Disaggregating by Geographic Location: Developing further guidance for the SDGs Geospatial Roadmap

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Side Event Strengthening Statistical and Geospatial Integration – "the SDGs Geospatial Roadmap and the GSGF Implementation Guide"

SDG Data Disaggregation

- Disaggregation by sex and gender
- Age
- Income
- Disability
- Ethnicity and indigenous status
- Economic activity
- Migration status
- **Geographic location**

Sustainable Development Solutions Network, 2015. "Leave No One Behind: Disaggregated Indicators for SDGs"

	SDG 1				SDG 2				SDG 3					
Target number	1.1	1.2	1.3	1.b	2.1	2.2	2.3	3.1	3.2	3.3	3.5	3.7	3.8	3.a
Age		X	X	X	X	X			X	X	X	X		X
Sex		X	X			X	X	X	X		X			
Employment			X											
Poverty levels				X	X								X	
Disability			X											
Vulnerable population									X				X	
Indigenous status							X							
Rural/Urban	X													

Integrating geospatial and statistical data

GIS Data	Statistical attribute data
Points • GPS coordinates for dwelling units, settlements • GPS coordinates of physical infrastructure (health facilities, schools etc.) • Health facilities with address (street name, number)	• Types of buildings (residential, commercial, Government etc.) • Demographic and socioeconomic characteristics • Building/housing characteristics • Types of health facilities, service provided, number of bed, doctors, nurses, etc.
Lines • Transport networks, • Topography (rivers, terrain etc.)	• Types of roads, highway, paved, unpaved, Speed limit, U-turn limit, Road conditions • River types, e.g. streams, major rivers
Polygons/Areas • Administrative boundaries • Enumeration area boundaries	• Aggregated indicator data at admin levels • Aggregated indicator data at EA level

Census are collected at each individual and household level. Usually, these statistical data are integrated with GIS point (HH locations) or area data (Admin boundaries), so georeferenced census are generated and can be shown on map.

Geographic Disaggregation of Population Data

High resolution population basemap

- Visualizing population (by age and sex) distributions on smaller geographic areas - higher spatial resolution levels, e.g. women, girls, older persons, and explore the spatial distribution characteristics.
- Providing population numbers to monitor SDG, ICPD progress, allow the integration of population with other data for various development issues.

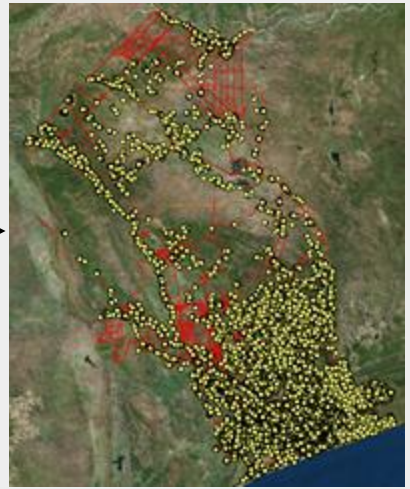
Geospatial Solution for the 2020 Census Round

GIS, GPS and Satellite Imagery in ensuring the coverage of household listing and quality of enumeration area boundary delineation

Point-Level (household level) Population Basemap

Using **GPS coordinate** to locate individual or HH

X	Y
33.658	-25.0606
33.658	-25.0828
33.658	-25.0528
33.658	-25.0514
33.658	-25.0765

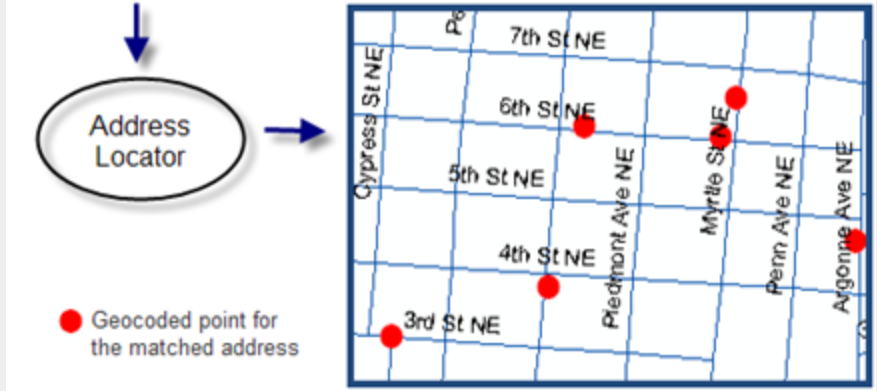


Mozambique household location (Gaza Province)

Combine point tabulated data with **address** and **GIS road** data using "geocode" locations

customers

NAME	ADDRESS	CITY	S
Ace Market	1171 PIEDMONT AVE NE	ATLANTA	G
Andrew's Gasoline	1670 W PEACHTREE ST NE	ATLANTA	
AP Supermarket	4505 BEVERLY RD NE		G
Atlanta Market	241 16TH ST NW	ATLANTA	G



