Geo-enablement of Statistics in the 2020 round and beyond

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Outline

- Introduction
- The GIS-Based Census Operation
- The 5-year Rolling Program to Enhance the Digitized Census Maps
- Geotagging of Buildings
- The 2020 CPH Workflow using GIS Technology
- Beyond 2020, 5-year Rolling Program to Expand Application of GIS-based Technology
- Ways Forward

Introduction

Census of Population and Housing (CPH)

Census of Agriculture and Fisheries (CAF)

Census of Philippine Business and Industry (CPBI)

Introduction

Computer-assisted personal interviewing (CAPI)

- **2015 Global Adult Tobacco Survey**
- **Survey on Retail Prices for the Generation of CPI and other Price Indices**
- **Labor Force Survey (LFS)**
- **2017 National Demographic and Health Surveys (NDHS)**
- **2017 Listing of Farm Households (LFH)**

Introduction

Geographic Information System (GIS)

- value of location or the application of "science of where"
- In 2016, the Environmental Systems Research Institute (ESRI) introduced the potential applications of modern GIS platform in the statistical business processes
- integration of statistical and geospatial information

esri
THE SCIENCE OF WHERE™

Introduction

Map-Based Census Operation Using Modern GIS Platform

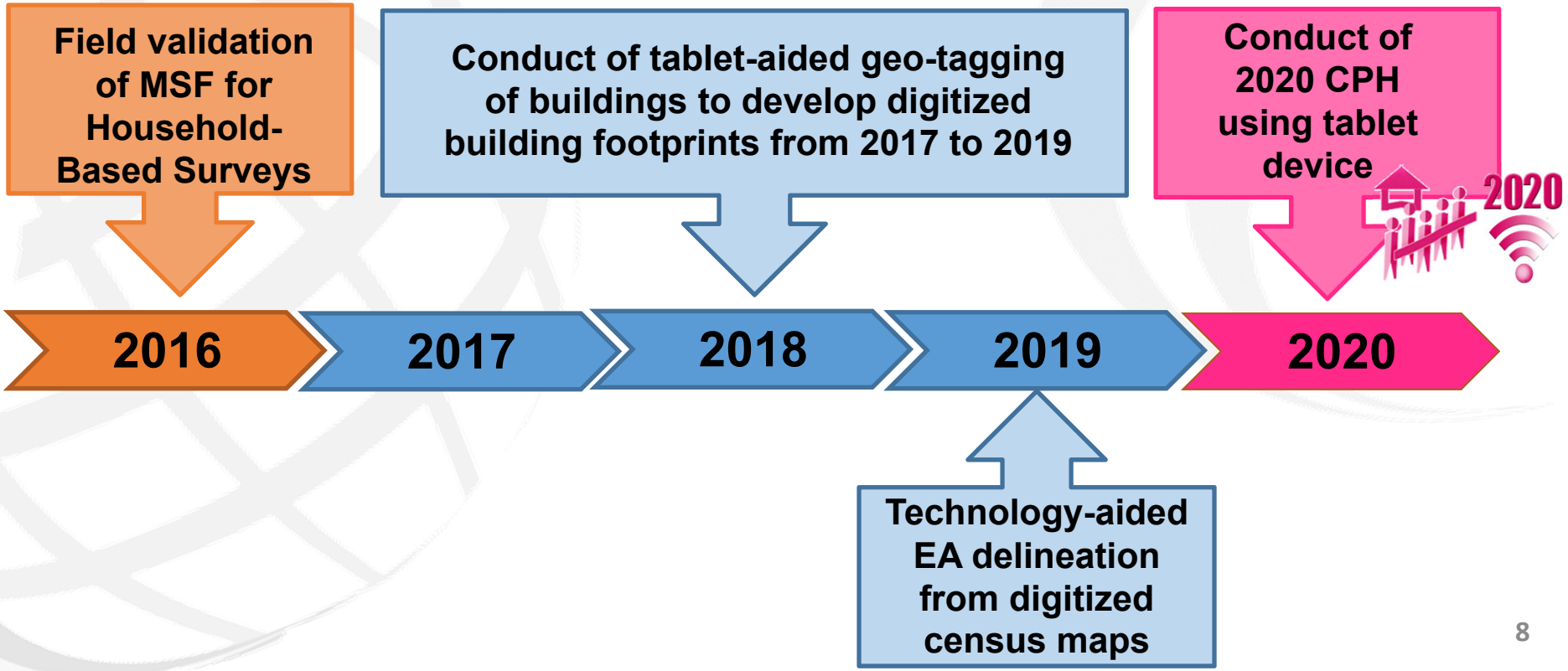
- introduce map-based or location-based conduct of census operations and to explore the possibility of integrating statistical and geospatial information
- application of GIS-based platform in the conduct of the 2020 Census
- methods and procedures in implementing the conduct of map-based census operation intended specifically for the future conduct of PSA censuses
- Other GIS-based platform initiatives that can be explored Beyond 2020

The GIS-Based Census Operations

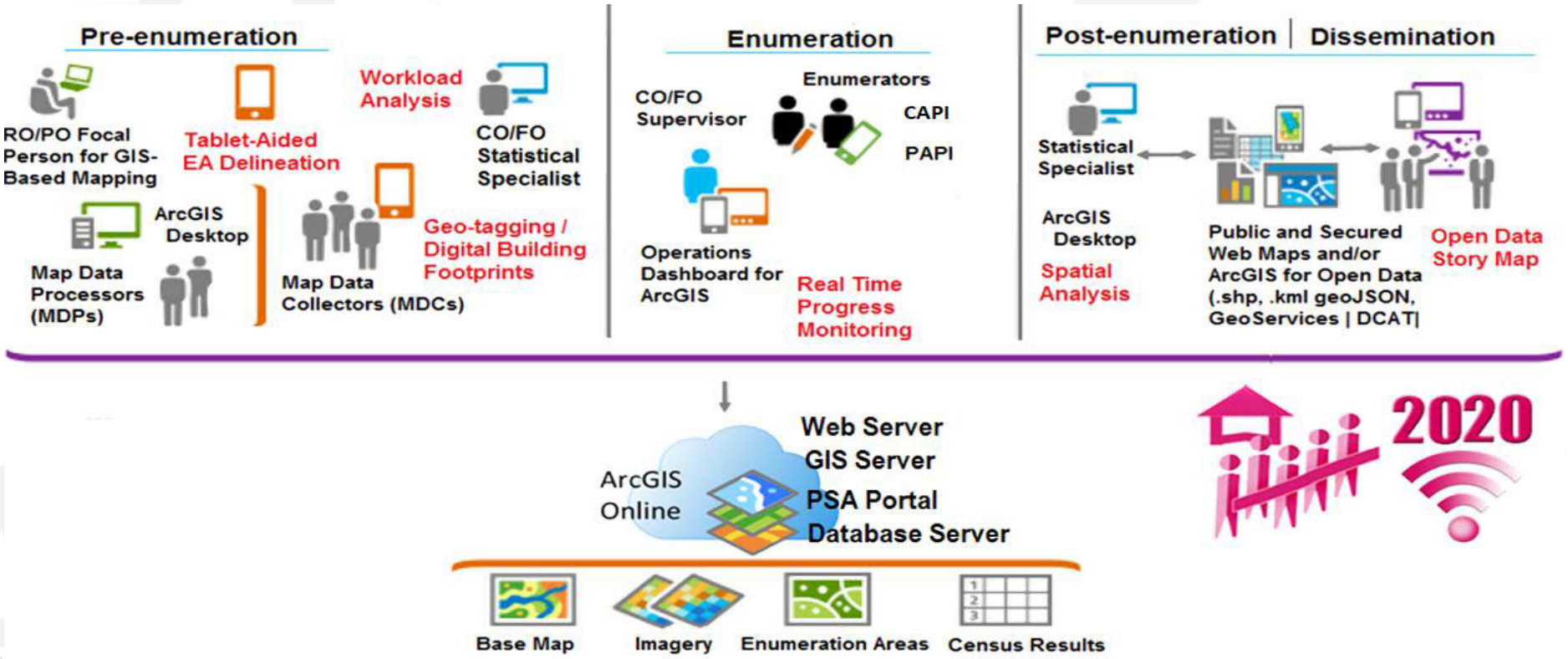
- ✓ **Availability of digitized census maps**
  - ✓ **On-going conduct of geo-tagging of building structures nationwide**

Generation of geodatabase that contains both geospatial information (*i.e., x, y coordinates*) and census data

