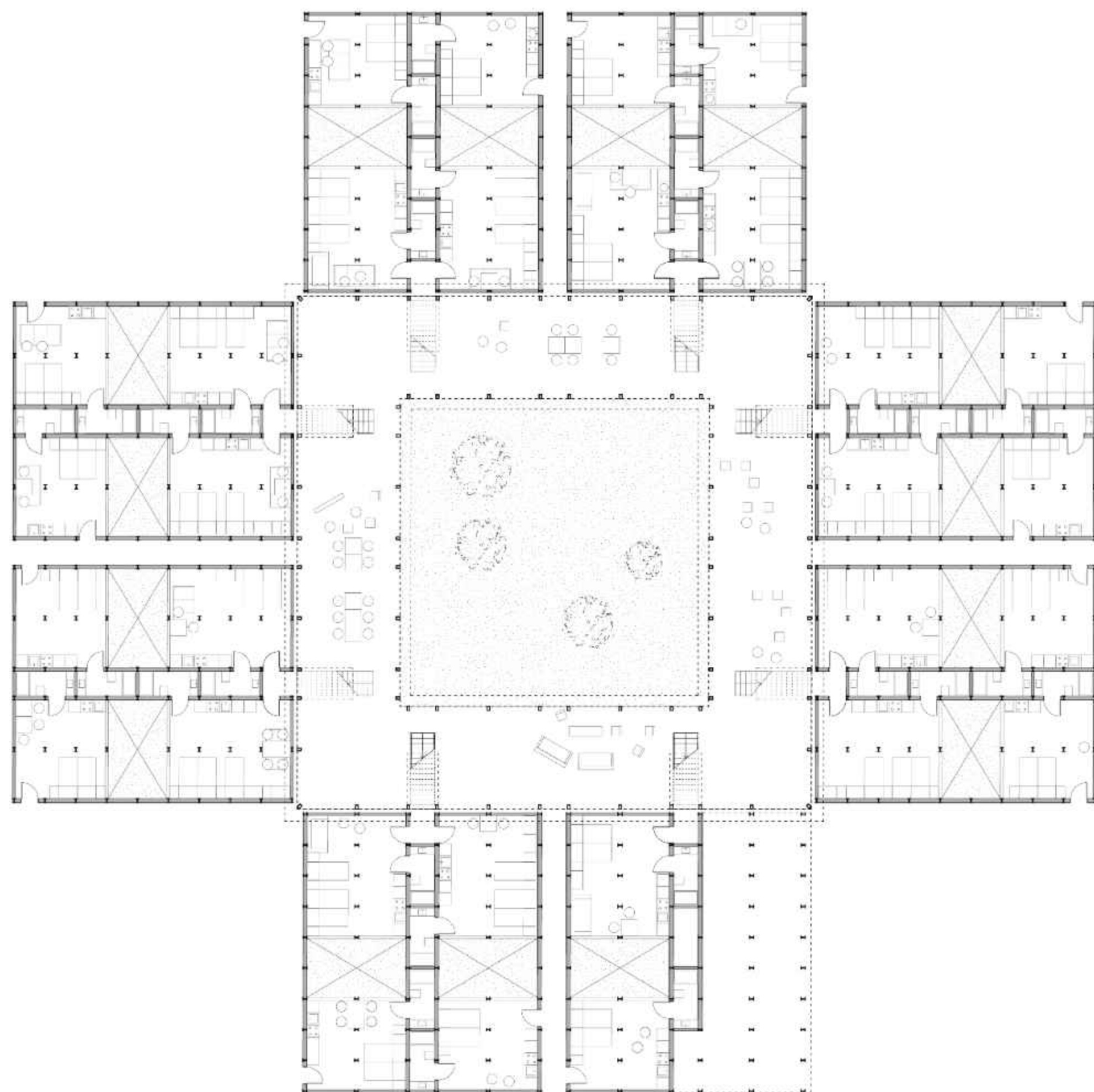
● PULTRUSE STRUCTURES

Light fiberglass components with equal section. Fiberglass production is completely waterless

