Egypt 2017 E-Census

Central Agency for Public Mobilization And Statistics

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Our Census …Our Future

Improving Cartographic Mapping and Household-level geo-referencing in The Egyptian Census 2017

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Overall Supervisor, Egypt 2017 Census

Agenda

I. Egypt: Census History

II. Census 2017: Cartographic Mapping and HH-level geo-referencing

III. Census 2017: Implications for census processes and Data usage

IV. National Spatial ID and Next Step

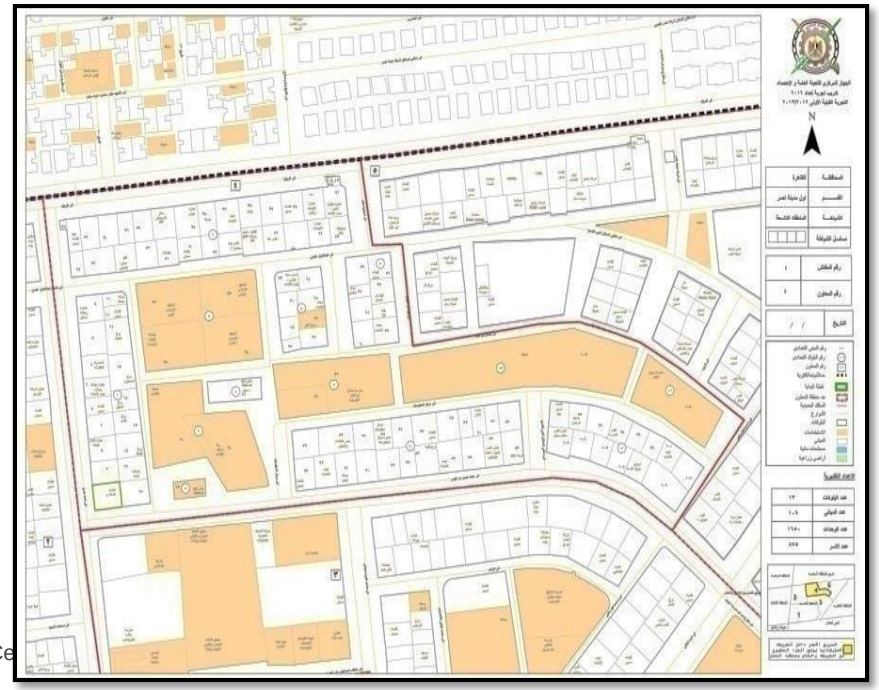
I. Census History &Switch To E-Census

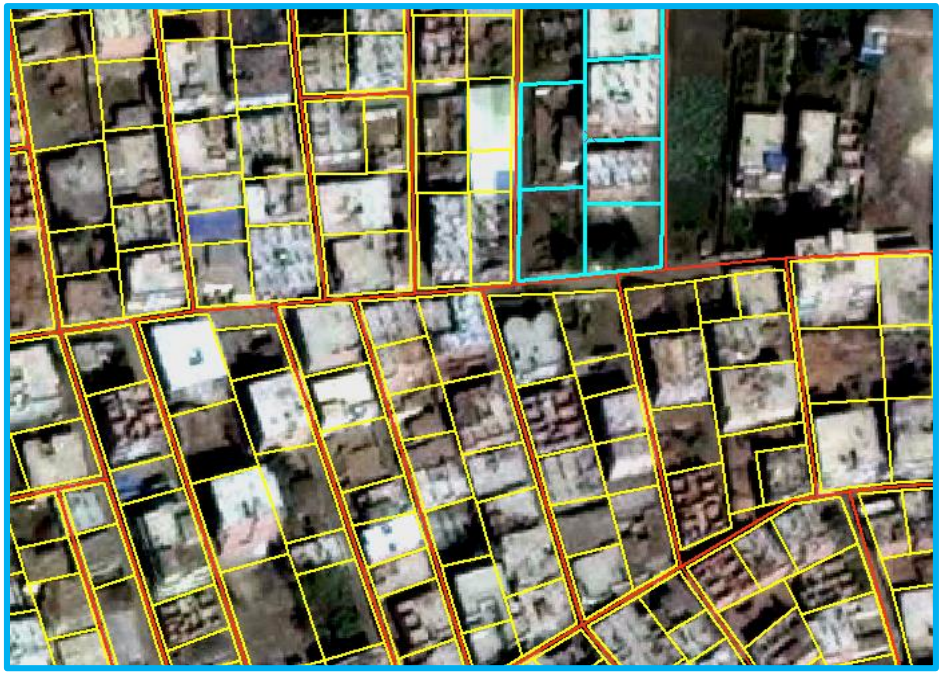
- Egypt has a long history of regular censuses undertaking since 1882;
- The 14th census, carried in 2017, adopted a fully digitized approach;
- Several factors Contributed to the decision to switch to E-Census:
  - The comprehensive mapping system project launched in 2014 to cover100% of Egypt's land and possible transfer to digital maps relevant to the E-Census,
  - Adopting two forms for collecting census data, the Long one was fielded for 10% of households and this reduced the required number of enumerators by two thirds,
  - The outcomes of the 4th pilot test that was carried out using both traditional and E-application that documented significant achievements of the e-system regarding coverage, data quality, management & field control, time saving, and long-term cost reduction,
  - High-level support to the utilization of the E-approach,
  - The successful implementation of the E- Censuses by some countries.

II. E-Census 2017: Cartographic Mapping and HH-level geo-referencing

Census Mapping (using detailed Digital Maps Scale 1:500)

Building Level





II. E-Census 2017: Cartographic Mapping and HH-level geo-referencing

New approaches in Census 2017

Census Mapping (digital Maps Scale 1:500)

Covers 100 % of Egyptian Land

	Census 2006	Census 2017
Urban	70 %	100 %
Rural	0 %	100 %

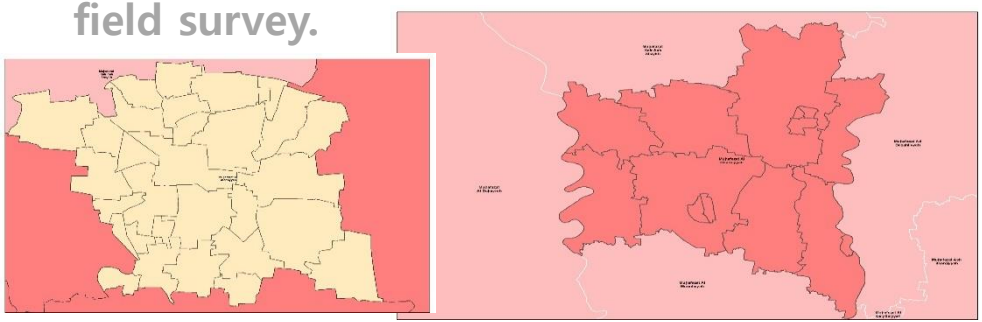
II. E-Census 2017: Steps for the Preparation & Production of Cartographic Mapping for the Census

First Step	Second Step	Third Step	Fourth Step
Collect Satellite Images (Base Maps)	Update Satellite Base Maps	Validate Administr-ative Boundaries& Draw areas needed to be covered	Printing Updated Maps and Verify through field work
Fifth Step	**Sixes Step**	**Seventh Step**	**Eight Step**
Field Information Inventory, Numbering buildings and blocks and uploading any other updates to the map	Upload all Updates to Geographical Database	Specify Enumerators Work areas 31,500 Areas	Upload Enumerators' Work areas on the Tablet

II. E-Census 2017: Applying Census Mapping Techniques Program (CMTP)

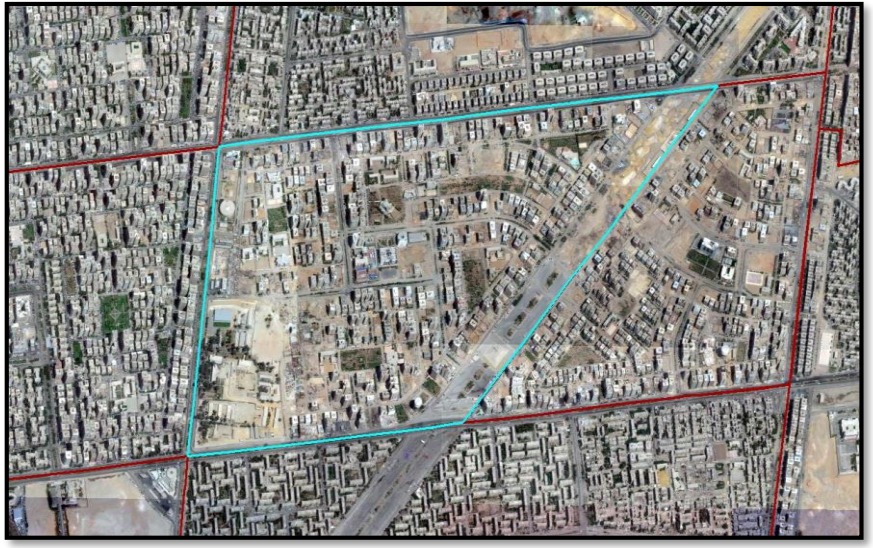
Household-Level Geo-referencing and data base development:

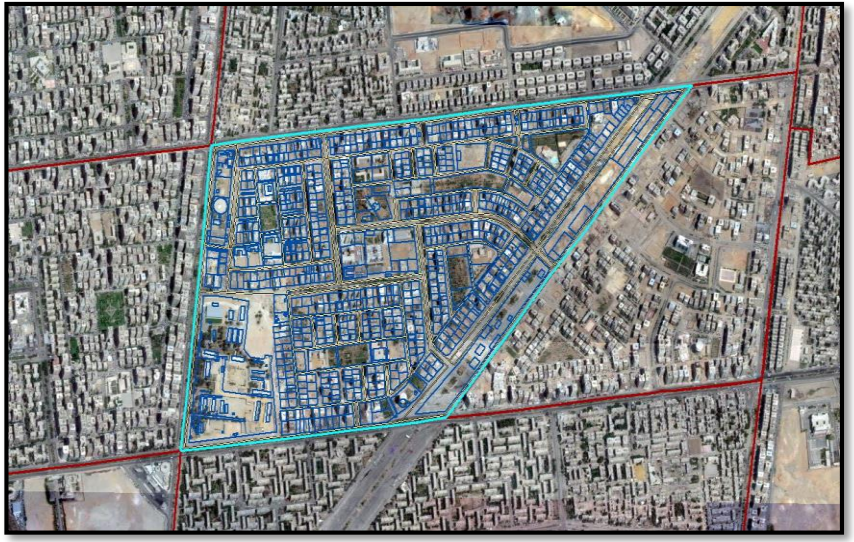
i. **Update administrative Boundaries based on recent images.**
ii. Create & Update the base maps using new satellite images.
iii. Update the base maps using field survey.



II. E-Census 2017: Applying Census Mapping Techniques Program (CMTP)

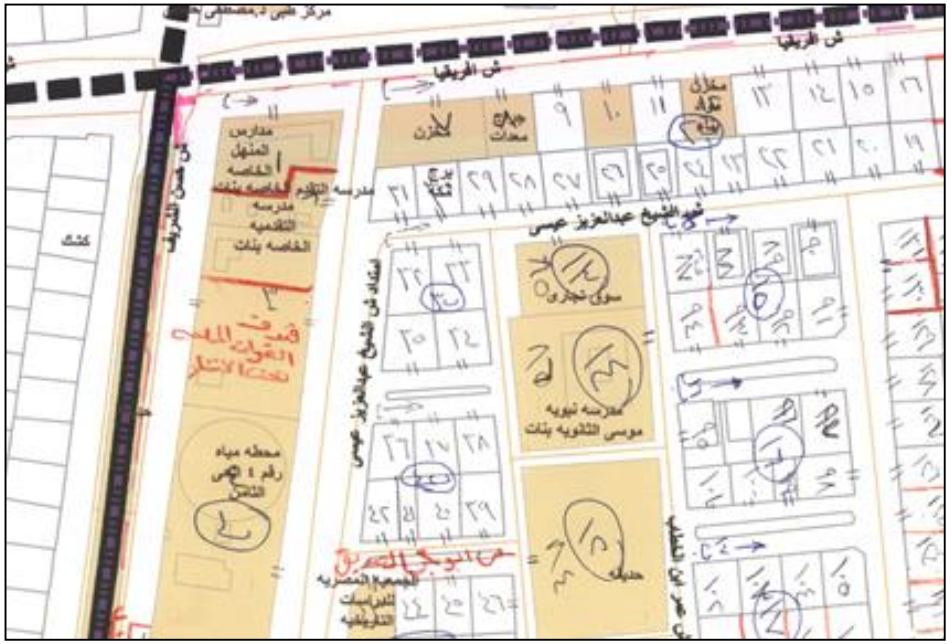
i. Update administrative boundaries based on recent images.
ii. **Update the base maps using new satellite images using ARC/GIS Software**
iii. Update the base maps using field survey.





II. E-Census 2017: Applying Census Mapping Techniques Program (CMTP)

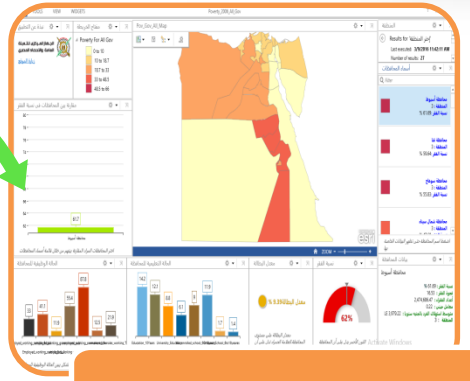
i. Update the administrative boundaries based on recent images.
ii. Update the base maps using new satellite images.
iii. Update the base maps using field survey data providing number of buildings and households.



II. Census 2017: Role of Census Mapping

1.Pre-Enumeration Stage

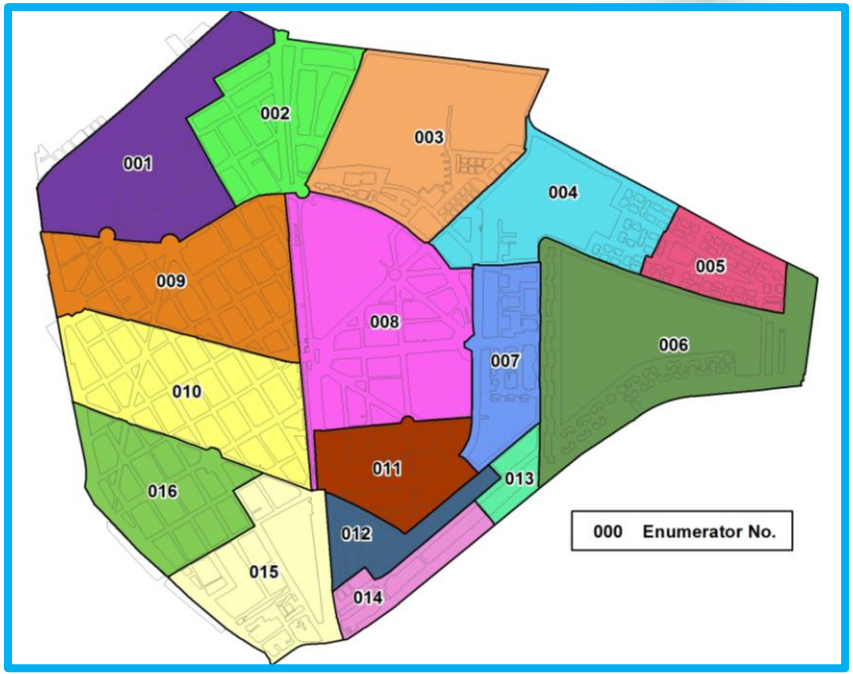
2-During Enumeration Stage



3- Results Dissemination Stage

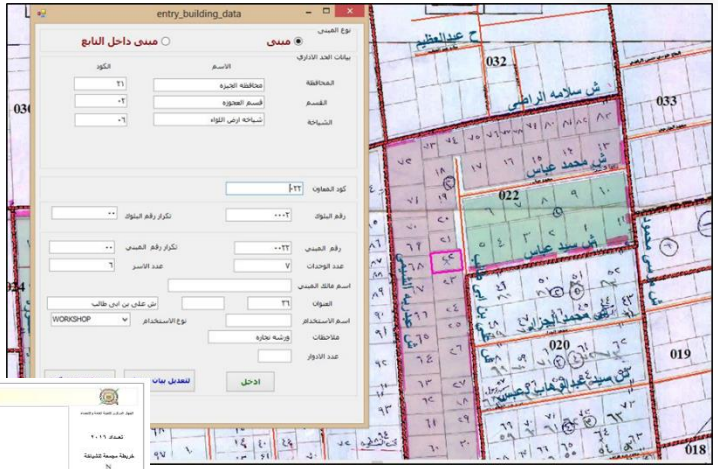
II. Census 2017: Role of Mapping in the Pre-Enumeration Stage

- Using updated digital maps with the number of buildings and HHs, census field areas were created based on:
  - ✓ Enumeration Area (EA): having either 1500 units or 1000 HHs, with clear boundaries,
  - ✓ Supervisory Area (SA): having around 15 thousand units or 10 thousand HHs.
- A total of 31,500 enumeration areas were created according to the above criteria.