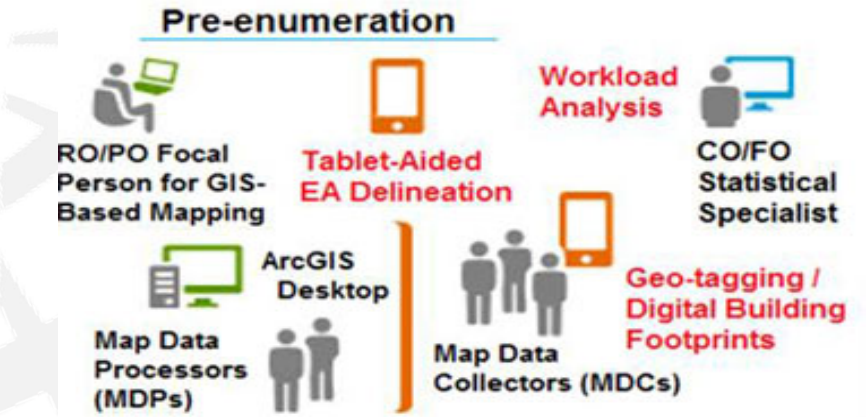
The 5-year Rolling Program to Enhance the Digitized Census Maps

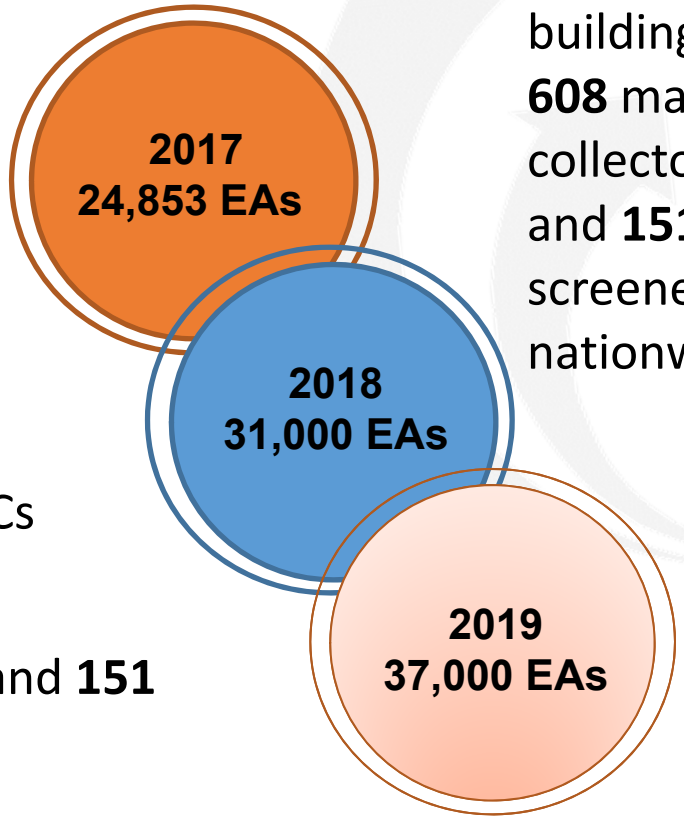


The 2020 CPH Workflow using GIS Technology



Geo-tagging of Building Structures



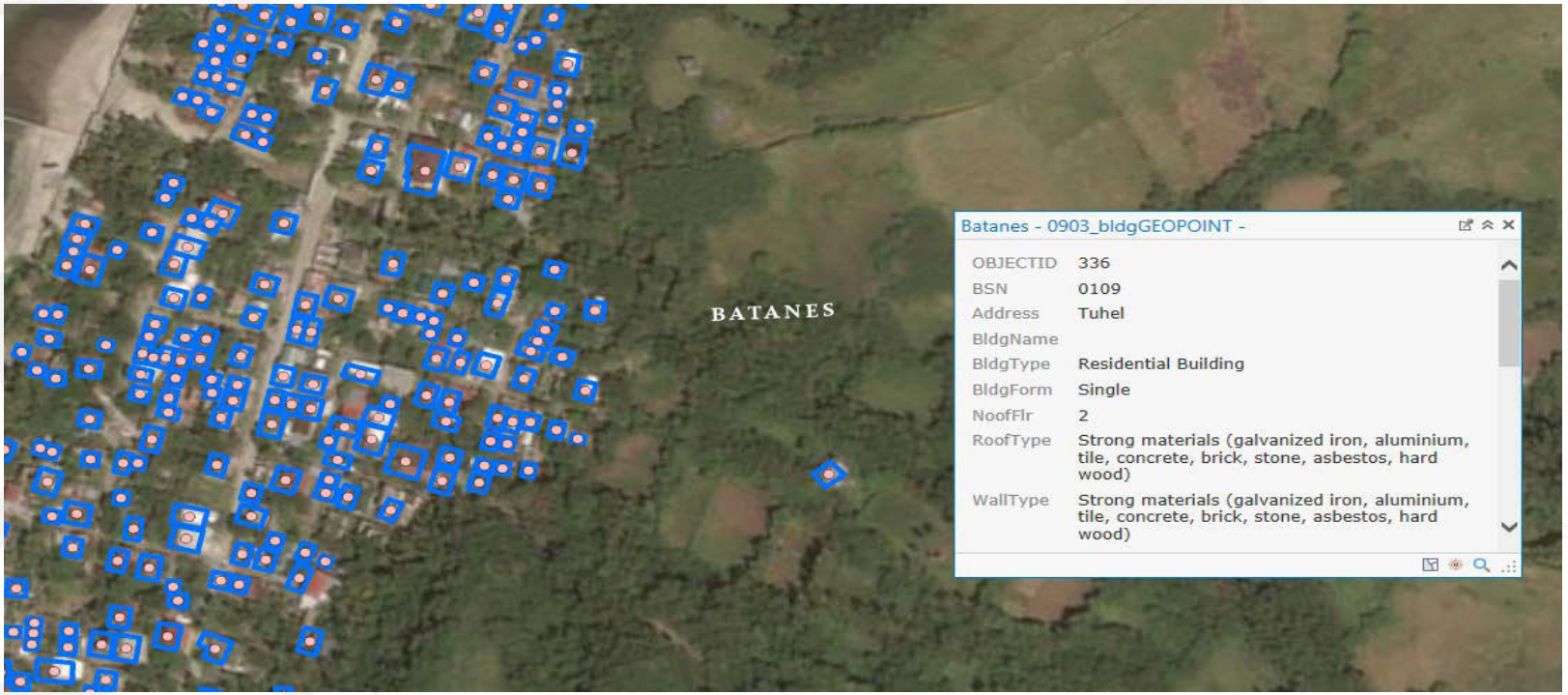


The 2017 geo-tagging of buildings hired **608** map data collectors (MDC) and **151** map data screeners (MDS) nationwide

In 2018 geo-tagging, a total of **606** MDCs and **146** MDSs were hired

For 2019 geo-tagging, **1,568** MDCs and **151** MDSs nationwide will be involved

Geo-tagging of Building Structures



Geo-tagged buildings in Barangay Tuhel (Poblacion), Ivana, Batanes

Geo-tagging of Building Structures

Density-Based Clustering of geo-tagged buildings in Basco, Batanes

Beyond 2020 Geotagging

- ✓ Beyond 2020, the geo-tagged points and digital building footprints can be used to develop a map-based sampling frame or geo-enabled master sample frame (GMSF)
- ✓ With the geo-enabled master sample frame, the drawn sample housing units can be easily identified from the map. The digitized enumeration area maps will be loaded in the CAPI system for map-based sample surveys.
- ✓ There will be regular conduct of geo-tagging activity in the Field Offices after 2020. This will facilitate detection of built areas as the map data collectors capture new buildings.

