



Ministry of Agriculture,
Food and Rural Affairs
Republic of Korea

STATISTICS FROM SPACE

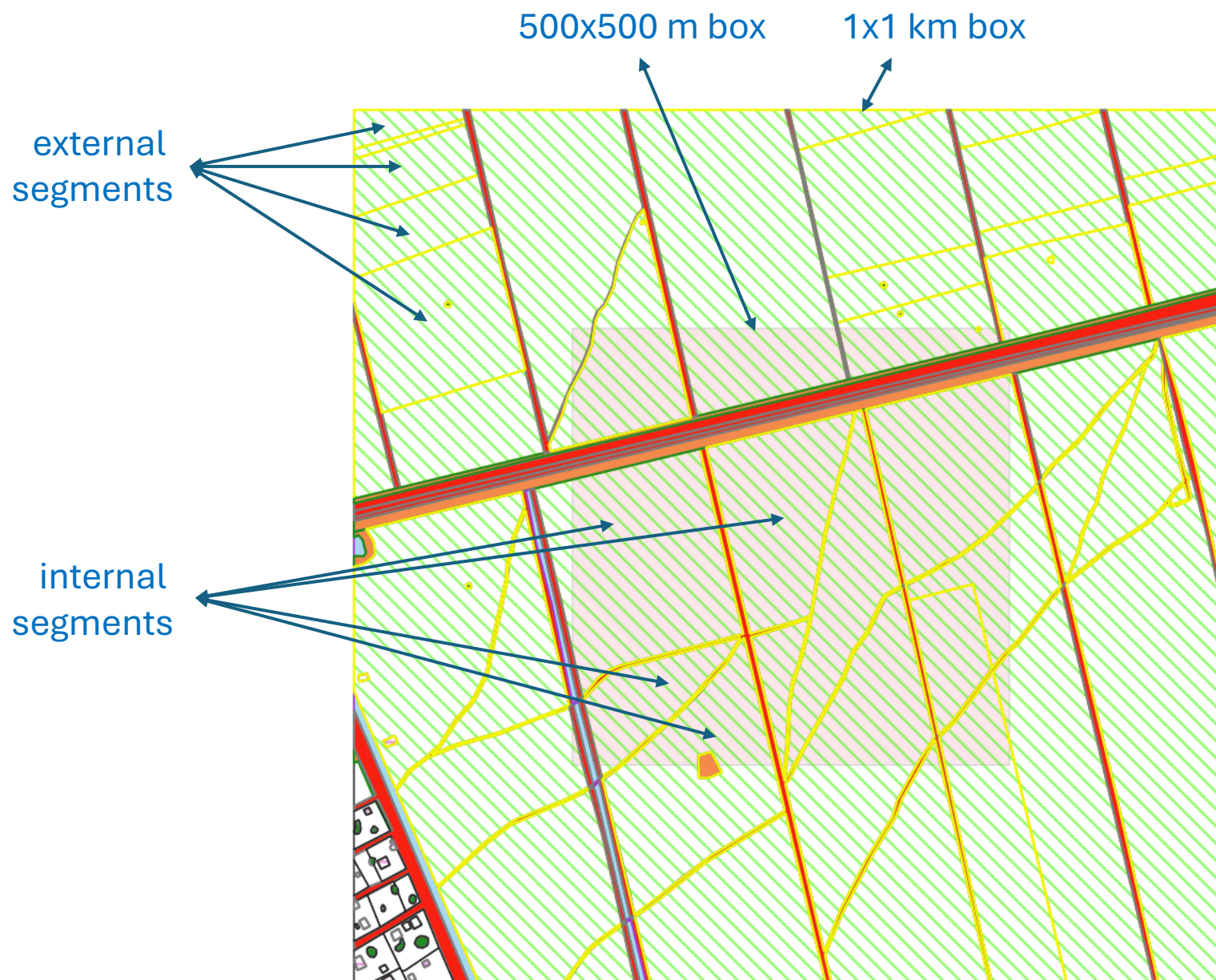
Sampling scheme & Crop area determination @ Gaza province

Work Package 2 [Enhanced Area Sampling]