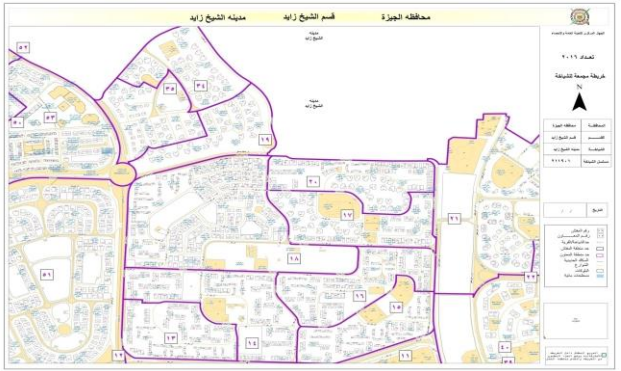


II. Census 2017: Role of Mapping in the Pre-Enumeration Stage

- The process secure full coverage of all areas of Egypt (100% Coverage),
- Ensure Maps consistency and facilitate census operations,
- Identify the required number of labour force, at various levels, and their geographical distribution.



- Assign Enumeration Areas to individual Enumerator to be uploaded on the tablet



III. Census 2017: Implications for census processes and Data usage (Enumeration Stage)

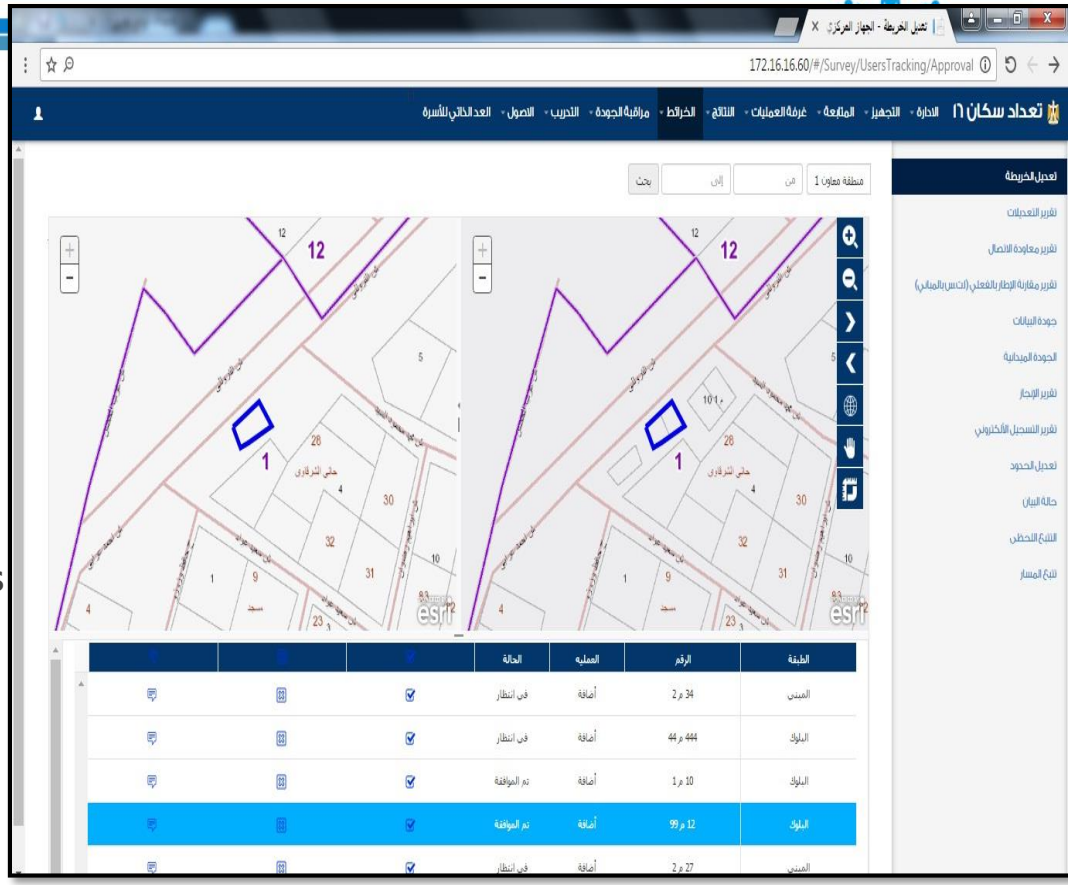
The Implications of Improving Cartographic Mapping and Household-level geo-referencing can be highlighted in the following areas:

- **Coverage**
- **Data quality,**
- **Management & Field control**
- **Time saving, and,**
- **Cost reduction**

III. Census 2017: Implications for census processes and Data usage

Coverage:

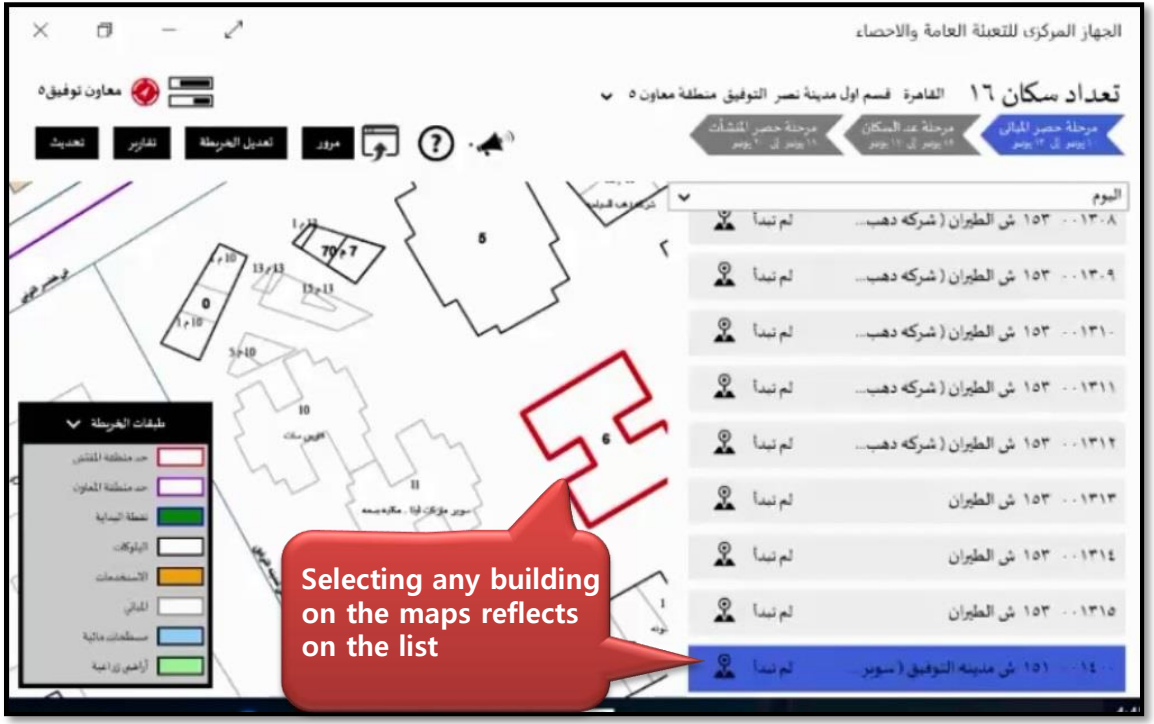
- Creating Geographic information system covering100% of Egypt land secured census comprehensive coverage and avoided any omissions and/or overlaps,
- Verify uploaded maps and allow enumerator's update based on current status. This is carried out at three levels (building, block and roads),
- Updates are to be approved by the supervisor and would be revised by HQ/GIS staff for finalization.



III. Census 2017: Implications for census processes and Data usage

Coverage

- Automatic Synchronization of map and household list on the tablet would enhance coverage:
  - ✓ Allow accessibility to work areas and reduce non-response
  - ✓ Jumping the sequence of any building requires justification.
- Spatial and tabular Update