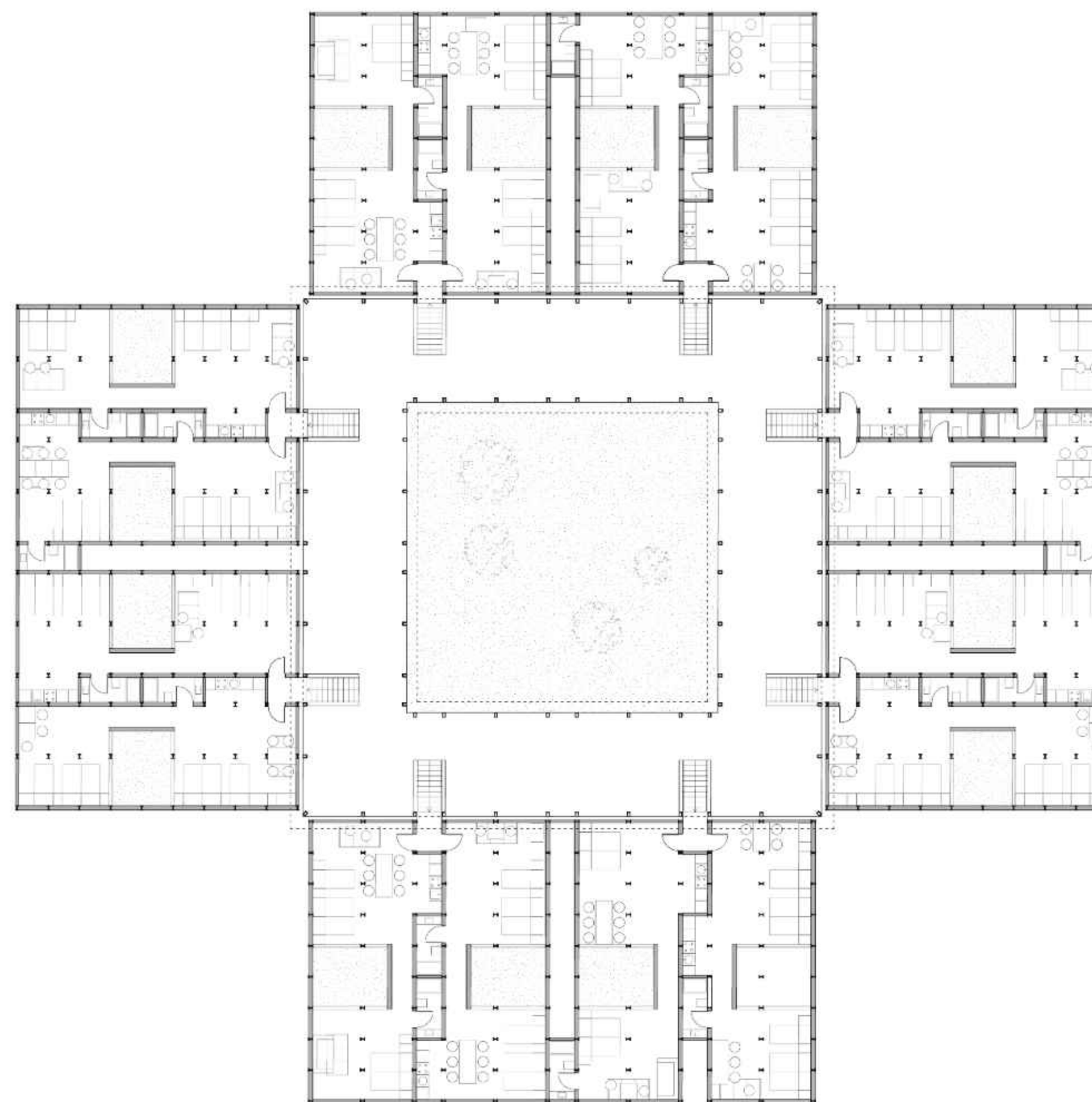
● RUBBLE RECOVERY

Fillings can be produced with panels or bricks built from rubbles with cement or glue aggregates.