Area-Level Population Basemap

Linking boundary with tabulated data to generate aggregated pop by area. The smallest area unit is enumeration area (EA) where census are collected, the smallest administrative levels are usually neighborhood, village, ward, or municipality

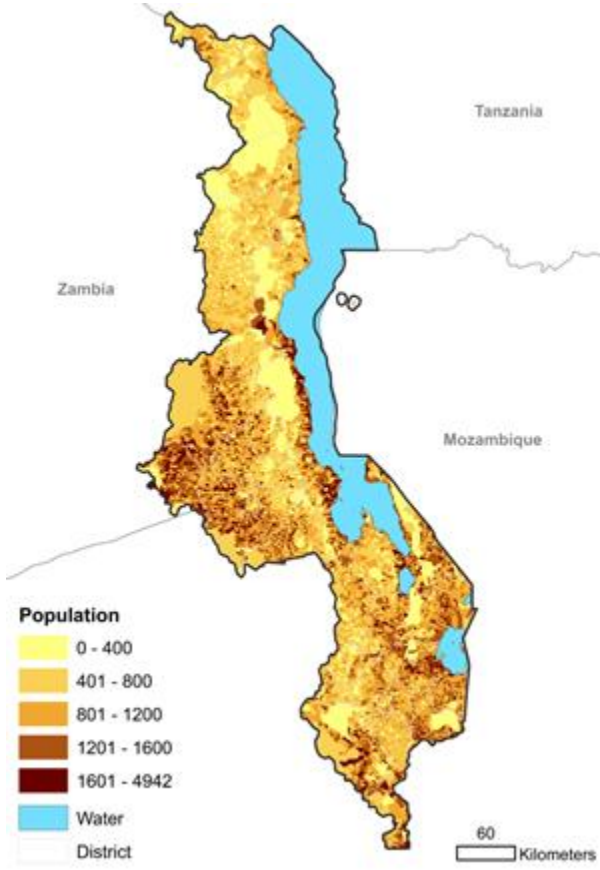
Table

Malawi_TA_2018

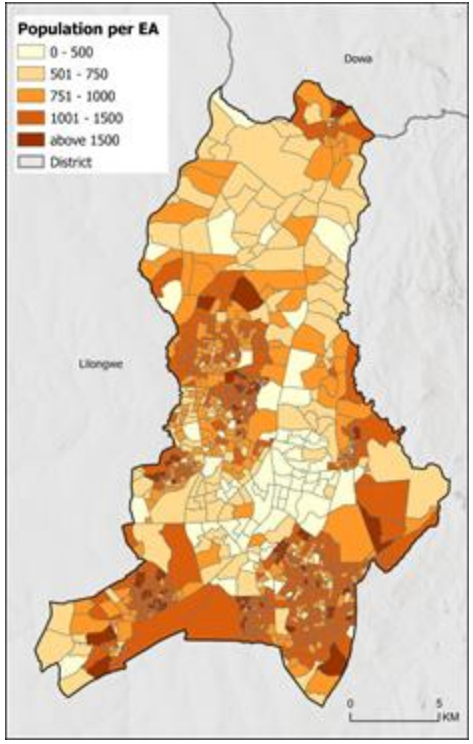
FID	Shape *	OBJECTID	REG_NAME	REG_CODE	DIST_NAME	TA_CODE	TA_NAME	TAcode	NO
0	Polygon	2	Central	2	Dedza	20820	Dedza Boma	20820	1
1	Polygon	3	Central	2	Dedza	20805	TA Chauma	20805	2
2	Polygon	4	Central	2	Dedza	20802	TA Chilikumwendo	20802	3
3	Polygon								
4	Polygon								
5	Polygon								
6	Polygon								
7	Polygon								
8	Polygon								
9	Polygon								

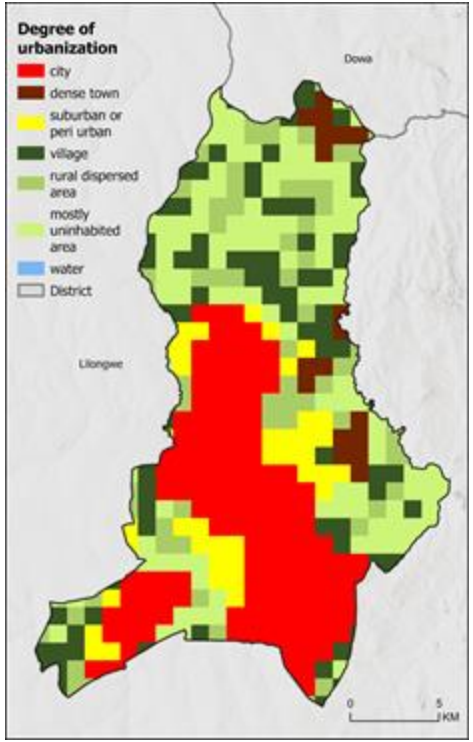
DIST_CODE	EA_NUMBER	EA_CODE	TA_CODE	TA_NAME
203	802	20307802	20307	TA Malenga
203	025	20307025	20307	TA Malenga
203	007	20307007	20307	TA Malenga
203	005	20307005	20307	TA Malenga
203	012	20307012	20307	TA Malenga
203	013	20307013	20307	TA Malenga