III. Census 2017: Implications for census processes and Data usage

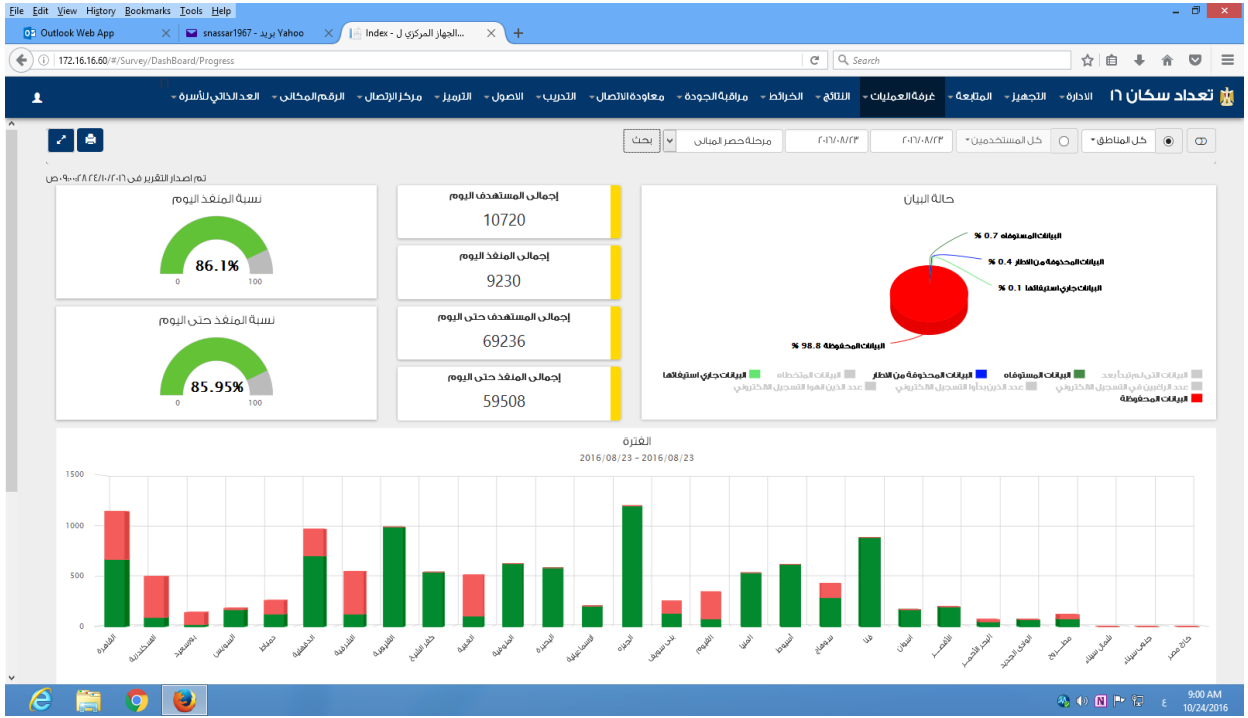
Data Quality

- Validation rules to enhance accuracy, and their systematic update based on worker's behavior,
- Completeness of data response (no missing answer),
- Repetition detection,
- Illogical data detection,
- Data entry patterns validation,
- Assess geo-areas outcome with indicators from other sources.

III. Census 2017: Implications for census processes and Data usage

Management & Field Control

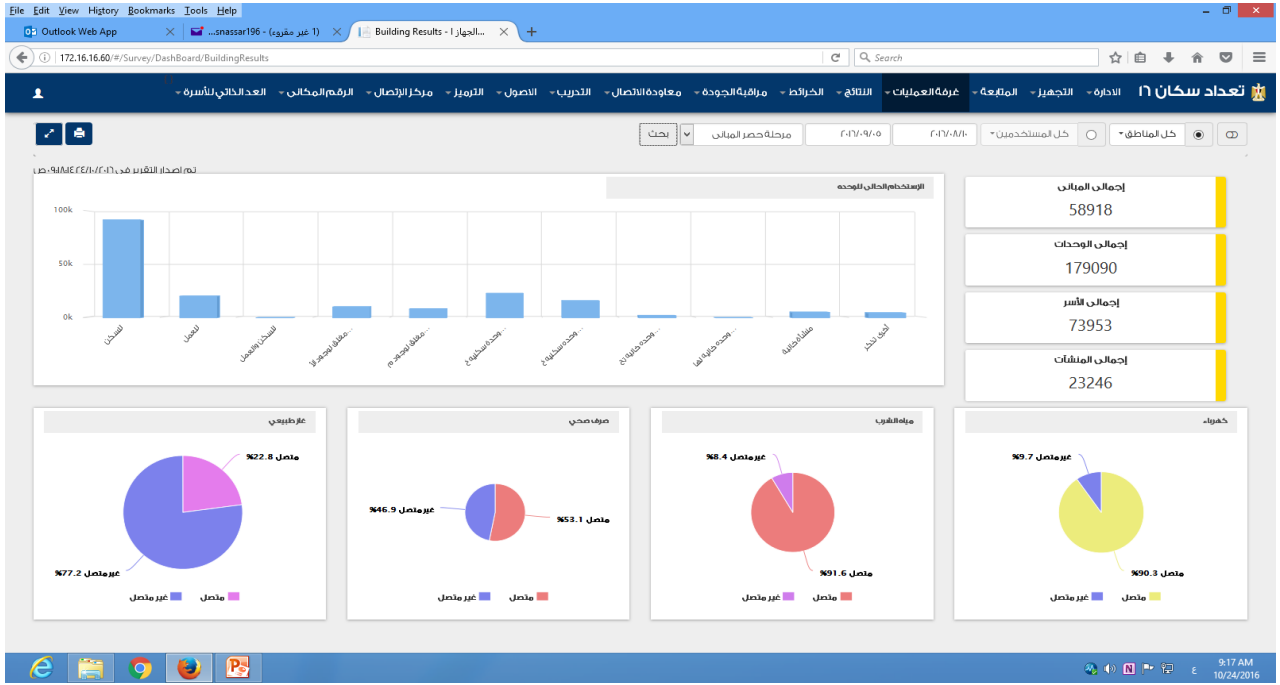
- Instantaneous monitoring of progress at various geo-areas, through a management system providing a set of reports showing:
  - ✓ Progress at various levels: governorates' and lower administrative units.



III. Census 2017: Implications for census processes and Data usage

Management & Field Control

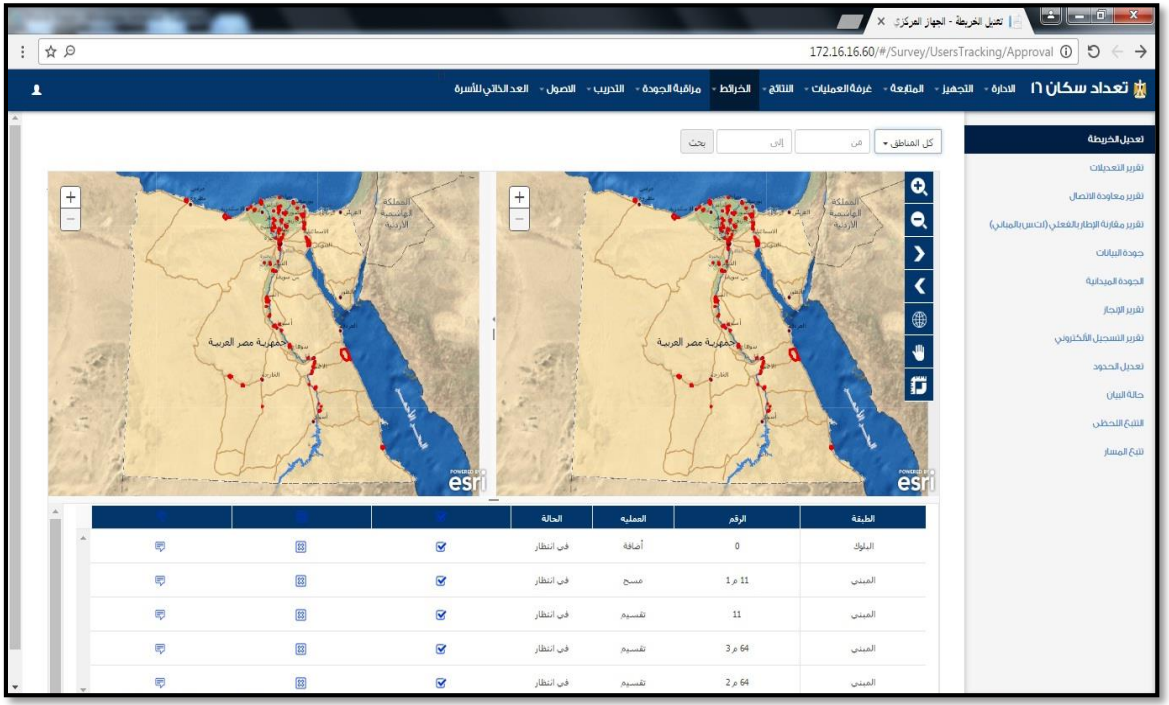
- Full Report of preliminary results for different variables, at various geo-areas to assess daily changes and to compare with relevant other sources of data