Tablet-aided EA Delineation

Parameters

1) **measure of size of about 300 households**

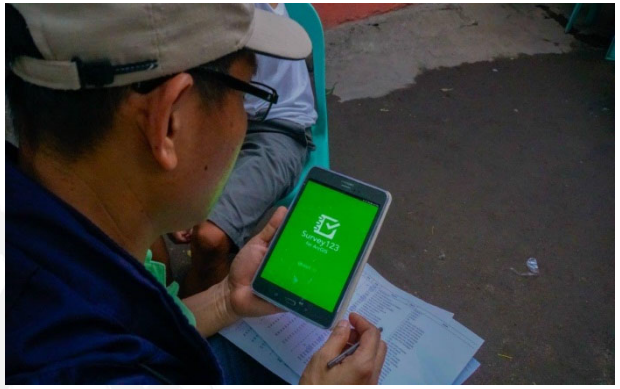
2) **accessibility within the area segment**

3) **conform with known administrative boundary, for example, barangay, city/municipality and, province boundaries.**

2020 CPH Workflow

HSN 001 - 005
HSN 026 - 030
HSN 051 - 055

20% Sample Assignment for CPH Form3 (long form) based on the clusters of HSNs



Map-based Listing and Enumeration Operation

Survey123 for ArcGIS

Synchronization/ Uploading of Interview Cases

Operations Dashboard for ArcGIS

Supervisors

ArcGIS Portal Server

Data Processing / Data Conversion

CSV

CSV Data File

STATA

Census and Survey Processing System

Use Lookup (External) Files

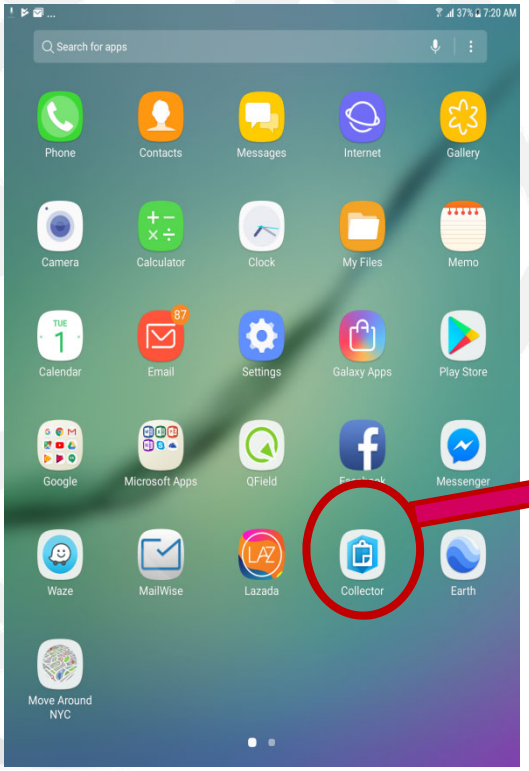
Conversion to other Data File Format for Statistical Tabulation

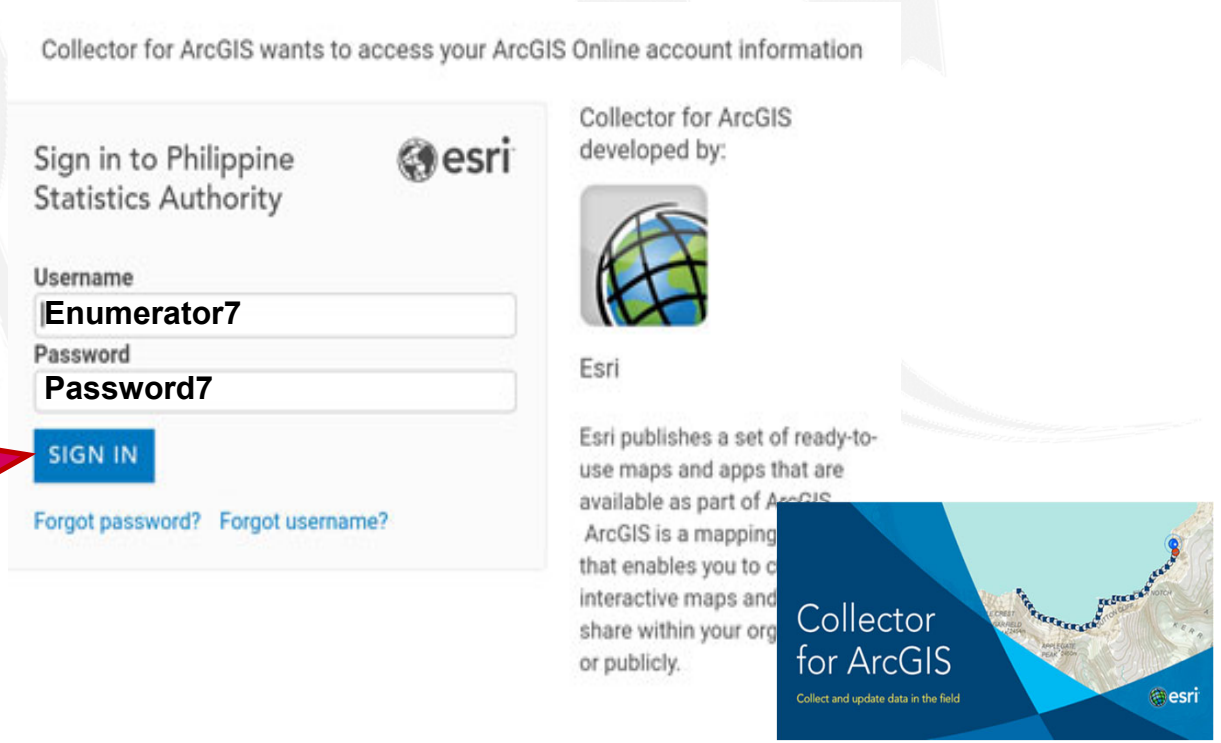
Data Preparation for Analysis and Dissemination

2020 CPH Workflow

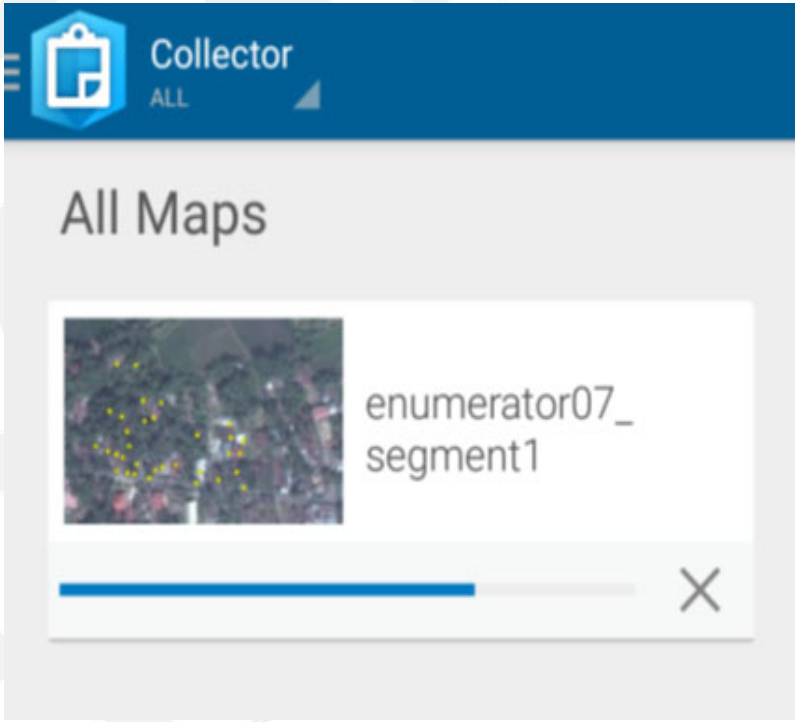
Map-based Listing and Enumeration Operation

Step 1: Open Collector for ArcGIS and Sign in using the provided Username and Password (Requires Internet Connection)