HOUSING MODULES - PLANS

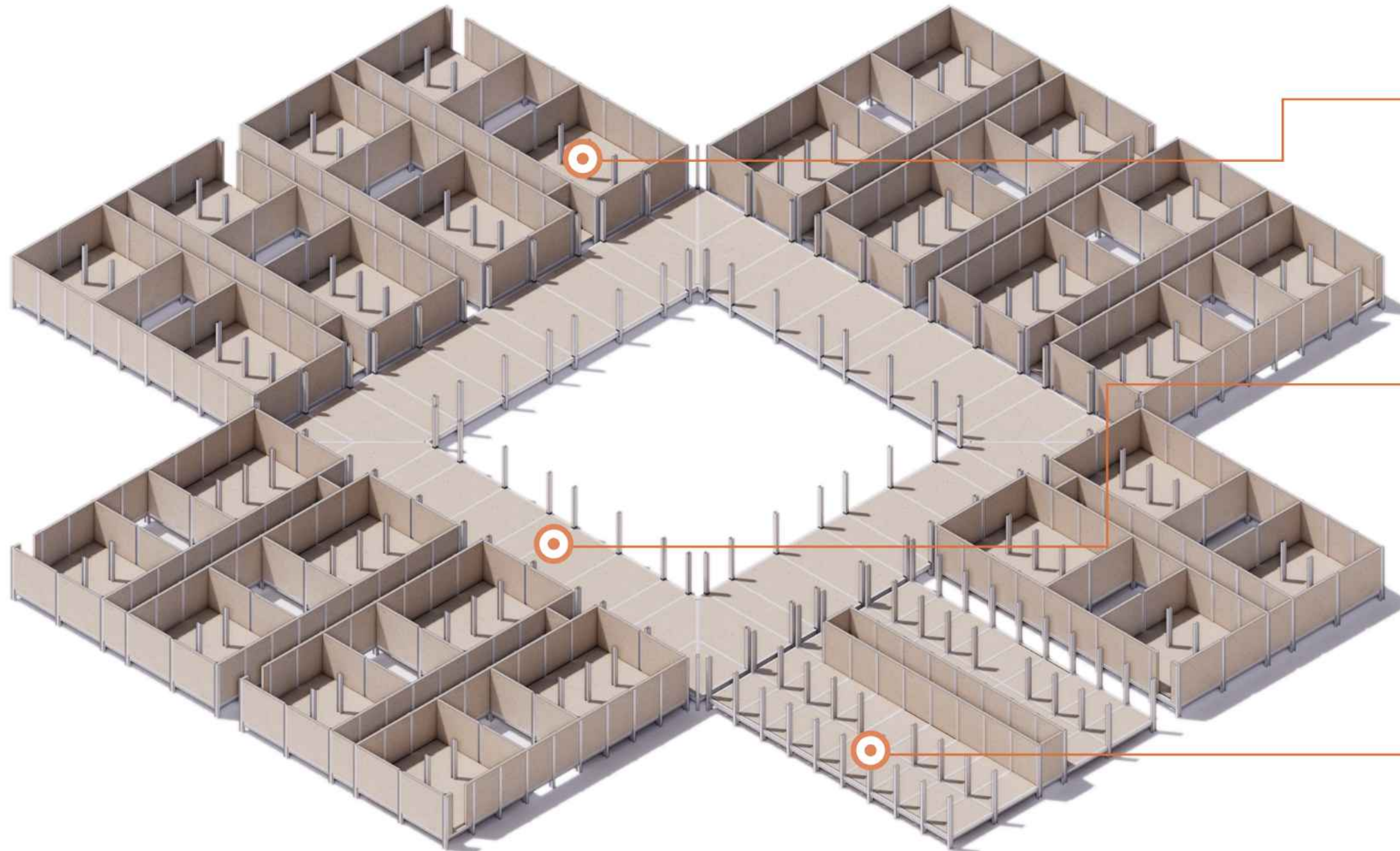


GROUND FLOOR - 30 UNITS 15 UNT. 20SM / 15 UNT. 30SM



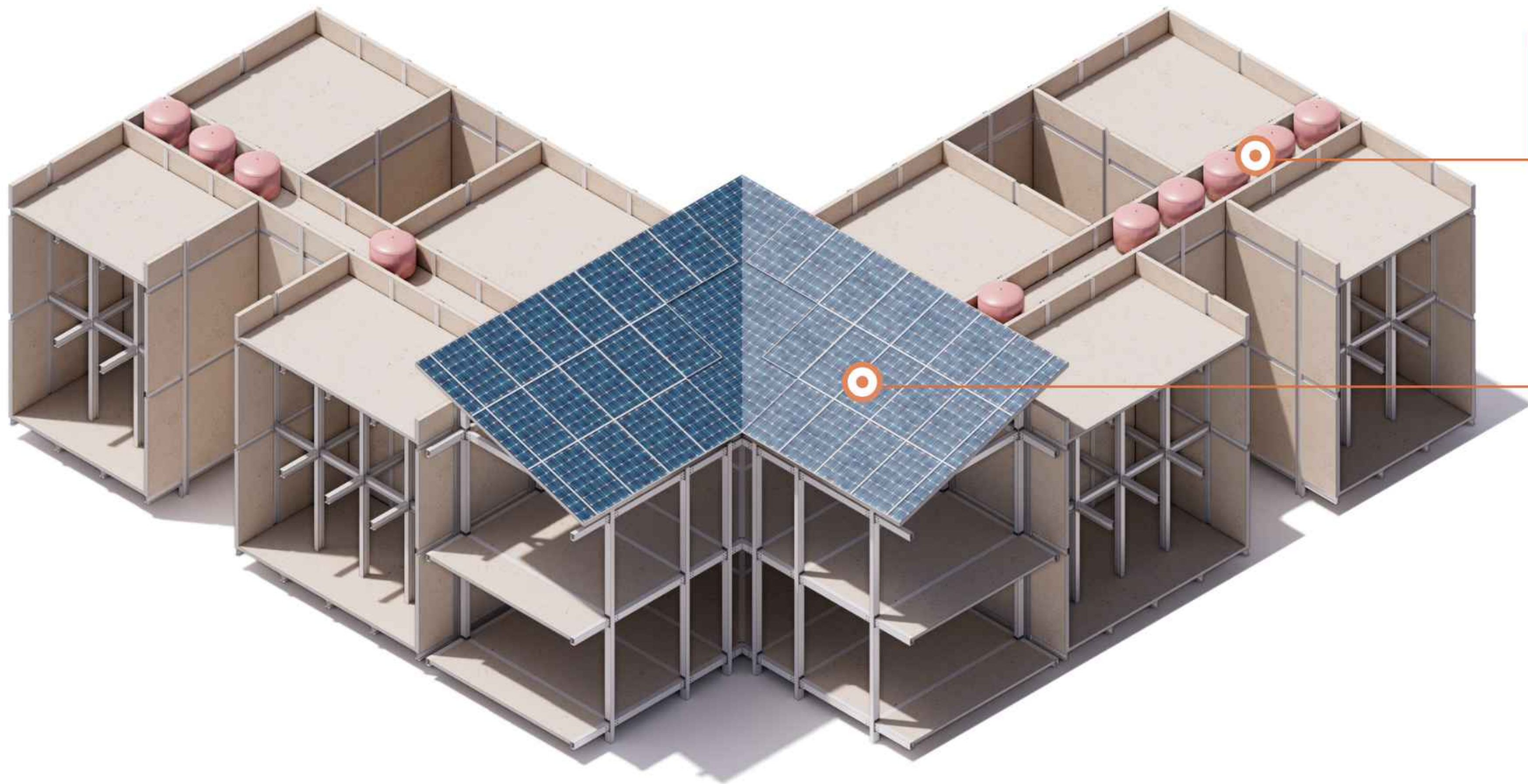
FIRST FLOOR - 16 UNITS 60 SM

HOUSING MODULES - STRUCTURE



- LIVING UNITS**
Each module provides 46 living units with private sanitation facilities and different sizes (20, 30, 60 sqm).
- PUBLIC SPACE**
Each module provides a central portico as a private space that can be adapted to different uses (commercial, educational, etc.)
- EMPLOYMENT OPPORTUNITIES**
The construction of modules can provide local communities with new skills and generate a spark in local economy.

HOUSING MODULES - STRUCTURE



WATER

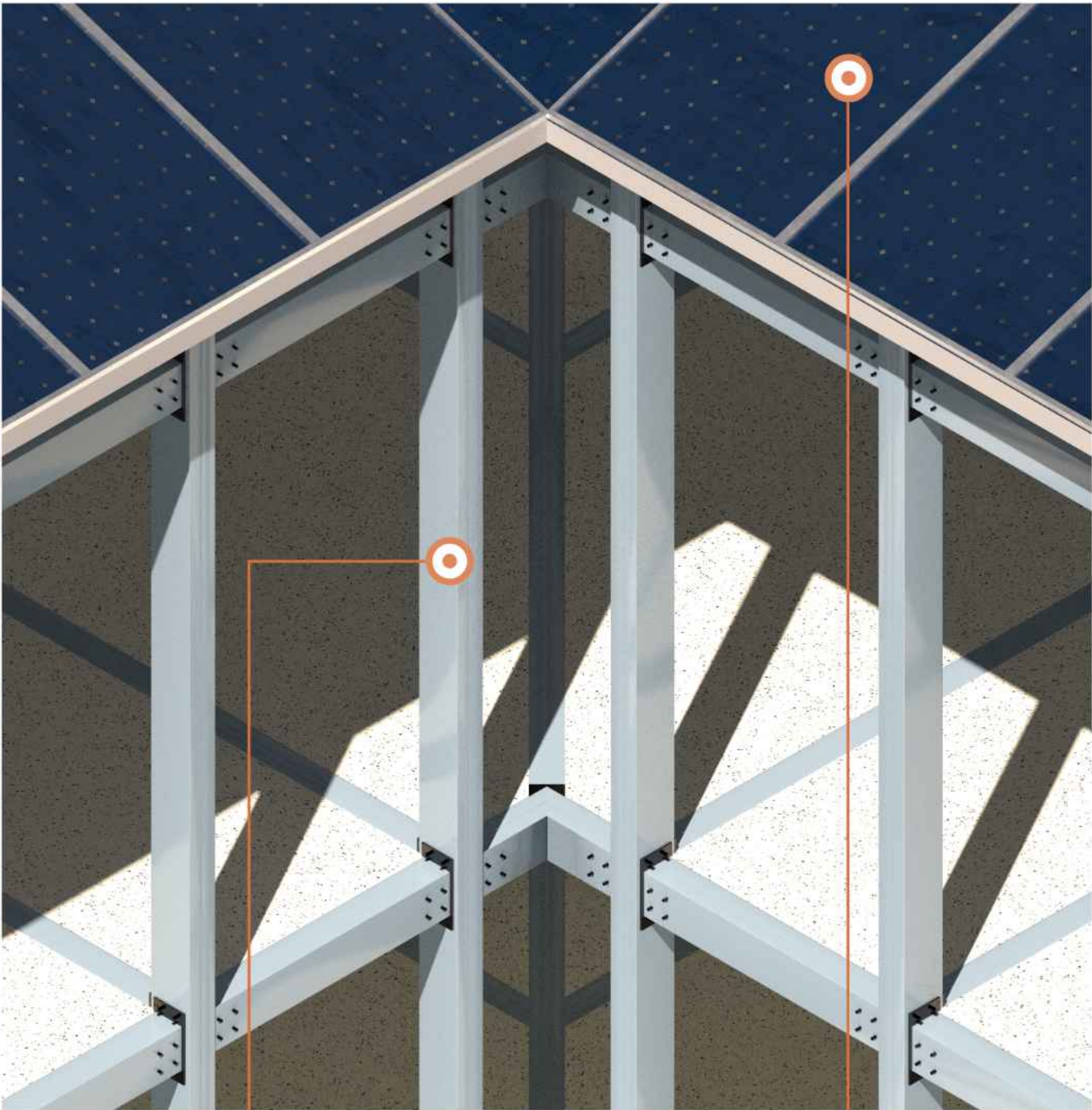
Sanitation facilities are integrated in the living modules that are to be equipped with water tanks.