III. Census 2017: Implications for census processes and Data usage

Management & Field Control

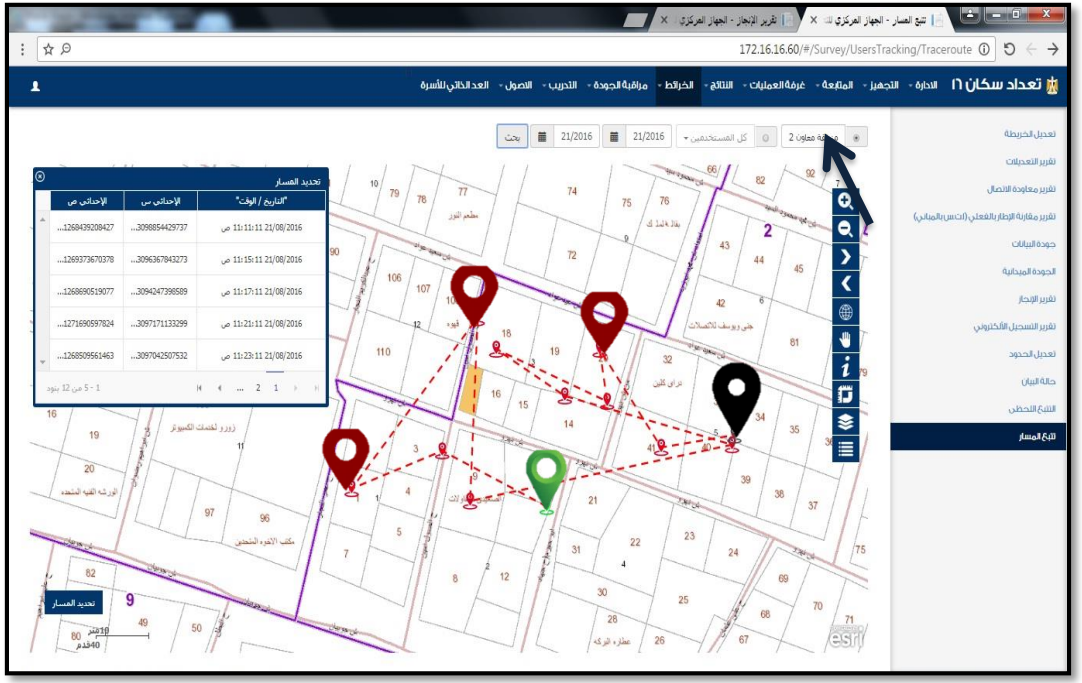
- Census management can follow up and monitor the progress of field work in real time through 3G communication system
- Identify area that requires special attention and corrective measures.



III. Census 2017: Implications for census processes and Data usage

Management & Field Control

- Field worker (FW) Route Tracking
- Instant tracking of field worker to specify his location and time
- Tablet Kiosk Mode and MDM Controlled
- Closed Data Network
- Closed Phones Network
- FW Pattern Recognition
- FW Target Vs. Achievement Report to monitor performance
- Working Zones Dynamic Assignment



III. Census 2017: Implications for census processes and Data usage

Time-Saving: The main elements

- Eliminate printing maps at various levels since it was uploaded to the tablet,
- No data entry: data is directly transmitted from the tablet to the central data base through secured lines,
- Abolish all types of manual validation and/or editing for the data, before entry, as a result of introducing E-validation rules,
- Exclude time needed for the transportation of paper forms to the field and vice-versa.

III. Census 2017: Implications for census processes and Data usage

Cost Reduction

- Transforming Expenses into Investment
- Reduce number of needed field worker dramatically due to automation (142K down to 35K + All Supporting Functions)
- Reduce cost of data entry to ZERO
- Reduce cost & effort for data processing after census to produce results (18 months to 2 months)
- Eliminate cost for papers' printing (Forms &Maps), shipping, and storage.

2017 E- Census Load of Work

95M
People

23.5M
Families

6.4M
Establishments

16.2M
Buildings

43.2M
Units

41,000
Field Agents

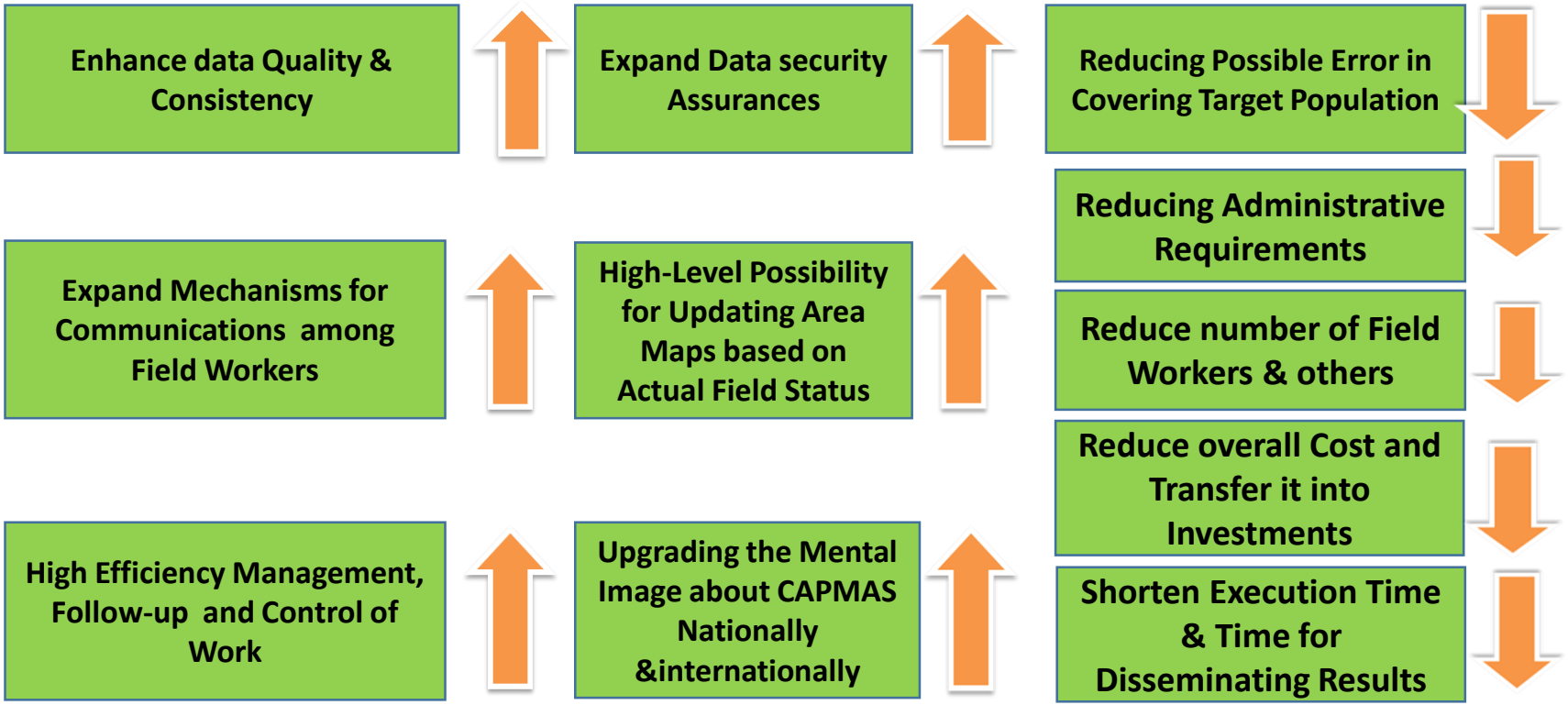
31,500
Maps

5,000 Support
People

700
Trainers

7
TB Database
4,000 Transaction
/ Sec

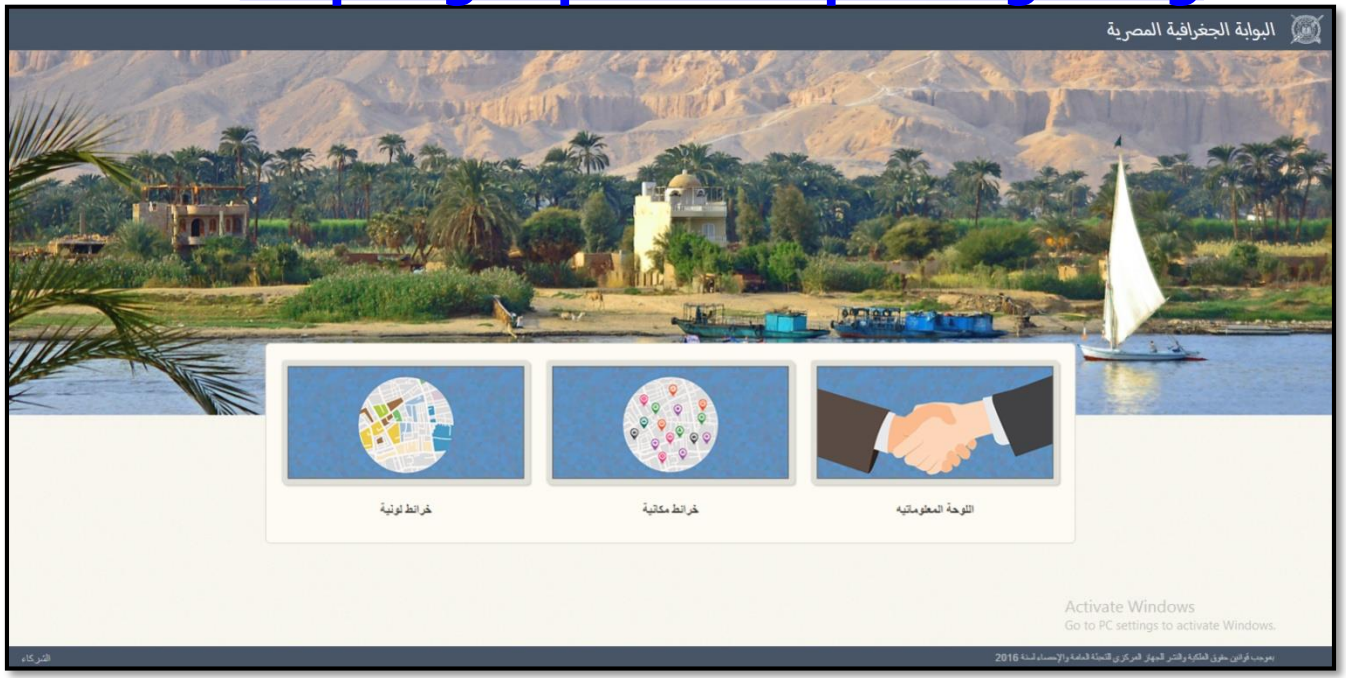
III. Census 2017: Overall Implications of Switching to E-Census