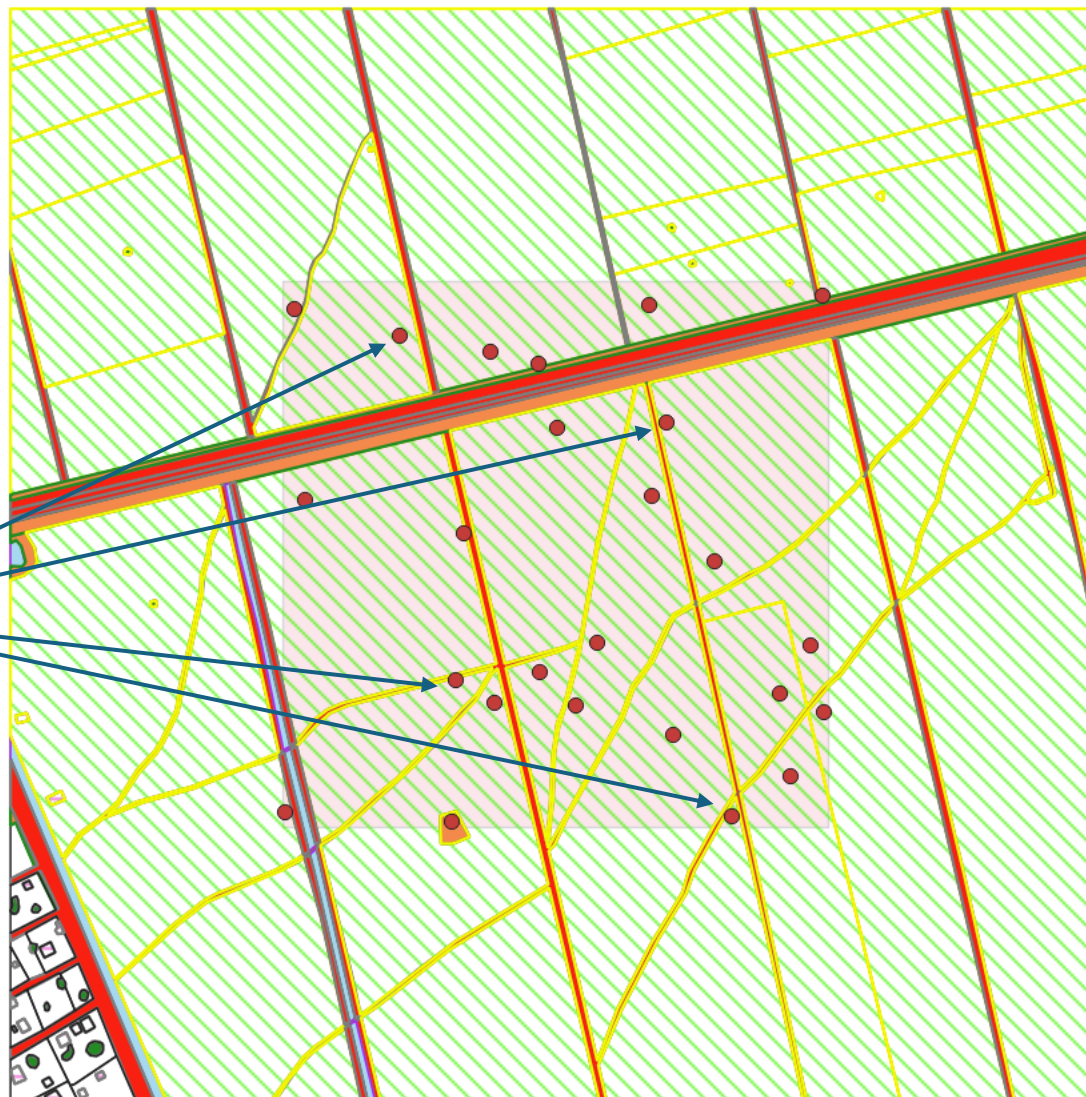
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- 149 **Sampling Areas (SAs)** to represent 27 farming strata
- randomly selected
- nr of SAs per stratum represents relevance for farming intensity
- 97 SAs scheduled for visit; 52 in reserve
- an SA is a 500x500m box for which a homogeneous polygonic segment cover has been prepared by image interpretation
- field visits to label the segments with crop data



fieldwork
data
points





improper
segment
data point
correspondence

proper
1:1 segment
data point
correspondence

Strategy of crop acreage determination

- Determine per crop at segment level
- Aggregate to SA level
- Aggregate to stratum level
- Aggregate to study unit level (being municipality, (sub)district, province, nation or ...)

Crop acreage determination



Known a priori

- $P_{vis}(S_n)$: set of visited SAs p in stratum S_n
- $\alpha(s_i)$: area size of segment s_i inside SA's box500
- $\alpha(p_k)$: total area size of SA p_k (max 250,000)

Known a priori and possibly adjusted during fieldwork

- $\sigma_{cult}(p_k)$: set of cultivated segments s in SA p_k

Determined during fieldwork

- $\rho(s_i, c_j)$: ground cover percentage of crop c_j in segment s_i
(for part inside SA's box500)
- $\sigma_{viscult}(p_k)$: set of visited cultivated segments s in SA p_k
- $\sigma_{notviscult}(p_k)$: set of not visited cultivated segments s in SA p_k

We work in [m²], eventually convert to [ha].