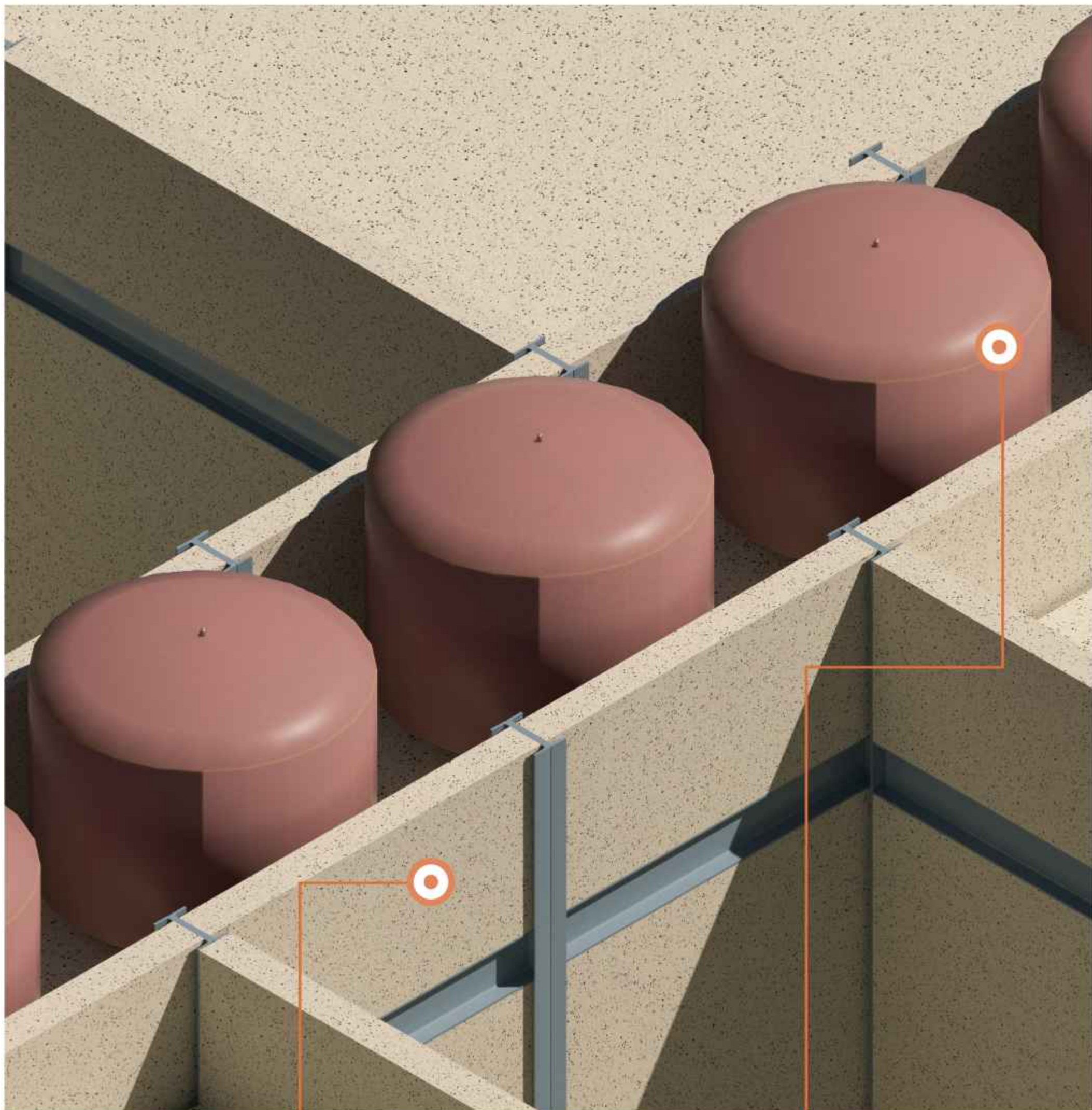
ENERGY

The portico is equipped with solar and photovoltaic panels to guarantee a sufficient amount of energy to the modules.