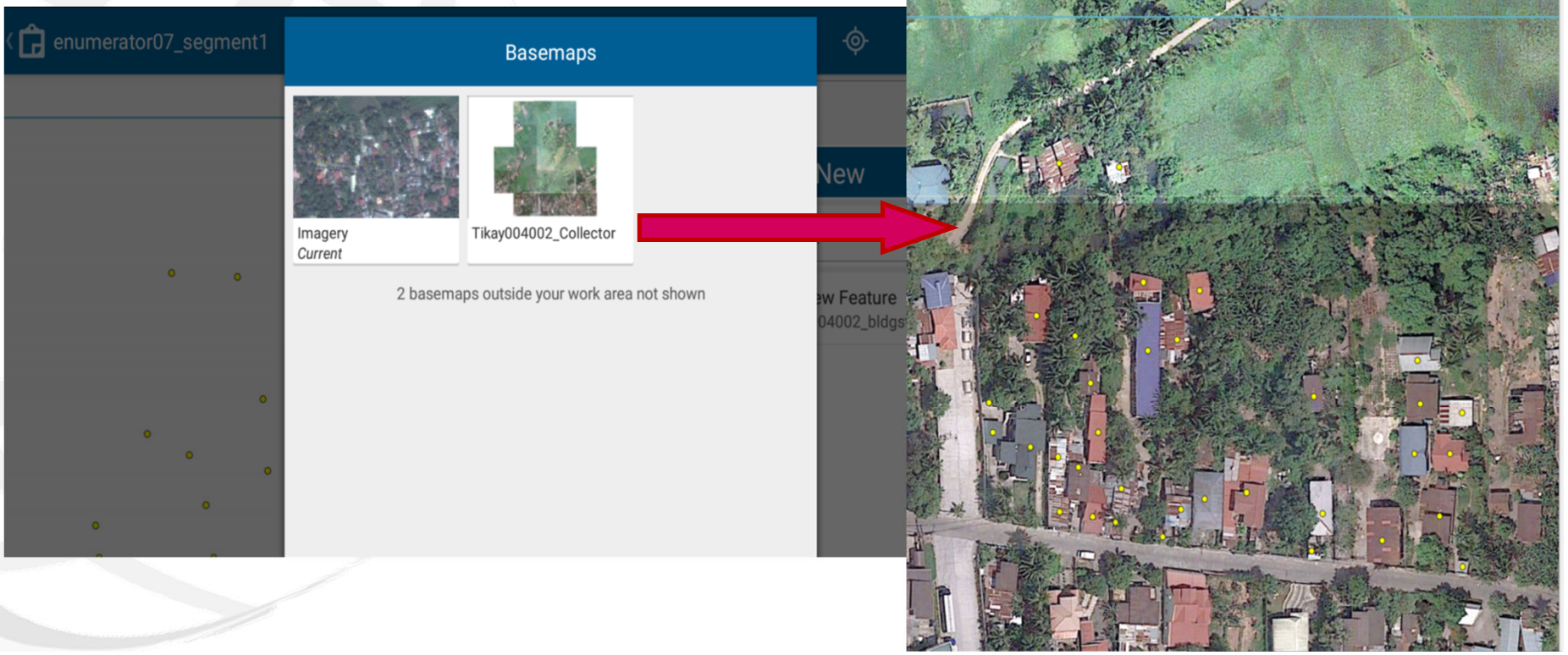




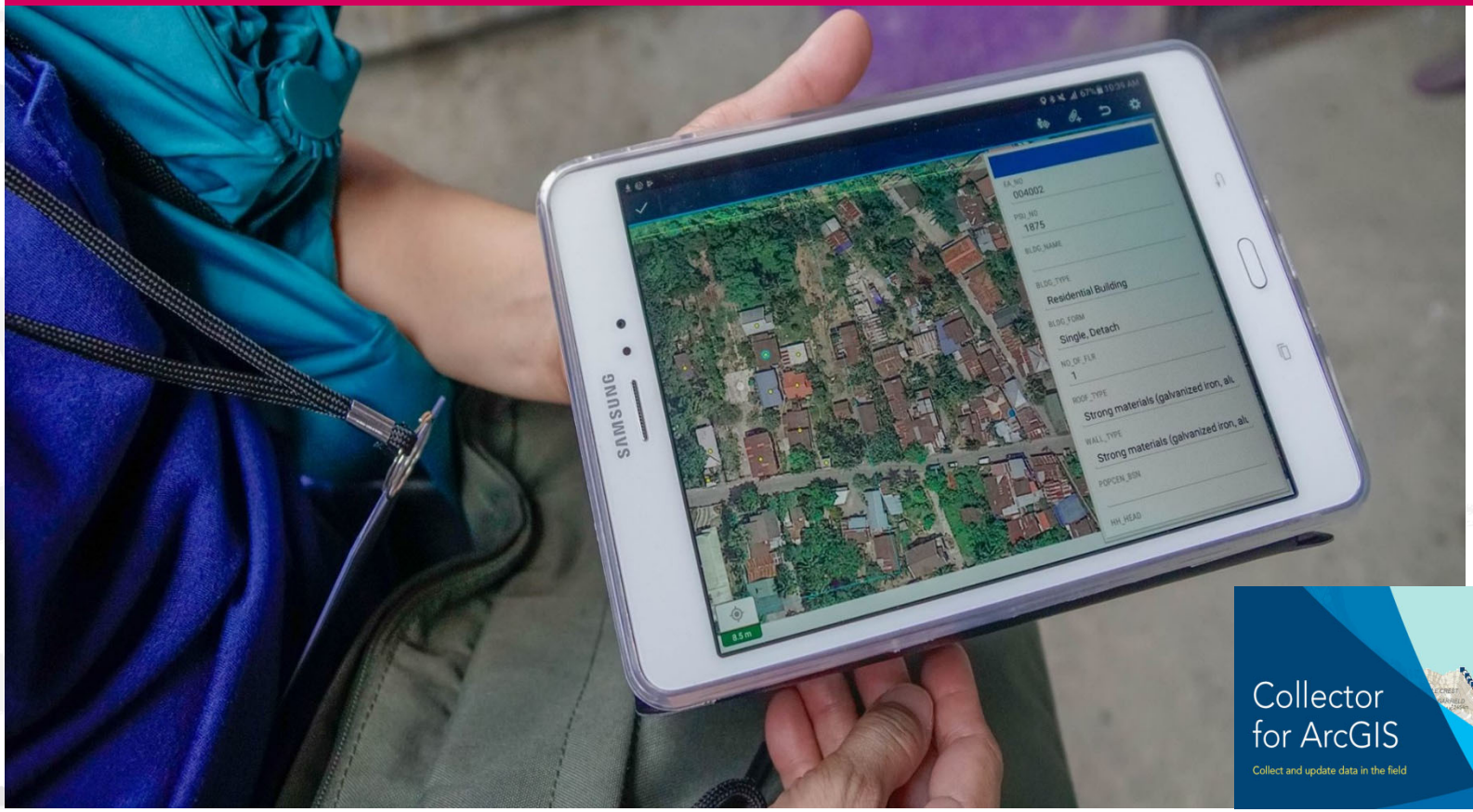
Step 2: Download (*one-time download*) from the server the assigned Enumeration Area (EA) web map with layers of EA boundary (polygon), road network (line), and the Geo-tagged buildings (geo-points) (**Requires Internet Connection**)



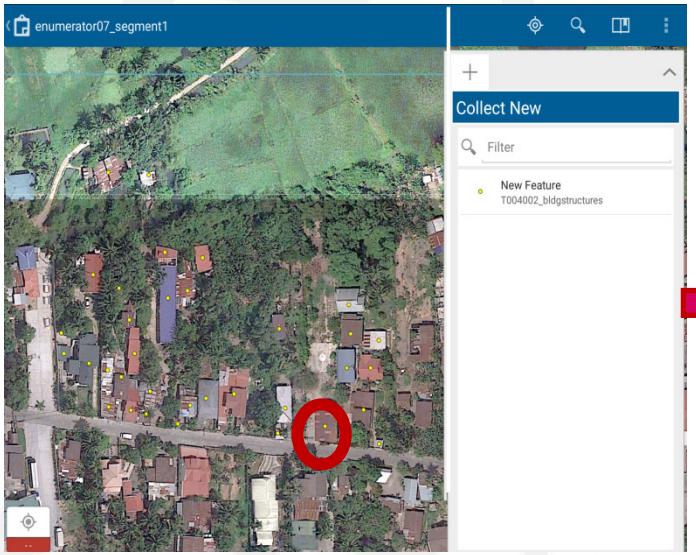
Step 3: Use the corresponding TPK (tile package) file created for the EA as the basemap. The TPK file contains the raster images of the assigned EA the can be used during offline data collection