Aggregation at SA level

$$segment_crop_area(s_i, c_j) \equiv \alpha(s_i) \cdot \rho(s_i, c_j)$$

$$sa_crop_area_obs(p_k, c_j) \equiv \sum_{s \in \sigma_{viscult}(p_k)} segment_crop_area(s, c_j)$$

$$sa_cultivated_area(p_k) \equiv \sum_{s \in \sigma_{cult}(p_k)} \alpha(s)$$

$$sa_crop_area(p_k, c_j) \equiv sa_crop_area_obs(p_k, c_j) \cdot \frac{sa_cultivated_area(p_k)}{\sum_{s \in \sigma_{viscult}(p_k)} \alpha(s)}$$

Aggregation at stratum level

$$\text{stratum_crop_area}(S_n, c_j) \equiv \sum_{p \in P_{vis}(S_n)} \text{sa_crop_area}(p, c_j)$$

$$\text{stratum_eas_area}(S_n) \equiv \sum_{p \in P_{vis}(S_n)} \alpha(p)$$

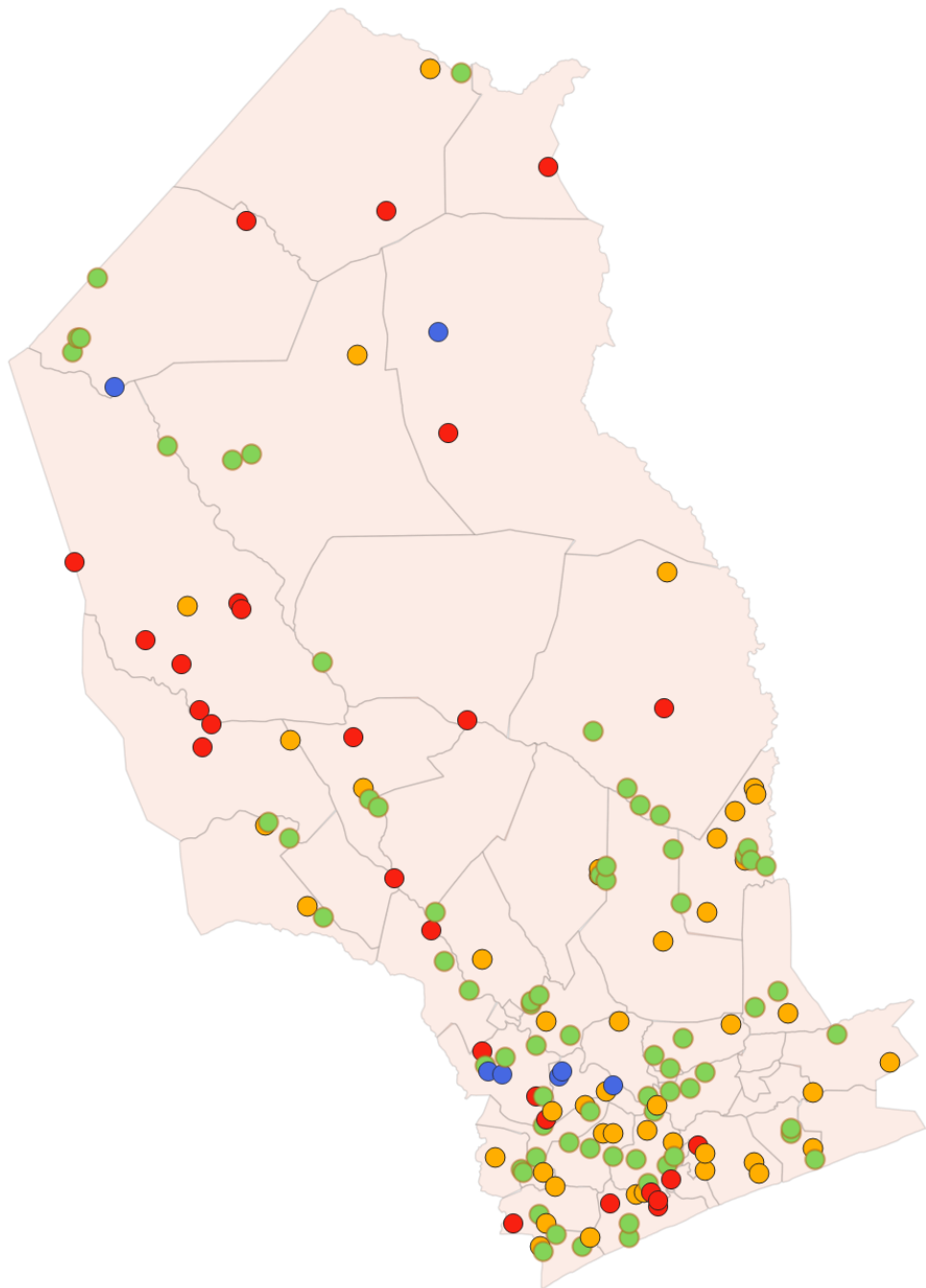
$$\text{stratum_crop_percentage}(S_n, c_j) \equiv \frac{\text{stratum_crop_area}(S_n, c_j)}{\text{stratum_sas_area}(S_n)}$$

Aggregation to study unit level

Given any spatial unit U and a crop c_j , we can compute the crop area:

$$\text{crop_area}(U, c_j) \equiv$$

$$\sum_n \text{area}(\text{intersection}(U, S_n)) \cdot \text{stratum_crop_percentage}(S_n, c_j)$$



SAs



70 scheduled and visited

7 not scheduled but visited

27 scheduled but not visited

45 not scheduled nor visited



INITIATIVE ON
Digital Innovation



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