HOUSING MODULES - DETAILS

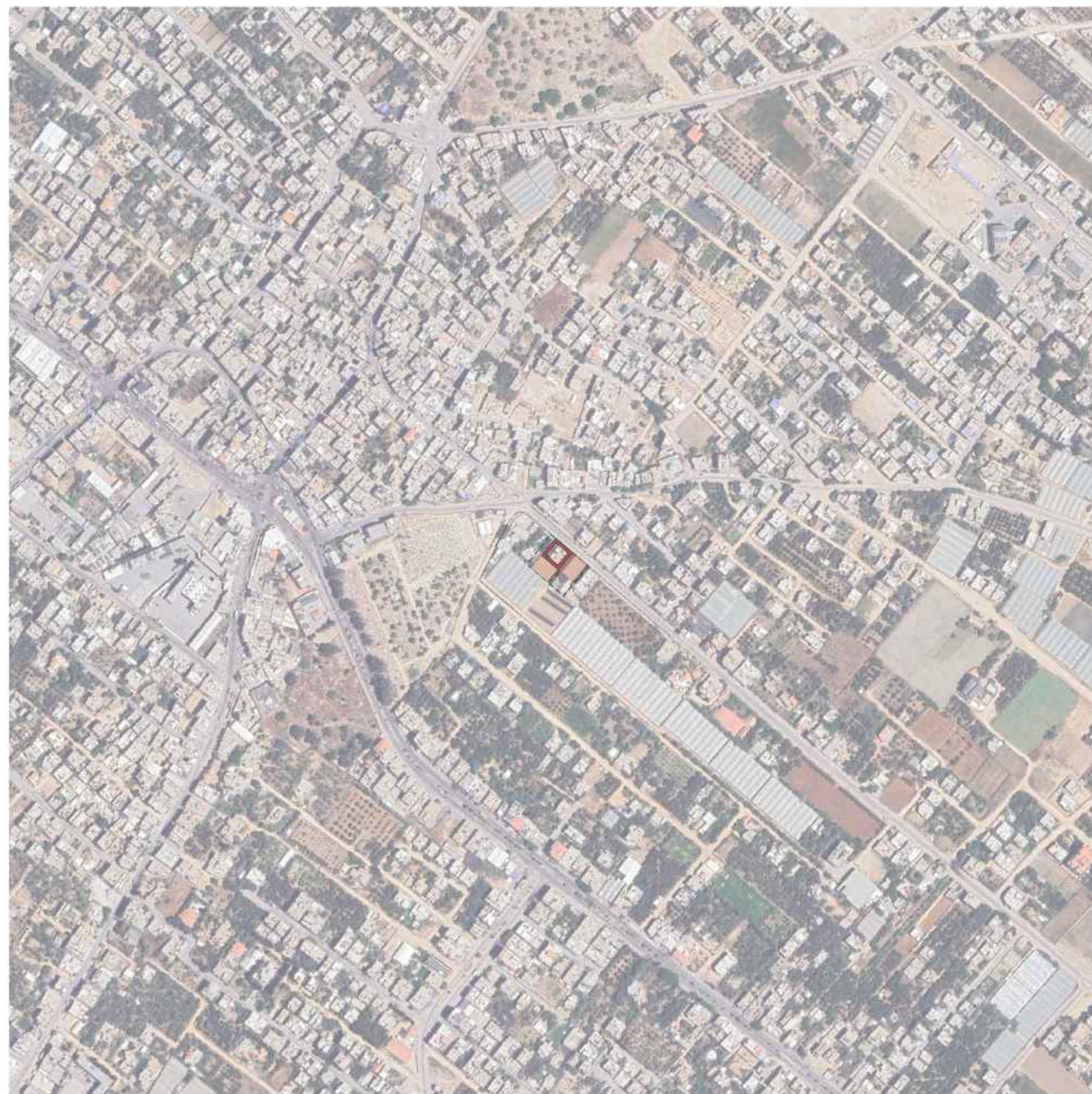


◎ PULTRUSE STRUCTURES + ENERGY ◎



◎ RUBBLE RECOVERY + WATER ◎

URBAN AREA BASED APPROACH - SAMPLES



XS - Area 2247 / Built Area 936 / Inhabitants 30

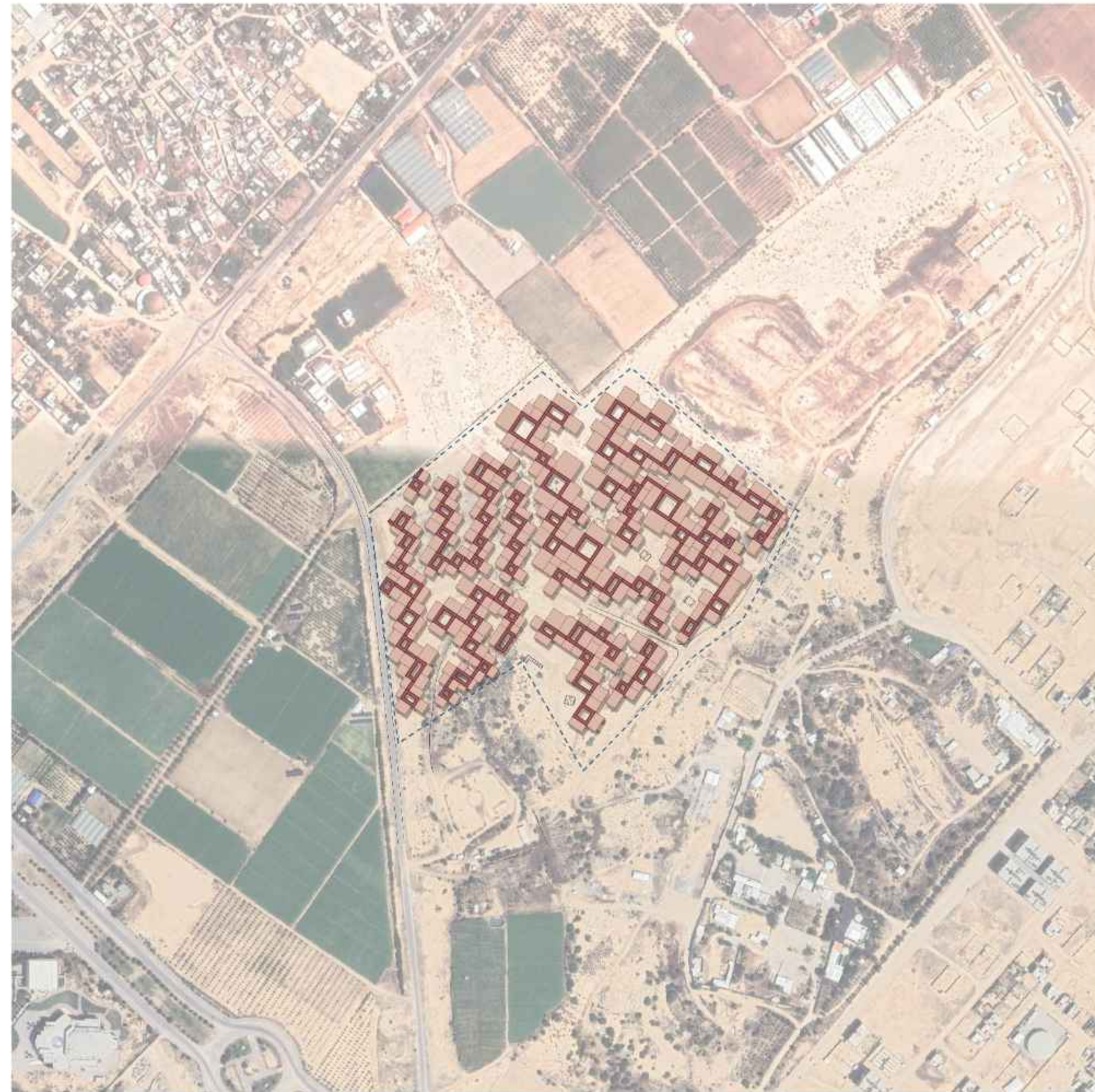