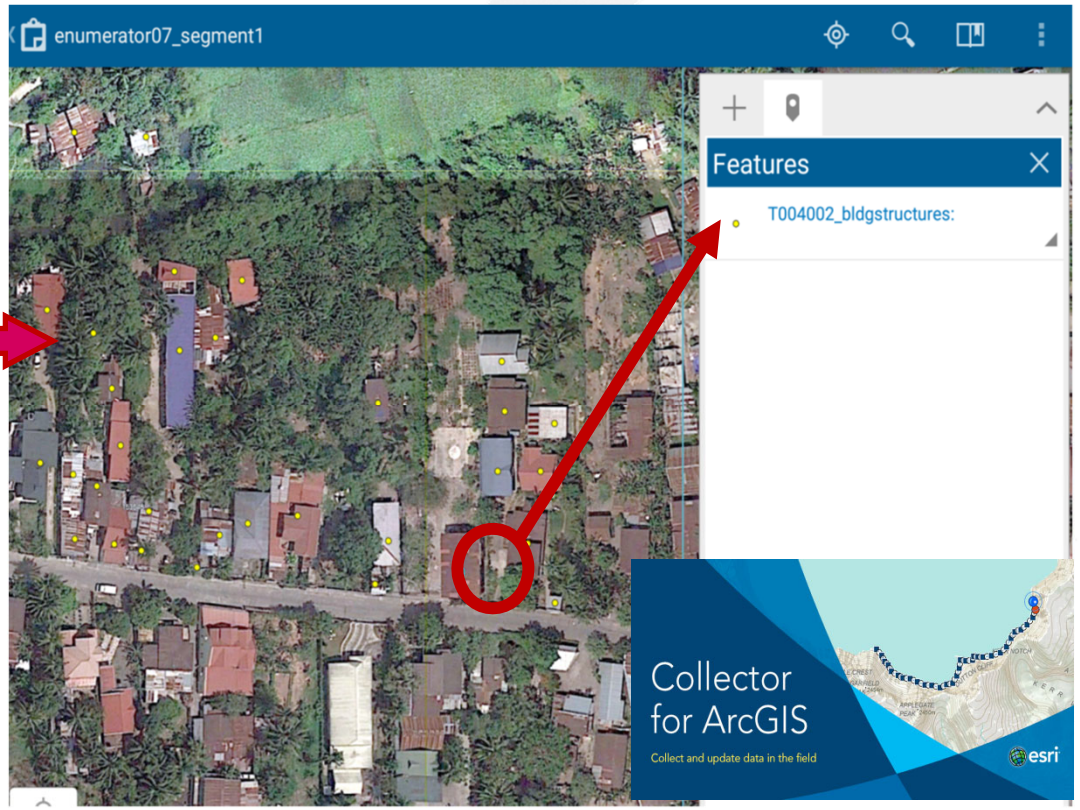


Step 4: Examine the assigned EA features relative to the actual position and proper map orientation to determine the starting point (*first building to be listed*)

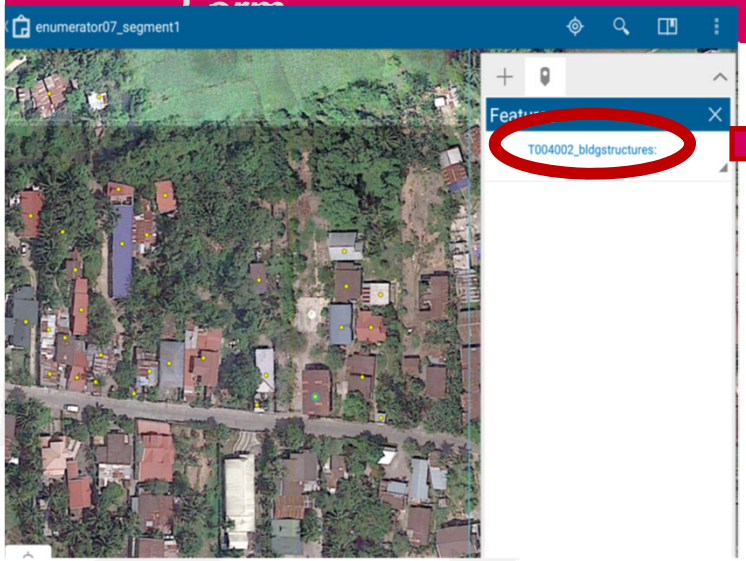


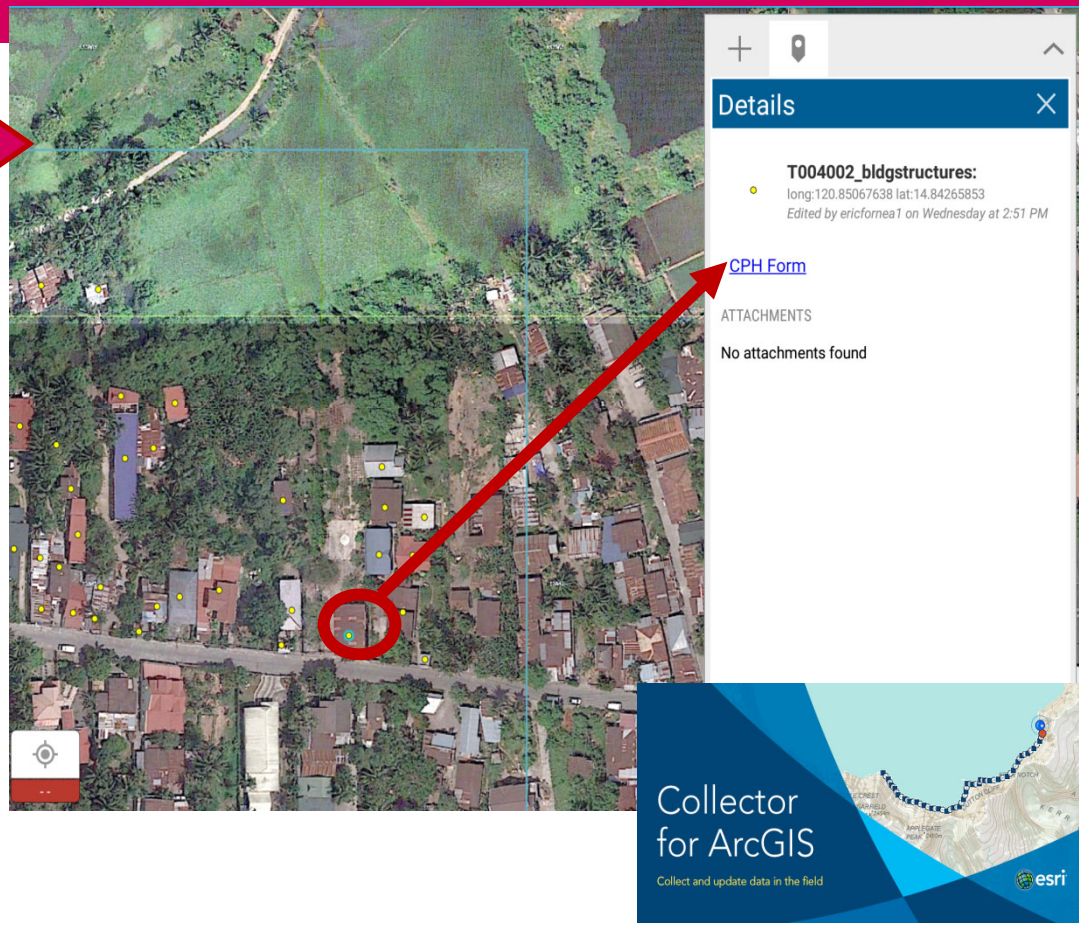
Step 5: Tap one Geo-tagged residential building (starting geo-point) to activate the dialog box containing the geo-point feature