III. Census 2017: Implications for census processes and Data usage

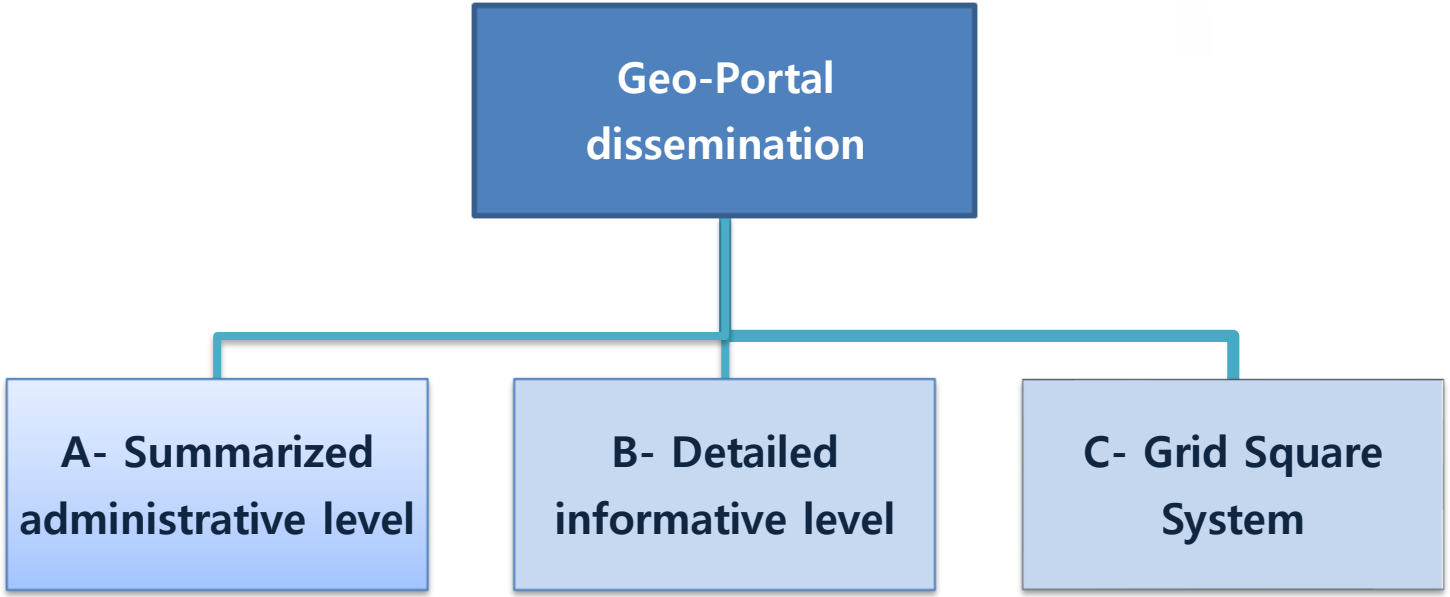
Results Dissemination: http://geoportal.capmas.gov.eg

Egyptian Geo-Portal



III. Census 2017: Implications for census processes and Data usage Census 2017

Results Dissemination:



III. Census 2017: Implications for census processes and Data usage

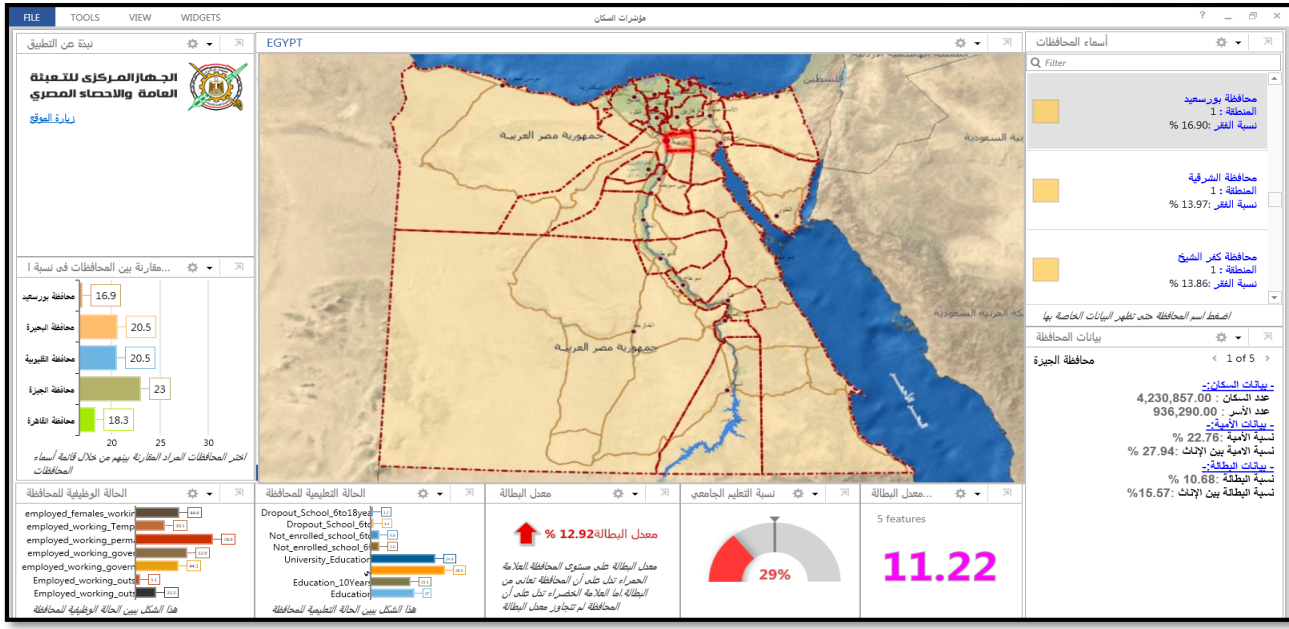
Results Dissemination:

A. Summarized administrative level:

- *Governorates Level*
- *Sections level*
- *Sub-section level*

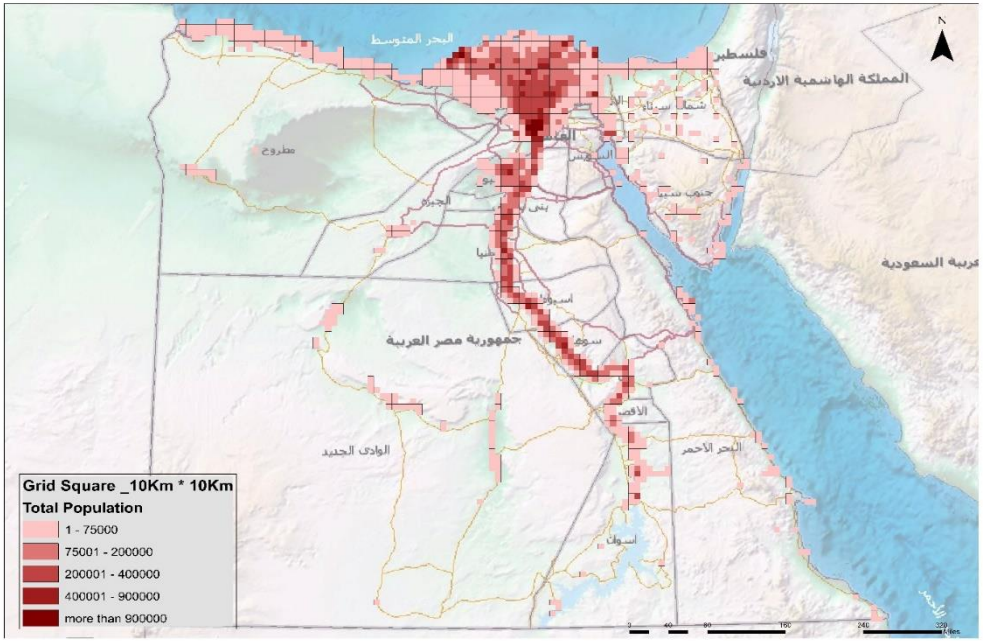
B. Detailed informative level:

- School locations
- Other landmarks
- .....