S - Area 21448 / Built Area 9684 / Inhabitants 300

URBAN AREA BASED APPROACH - SAMPLES

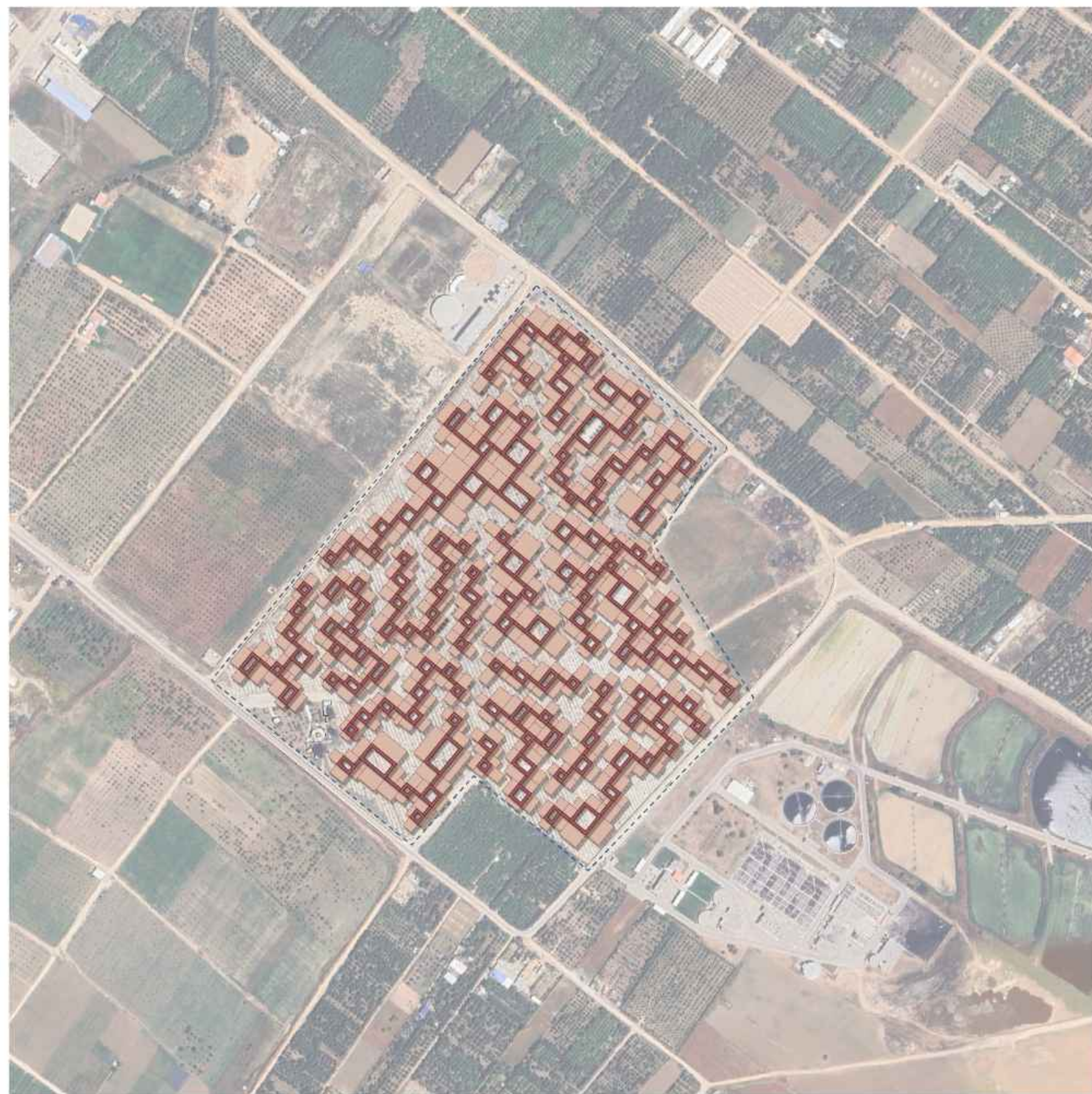


M - Area 66016 / Built Area 28549 / Inhabitants 1000

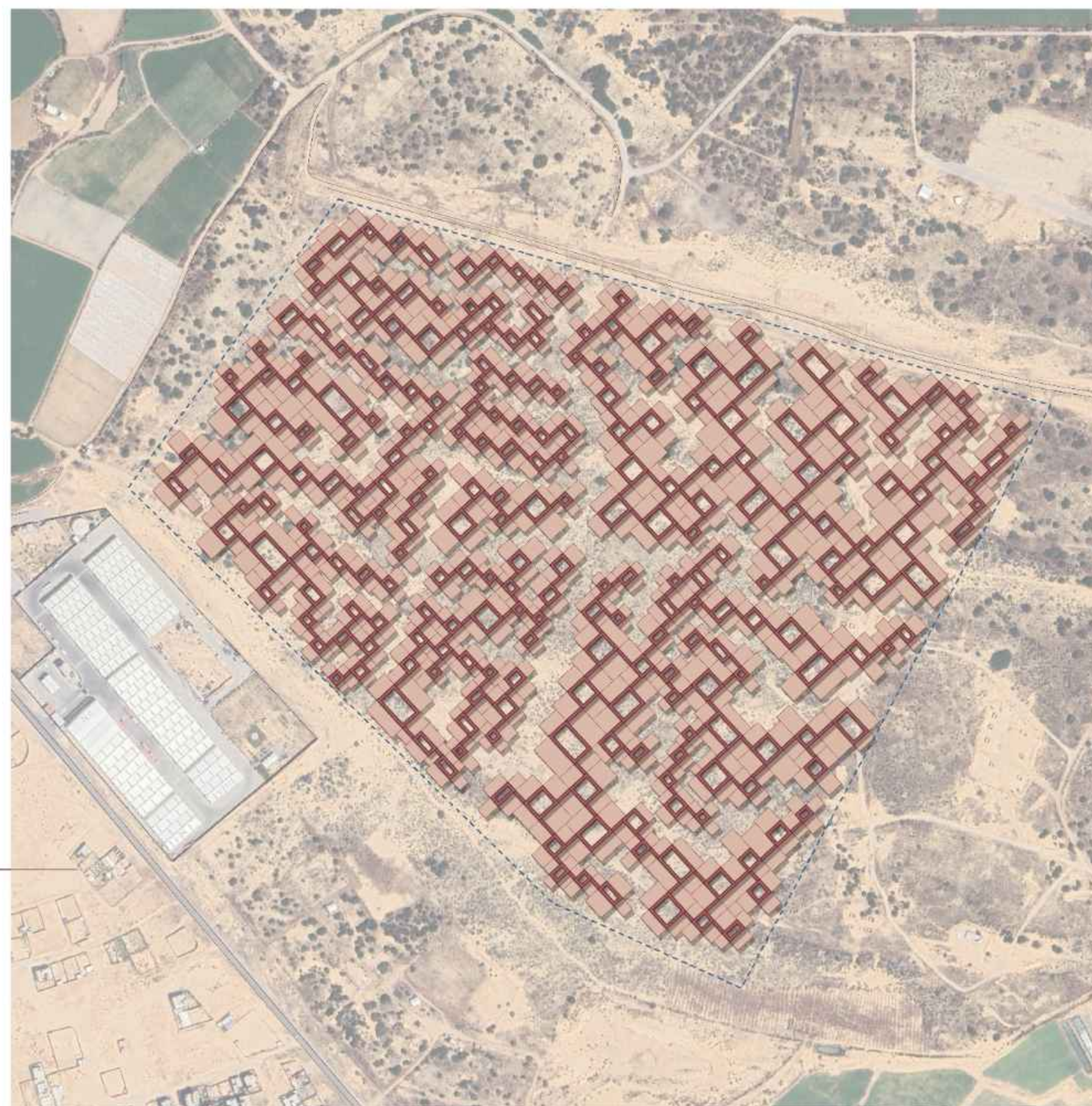