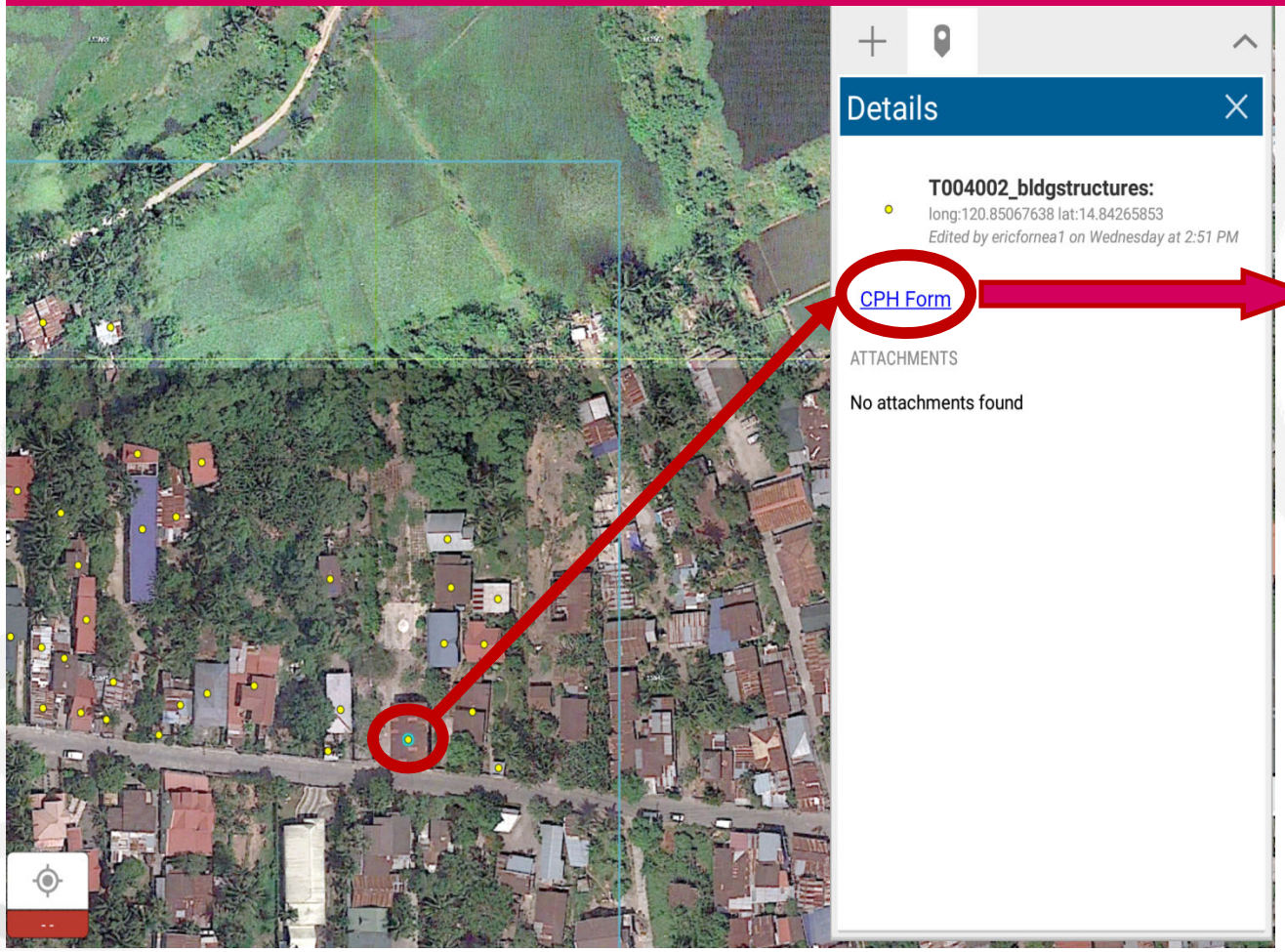


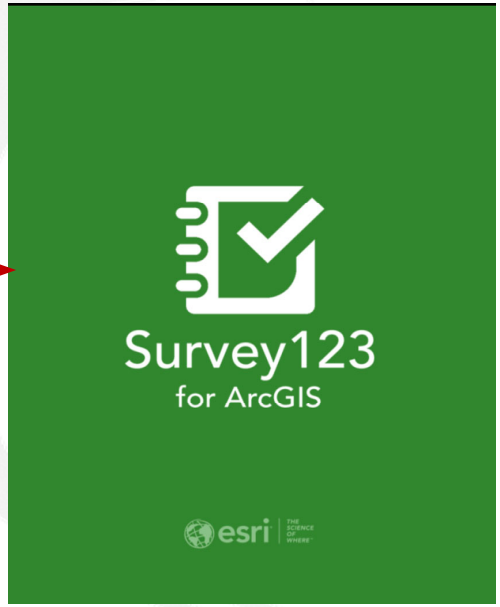
Step 6: Tap the geo-point feature link to load the dialog box containing the link to CPH Form



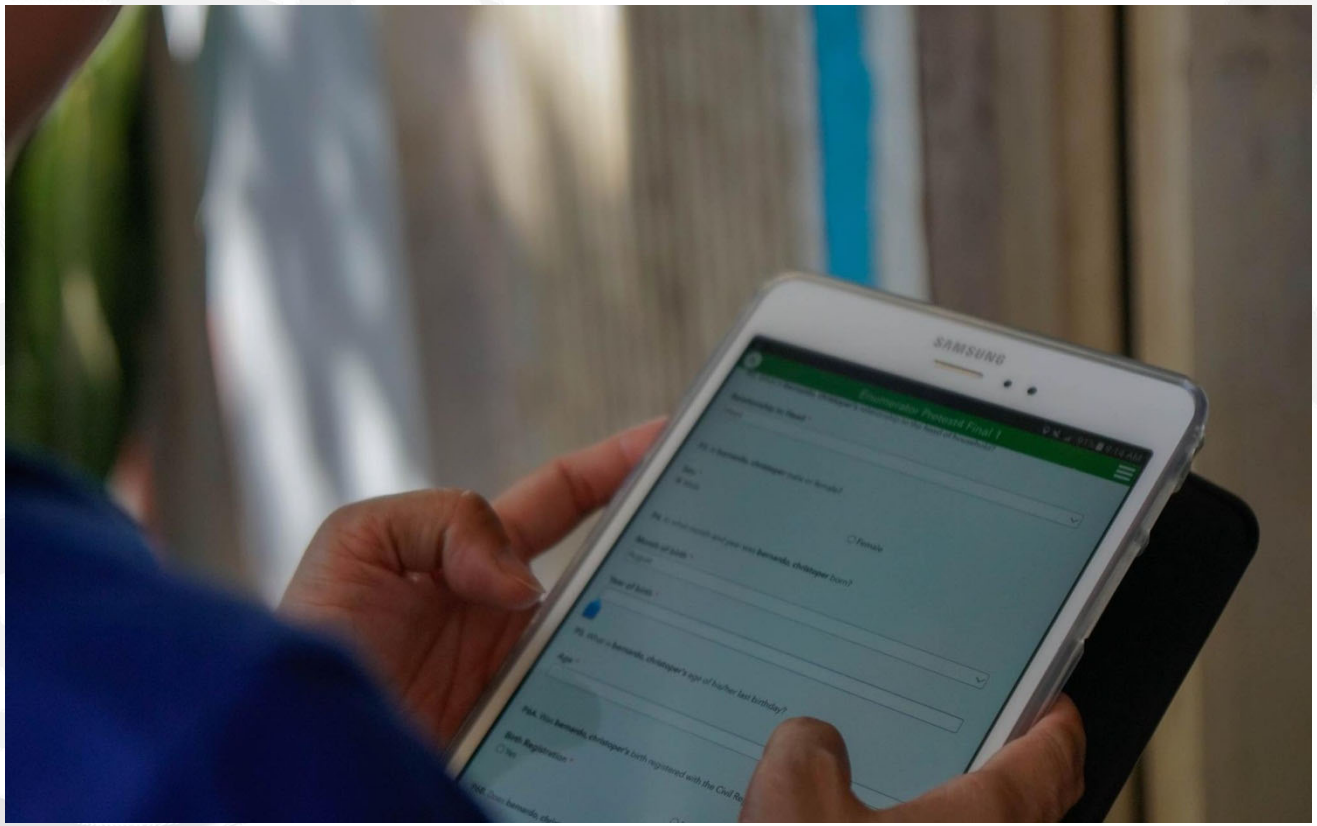


Step 7: Tap the CPH Form Link to Load Survey 123 for ArcGIS





Step 8: Start the Interview

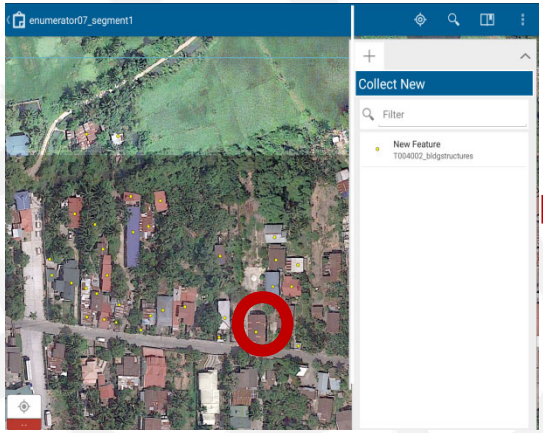


Survey123
for ArcGIS
esri

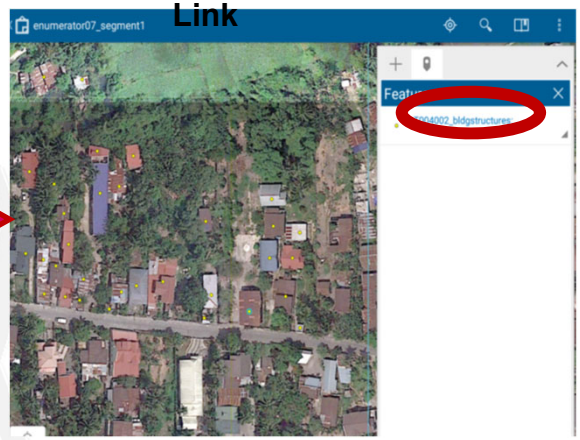
Step 9: End the Interview / Submit Forms to the Server (requires internet connection)