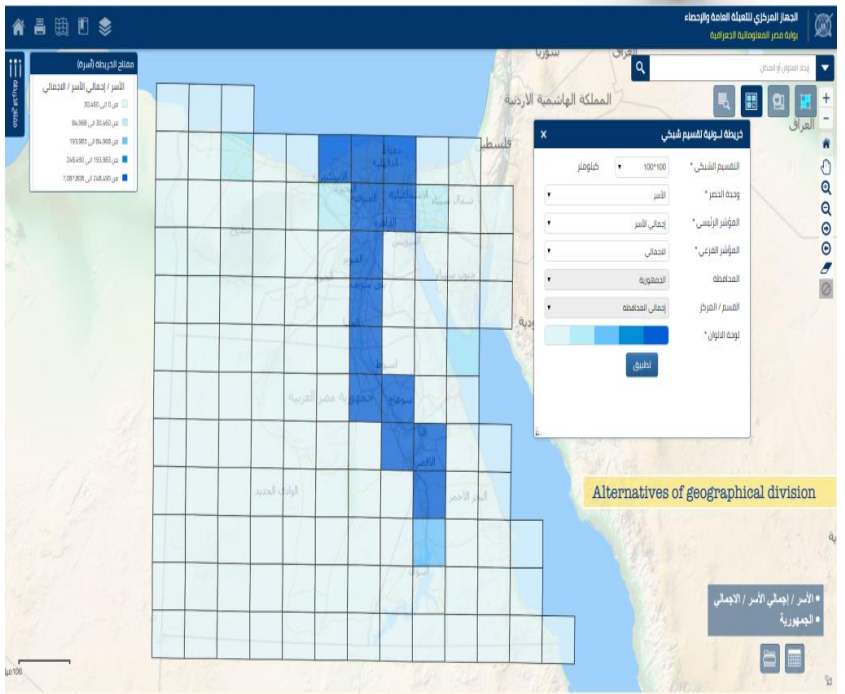


III. Census 2017: Implications for census processes and Data usage

Results Dissemination: Grid Square System



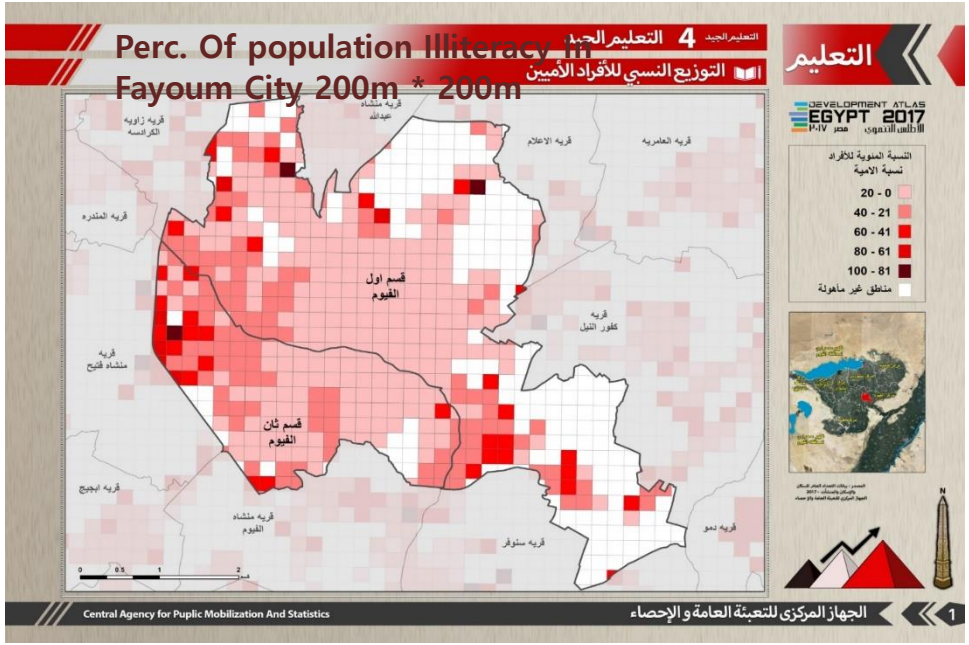
Population Distribution10KM * 10 KM



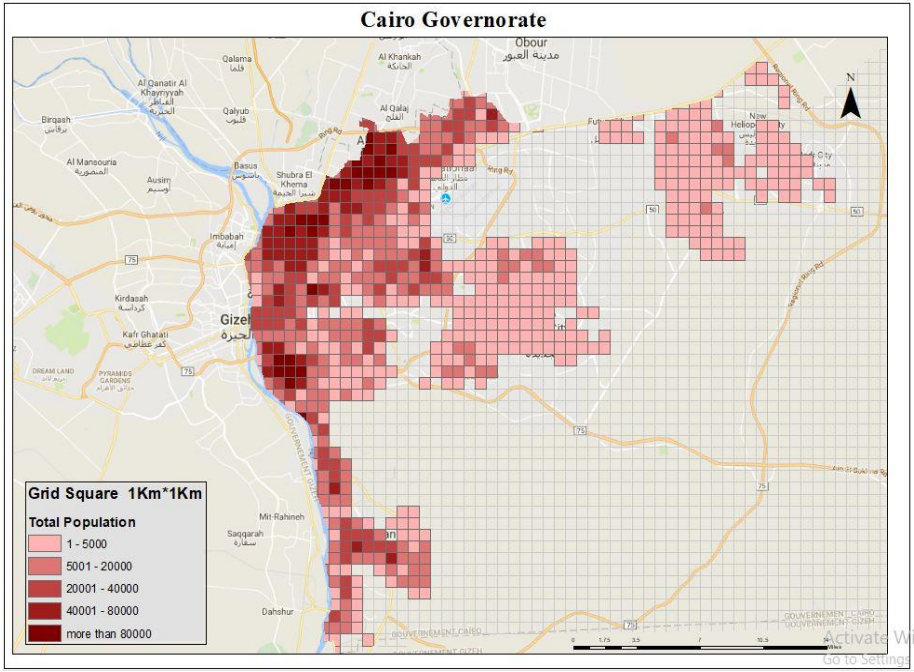
Population Distribution100KM * 100 KM

III. Census 2017: Implications for census processes and Data usage

Results Dissemination: Grid Square System



Population Distribution 200m * 200m

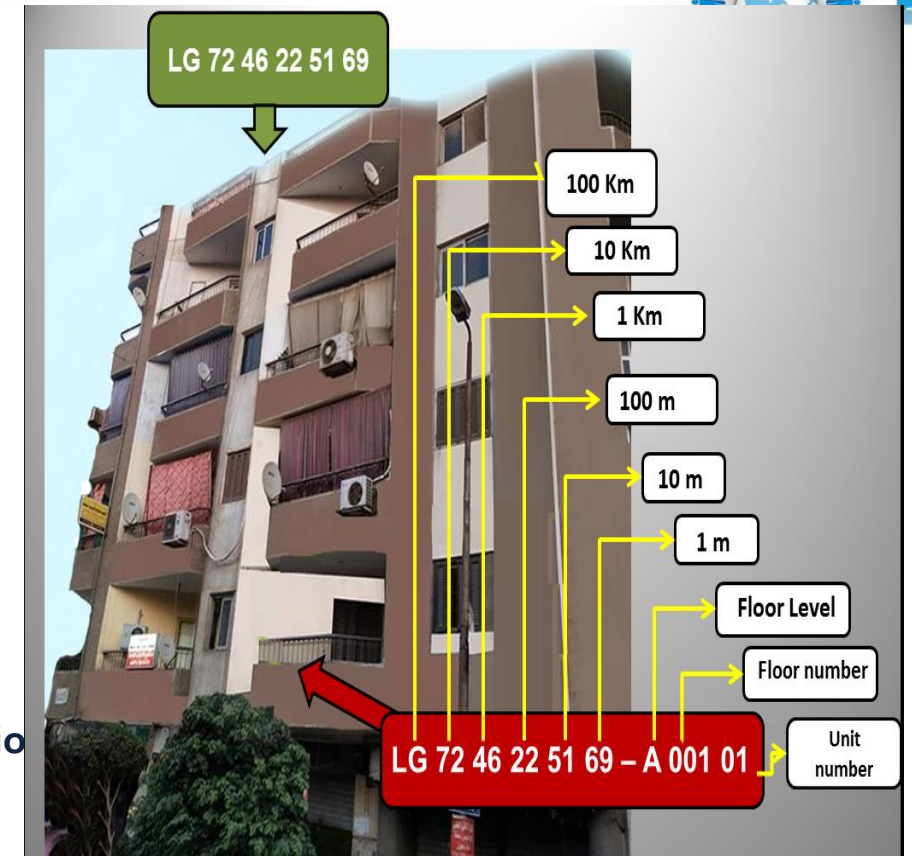


Population Distribution 1KM * 1 KM

IV. National Spatial ID & Next Steps

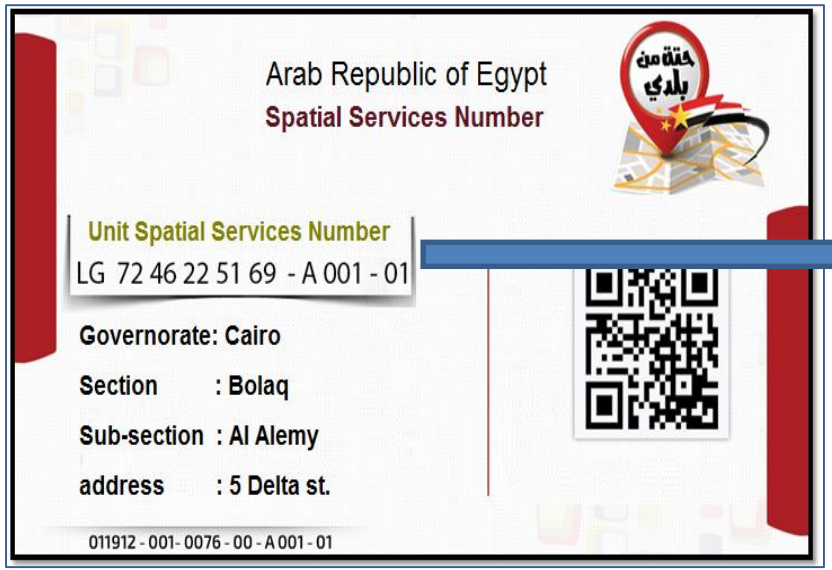
- Is a unique number for each unit within the building.
- Is produced automatically from digital maps .