L - Area 127930 / Built Area 52237 / Inhabitants 1700

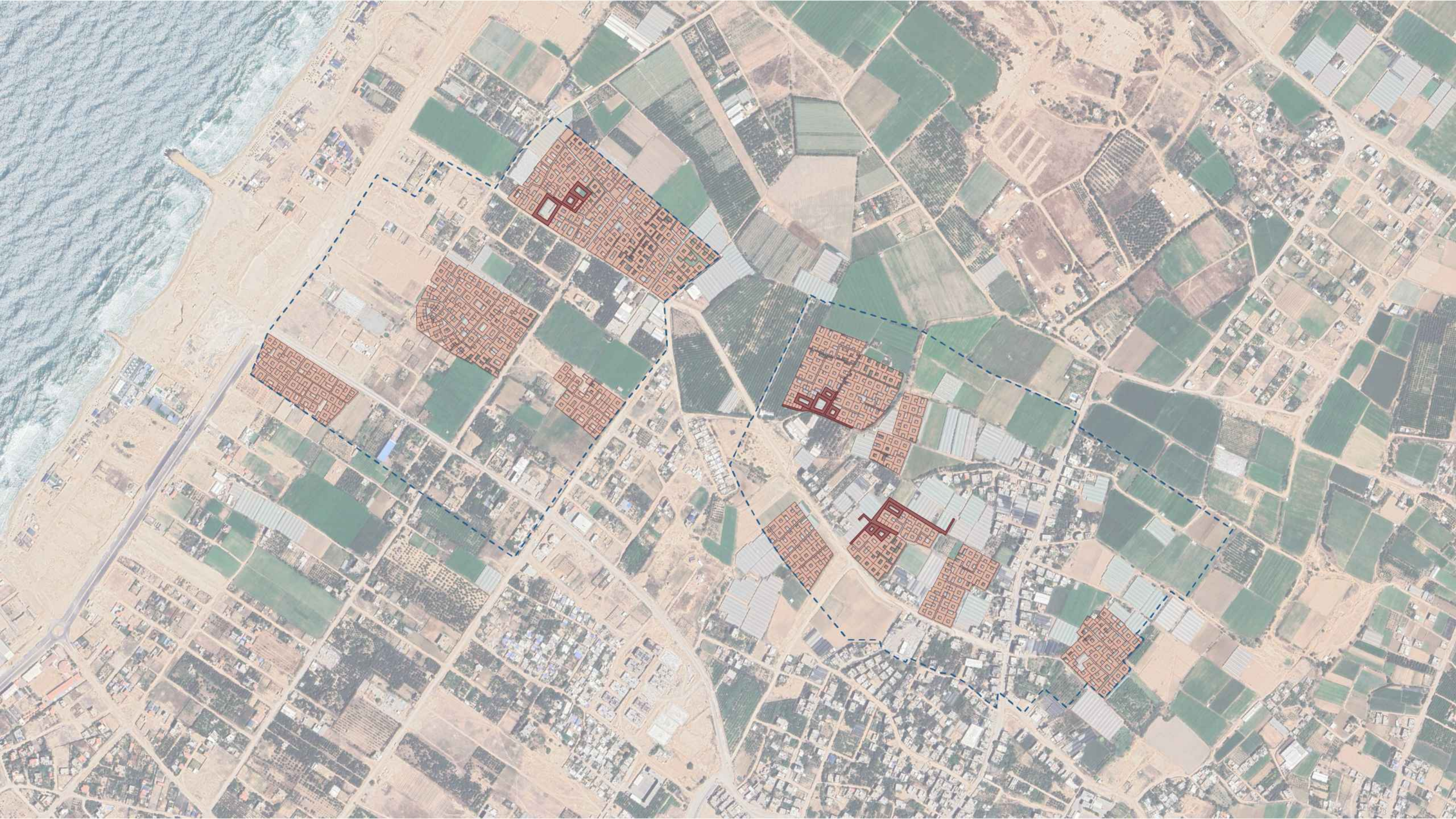
URBAN AREA BASED APPROACH - SAMPLES

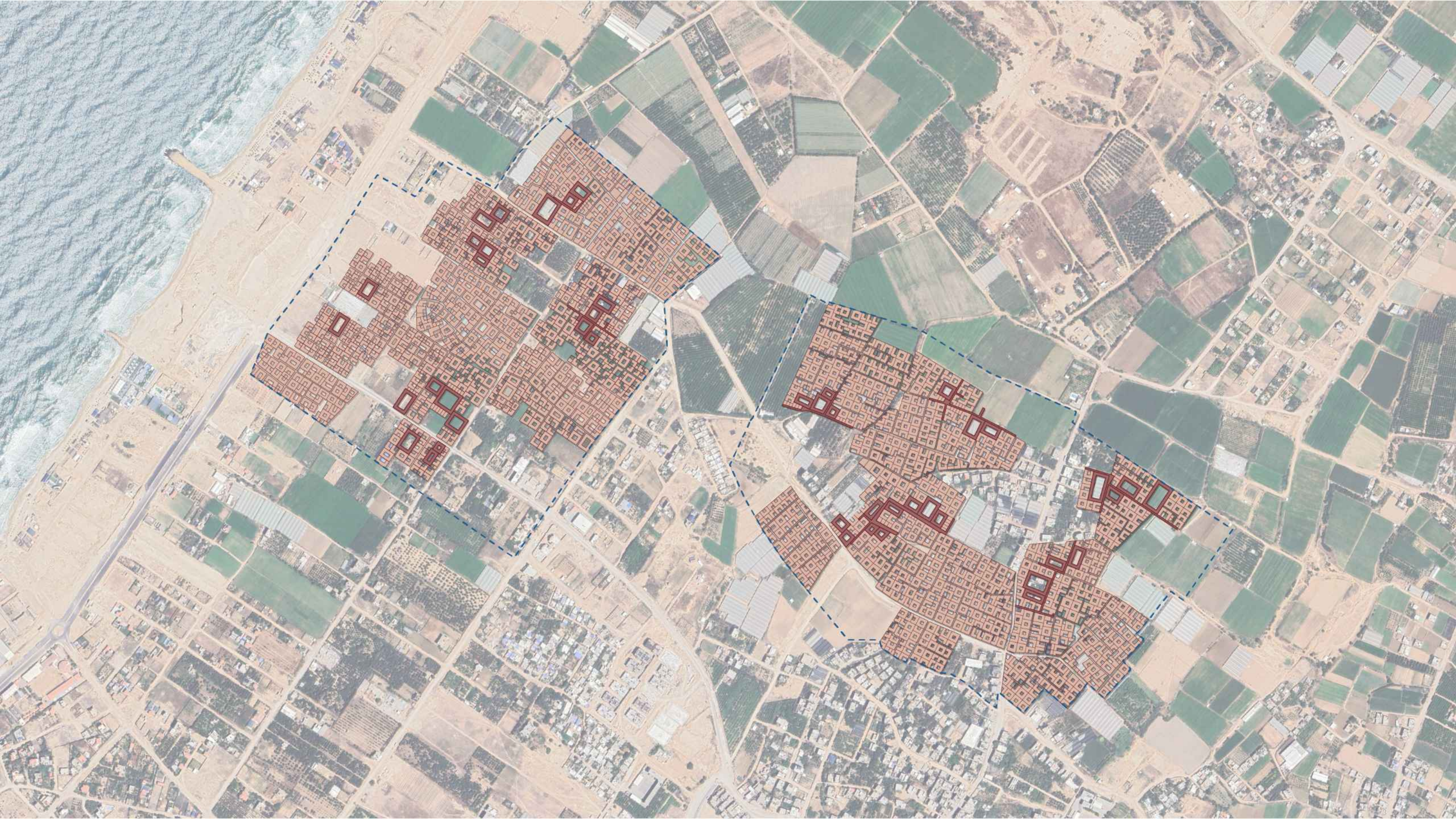


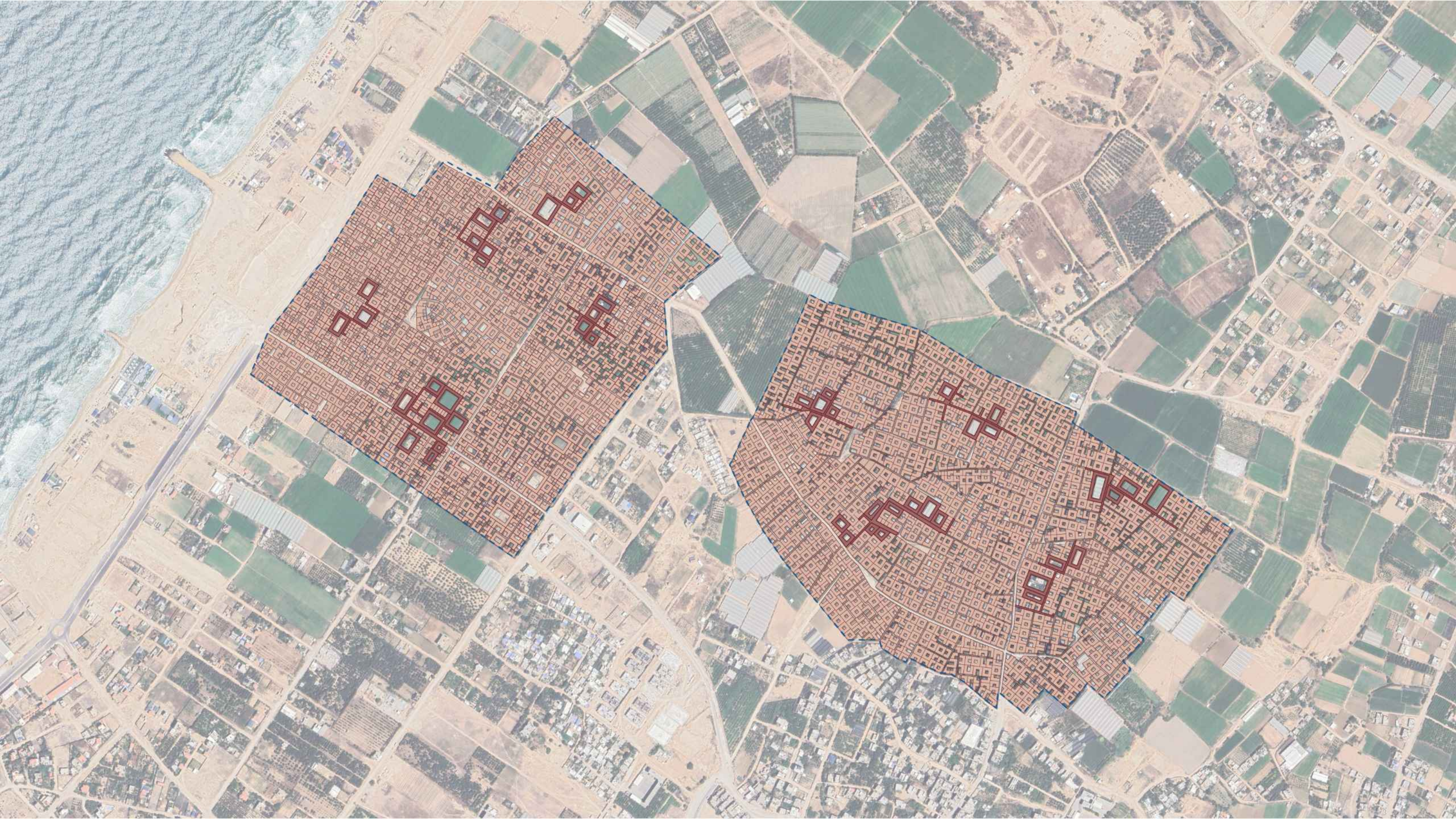
XL - Area: 209.064 / Built Area: 94.989 / Inhabitants: 3.200



XXL - Area: 425.604 / Built Area: 206.207 / Inhabitants: 32.000









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UNDP Programme of Assistance to the Palestinian People - Università Iuav di Venezia