Step 10: Repeat Step 5 to Step 9

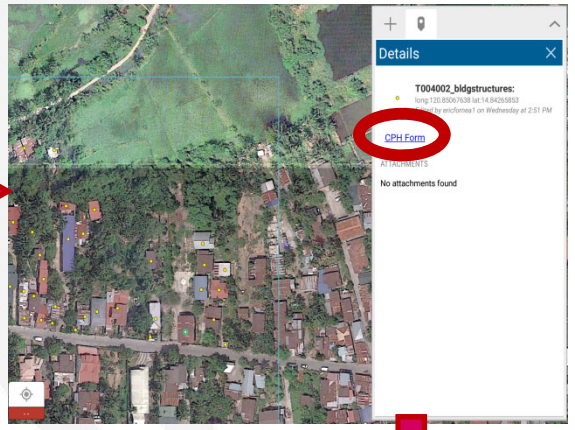
Step 5 Tap the building to activate the geo-point feature link



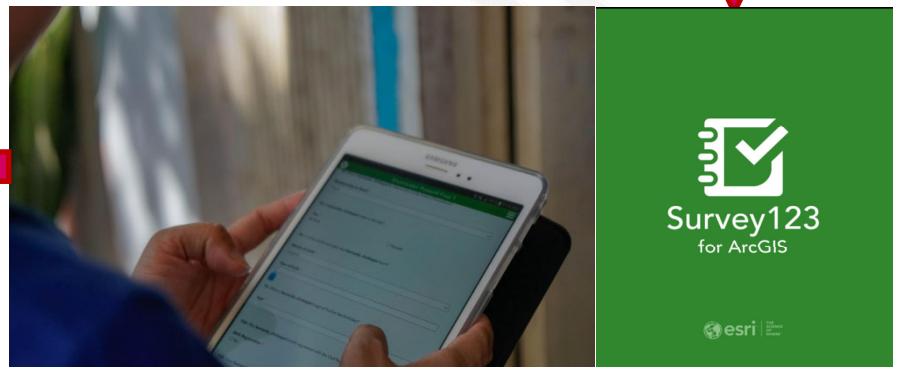
Step 6 Tap the geo-point feature link to load the CPH Form Link



Step 7 Tap the CPH Form Link to load survey 123



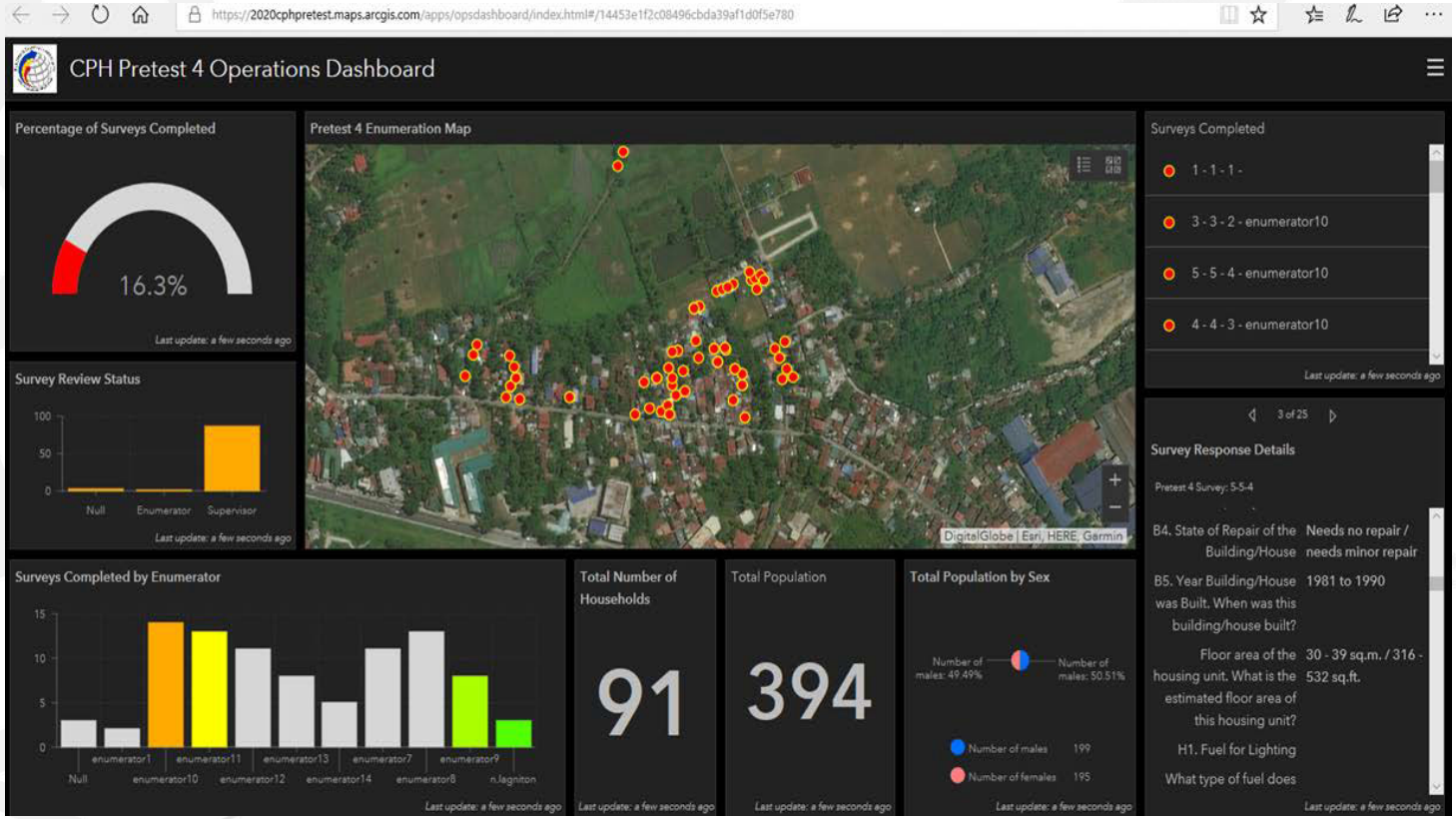
Step 8 Start the interview using Survey 123



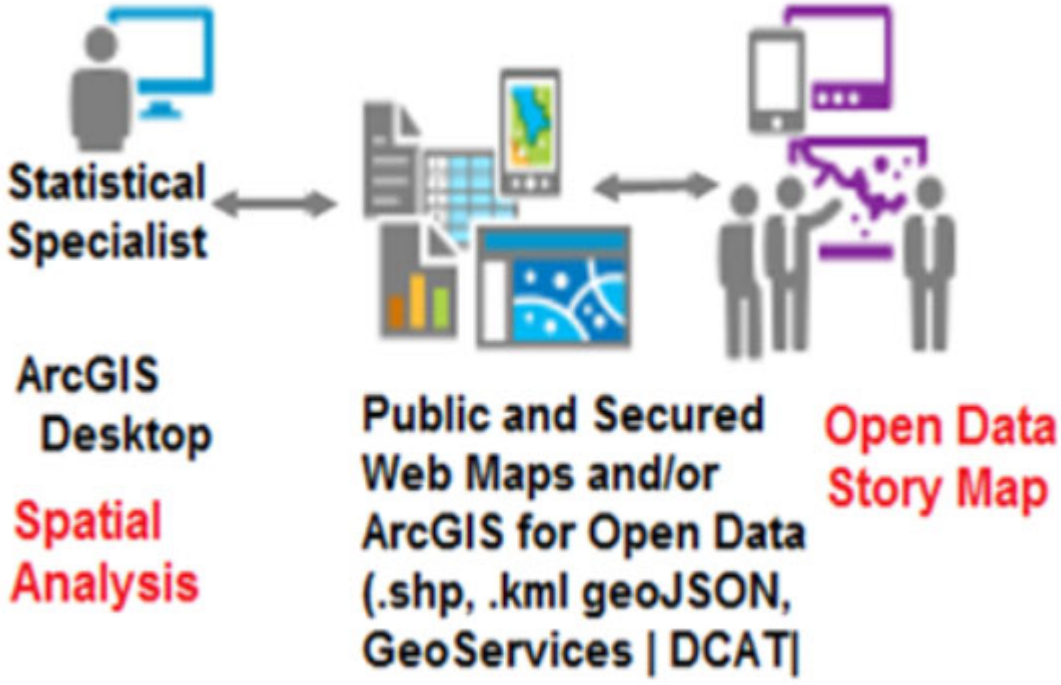
Step 9 End the interview / Submit Completed Forms to Server