- Giving a fixed number for the unit linked to its geographical location which does not change with the administrative boundaries change.
- To organize, evaluate and follow-up of local government services such as electricity, natural gas, sewage

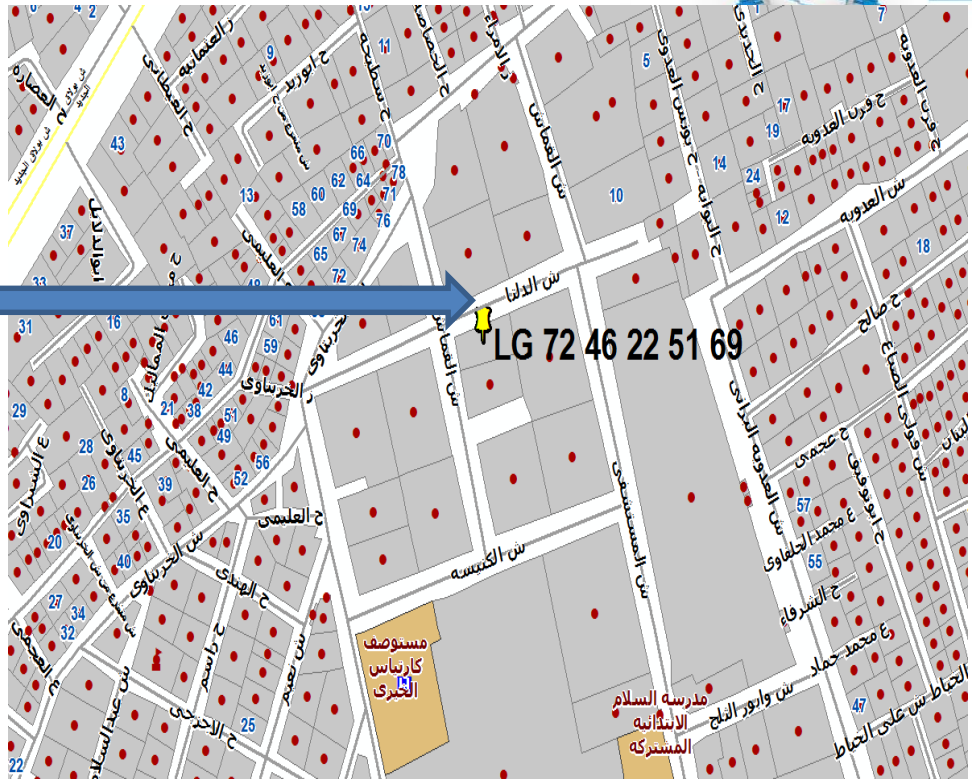
- Challenges :
  - Unified Base-map
  - Geocoding system
  - Integration between Public sector organizatio



IV. National Spatial ID & Next Steps

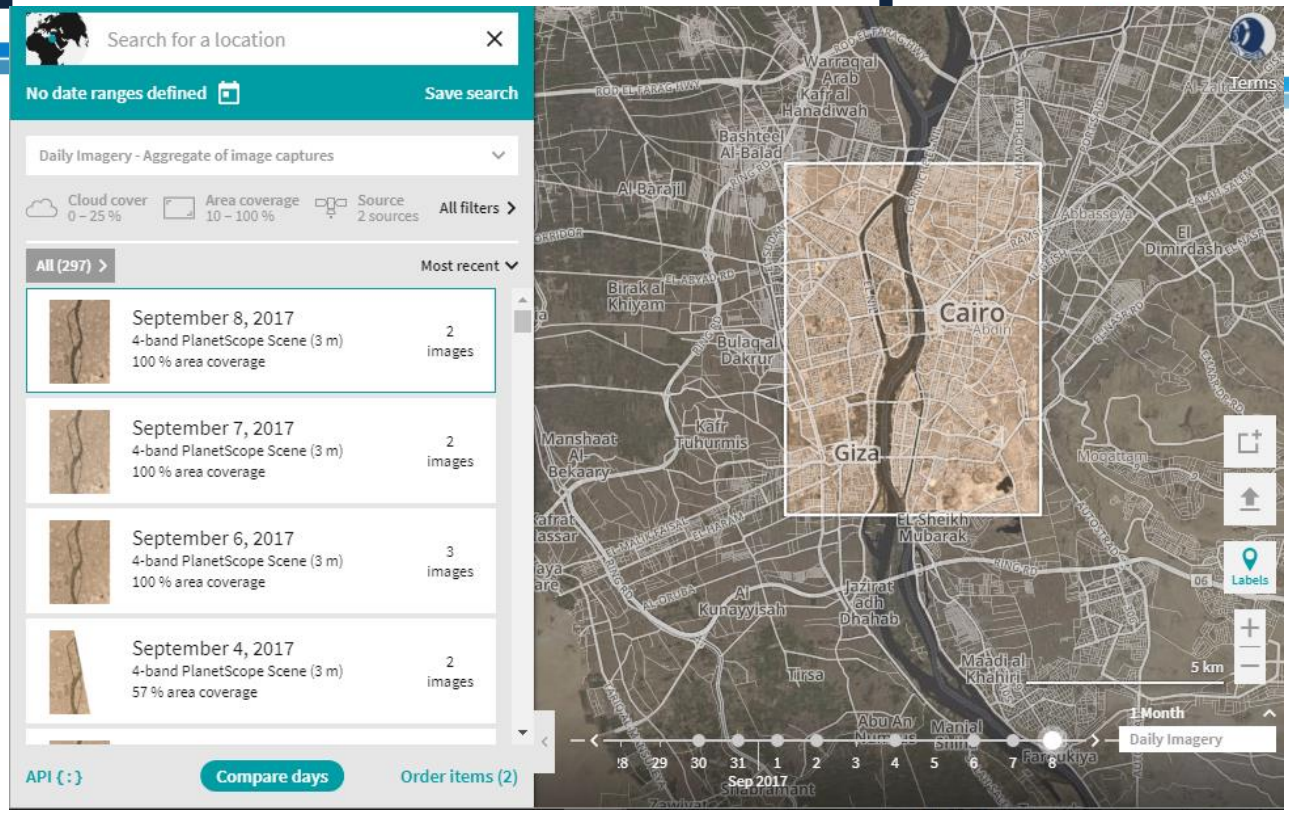
Grid Based System





IV. National Spatial ID & Next Steps

- **Frequent update for the Base Maps using:**
  - ➢ **Aerial photos by various Responsible Authorities,**
  - **Daily updated Satellites maps**



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Thank You