Household Tracking

Optimizing operations – where do we need to follow-up?

# background

The household tracking system is a way to map which households have been visited, which households have been missed, and which households need follow up. It enables targeted follow-up with each household and provides visibility into the progress of their work.

# reference/s

* Benin used this model (applied in ArcGIS Pro and published data in ArcGIS Online) in their Digitized LLIN Campaigns for a nationwide bed net distribution over 16 days, including 6,350 staffers who reached more than 13.5 million people living in 3,474,545 households. To learn more about this project, consider reading these two blog posts:
  + [**Digitization of Insecticide-Treated Net Distribution in Benin: Adapting to COVID-19 at Scale Through Digital Mapping**](https://bit.ly/2H8zTGI)
  + [**Full coverage: Bed nets for Benin**](https://gatesnot.es/31XCpWM)
* ​​​​​​​The same model (applied in Power BI) was also used to track anti-malarial medications for children in the Benin SMC project. This enabled staff to follow up with specific households and know where they needed to go to complete the doses.

# methodology

## requirements

* ArcGIS Pro License - request through [ServiceNow Form](https://crsprod.service-now.com/ess_portal/com.glideapp.servicecatalog_cat_item_view.do?v=1&sysparm_id=40ae17fc1be32410c66b8730604bcb8d&sysparm_link_parent=578a0c00db1bd700bb3f400e0b9619d7&sysparm_catalog=e0d08b13c3330100c8b837659bba8fb4&sysparm_catalog_view=catalog_default)
* Geographic Area of Interest in GIS shapefile format
* Building Polygons
  + Sub-Saharan Africa countries can request through the Ecopia platform. Fill out an [ICT4D Services Support Request Form](http://bit.ly/2CUNGLZ) to get support to request building dataset.
* Satellite Imagery – for base map reference of data
* Geographic locations (GPS points) of Household – make sure to set your accuracy less than 15 meters or less
  + CommCare: [Automatic GPS Capture](https://confluence.dimagi.com/display/commcarepublic/Automatic+GPS+Capture) to activate GPS data collection.
  + RedRose: contact your Regional ICT4D Solutions Engineer or Red Rose representative

## technical process

Requirements Checklist

* Area of Interest (.shp)
* Building Polygons (.shp)
* Satellite Imagery (raster or basemap)
* HH GPS Locations (.shp)

### ARCGIS PRO

* Graphical user interface, application

  Description automatically generatedDownload the Toolbox model here: https://bit.ly/HHTracking
* Open ArcGIS Pro and add the download Toolbox model through the catalog pane.
* Graphical user interface, application

  Description automatically generatedThe new toolbox named Benin LLIN Model will be added with 2 models named (1) Registration Model and (2) Redemption Model. Registration Model shall be used for the 1st visit and the Redemption model is used for 2 or more succeeding visits.
* Right-click on the chosen model and select Open.
  + Add your input datasets
  + Add your Building Data
  + Add your Geodatabase to save your files
  + (OPTIONAL) Add your administrative level boundaries to create a count total per administrative boundary
* Click Run
* Publish your featured layer on your ArcGIS Online Dashboard and update when needed.

*Note: To activate automation, setup a Data Interoperability extension using ODataFeed for CommCare or JSON Endpoint for Red Rose to connect to ArcGIS Pro. Then setup scheduled run for the ArcGIS Pro Toolbox model. Please ask for* ***staff support from the Data and Geospatial Analytics Team****.*

Graphical user interface, application

Description automatically generated

### ARCGIS ONLINE (SERVER/PORTAL)

* Open ArcGIS Online Map (\*link to follow once ArcGIS Server is working properly\*)
* Input requested parameters/datasets
  + Add your GPS location data (merged data)
  + Add your Building Data
  + (OPTIONAL) Add your administrative level boundaries to create a count total per administrative boundary
* Click Run. Results can then be viewed in the online map or exported as an ArcGIS shapefile or Google Earth file (.kml/.kmz)
* Publish your featured layer on your ArcGIS Online Dashboard and update when needed.

## technical modifications

For customizations, download the Toolbox model here: <https://bit.ly/393J4mO> and instead of selecting Open select Edit to change parameters according to program needs. Sample modifications on the tool can be:

* + Administrative level boundary count
  + GPS location point buffer to building data
  + Removal of other building type (non-residential)

# planning

## technical costs

* Storage costs (costs are applied every storage hour)
  + $100 for every 4GB of **building data**(vector layer) stored on ArcGIS Online per month.
  + $100 for every 830GB of **high-resolution imagery** (raster layer) per month.

*For example, since Benin is 114,763 km2their building data is around 2.7 GB, which consumes 658.44 credits per month amounting to $65.84 cost per storage month.*

* Satellite imagery cost
  + Depends on availability and resolution. To know more check our [one-pager for Satellite Imagery](https://crsorg.sharepoint.com/sites/Knowledge-and-Innovation/SitePages/Satellite-Imagery.aspx).
* Staff Support
  + Data and Geospatial Analytics Team provides **Spatial Analytics** support with **no charge back** for work < 80 hours. Fill out an [**ICT4D Services Support Request Form**](http://bit.ly/2CUNGLZ)for us to discuss over a call.

## time frame

* Data Requirements
  + Building Polygons: 1 day (from OSM) to 1 week (from Ecopia or Maxar request)
  + Satellite Imagery: 1 to 2 weeks (upon request and availability)
  + Household GPS Locations: 1 day to 1 week (data preprocessing and cleaning by CP or Project Team)
* Data Setup in ArcGIS Pro: 1 to 3 days
* Data Setup in ArcGIS Online: 8 hours to 1 day
* Run Setup: 1 hour to 1 day (depends on building data and HH GPS size)