Repeat the process until all enumeration units *(Building, Housing Unit, Household, Person)* within the assigned EA are completely covered

GIS-based Operations Dashboard

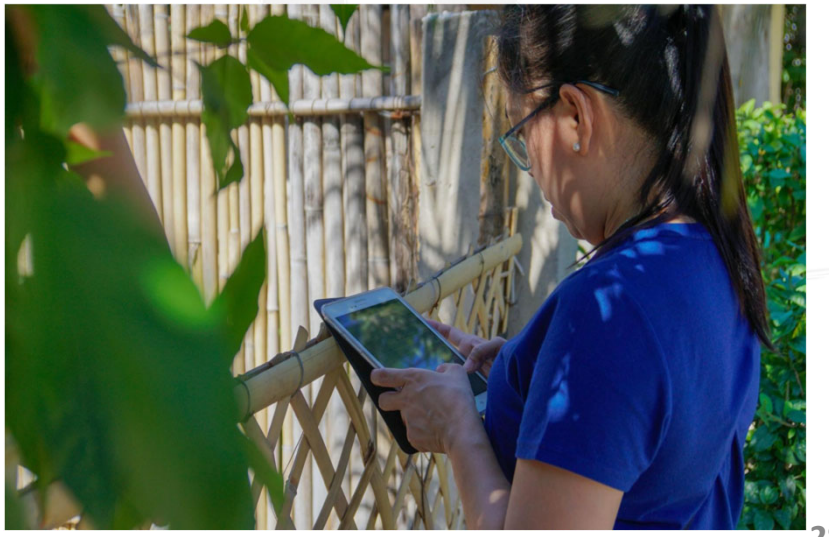


Post-Enumeration/Dissemination



Conduct of pretesting for the map-based census

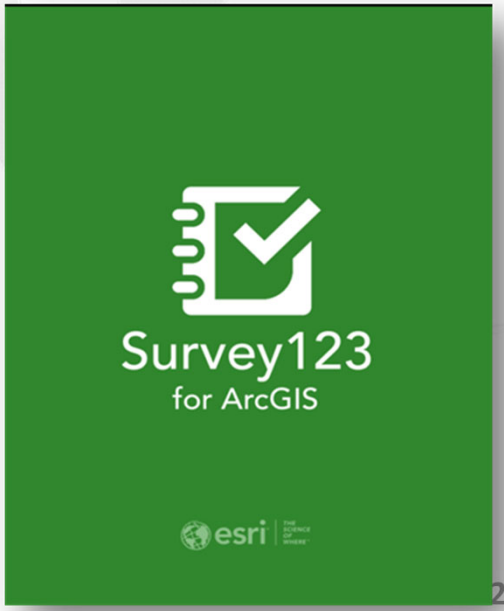
- Pretest 1: *Manila* and *San Juan* (September 2017)
- Pretest 2: *Palawan* and *Guimaras* (October 2017)
- Pretest 3: *Pampanga* (November 2017)
- Pretest 4: *Bulacan* (April 2018)
- Pretest 5: *Batangas* (June 2018)
- Mini Pilot Census:
  Janiuay, Iloilo (October 2018)



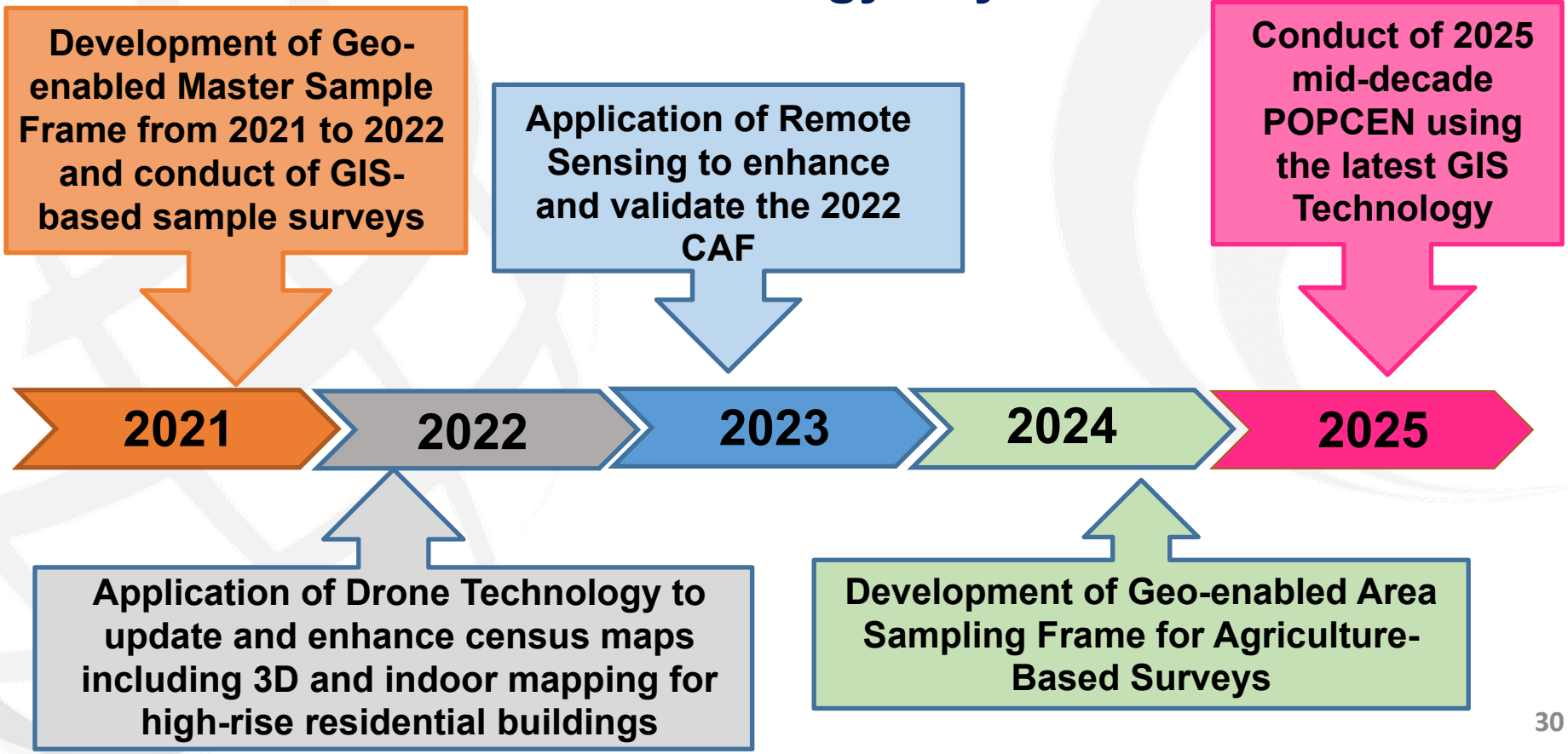
The Survey 123 Beyond 2020

- ✓ Beyond 2020, the survey 123, with substantial improvement from the 2020 census experience, will be more than sufficient for use by the PSA to explore and consider a map-based sample surveys using CAPI platform

- ✓ With the required infrastructures in place to support the GIS technology, and with the PSA's willingness to invest a long-term subscription in GIS softwares, The Survey 123, will always be there to compete with similarly known CAPI platforms like Survey Solutions and CSPro for tablet.



5-year Rolling Program to Expand Application of GIS-based Technology Beyond 2020



Ways Forward

1. To embrace innovative and transformative solutions through full implementation of GIS Technology, the GIS Enterprise, and the enhanced GIS-based Survey Apps, Map Data Collector Apps, and GIS-based monitoring dashboard as the front end of tablet-aided data collection.

Ways Forward

2. To consider a long-term investment in GIS technology that can be fully applied in our statistical business processes.

3. To have a continuing capacity development plan of PSA Personnel by conducting a series of GIS trainings, developing GIS-based projects, and participating in local and international fora/ meeting concerning GIS technology development.

Acknowledgements

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  Geospatial Mapping Unit, SOID, PSA
- **Mark Anden**
  Geospatial Mapping Unit , SOID, PSA

Thank You!

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