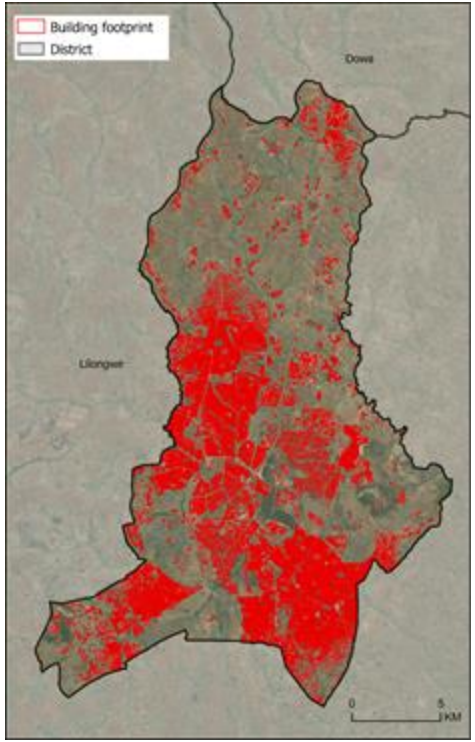
Malawi population at EA level

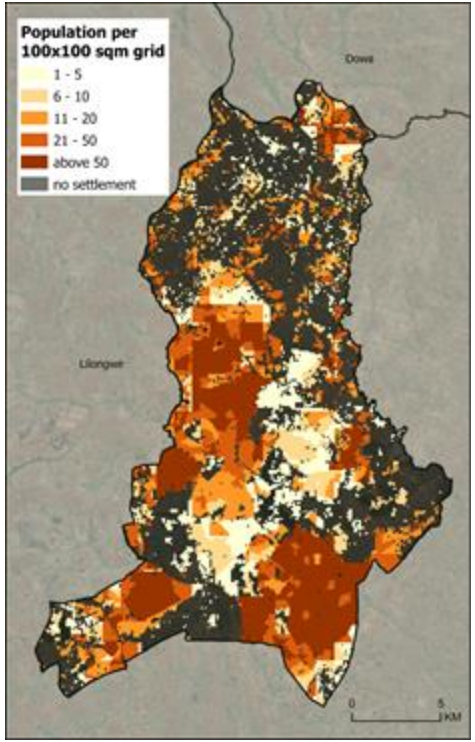


Integration of EA level population, building footprint, and other GIS data to estimate high-resolution population by 100mx100m grid







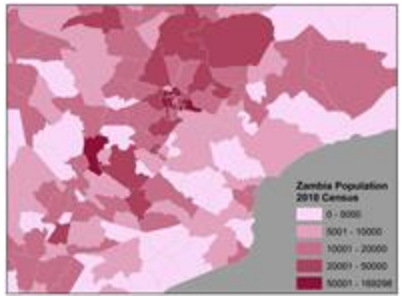


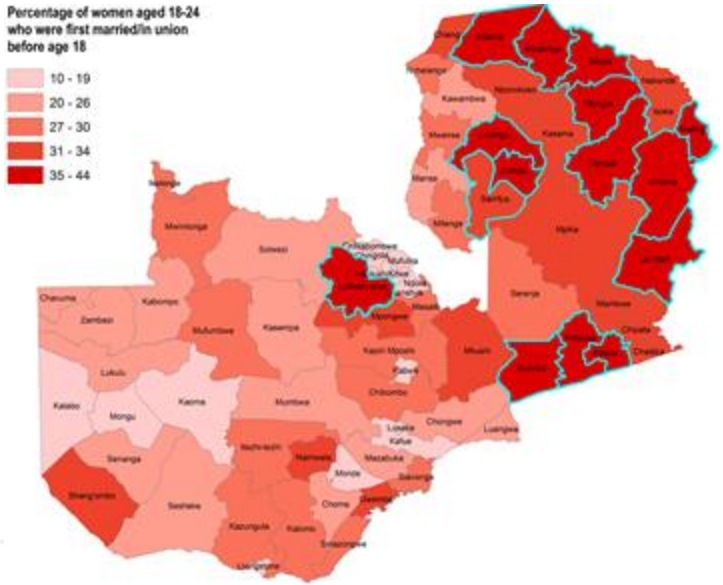
Geographic Disaggregation of SDG Indicators

- Enabling display of information on smaller geographic areas - Higher resolution thematic mapping e.g. numbers and percentages of child marriage
- Trend analysis for select geographic levels
- Enabling the integration of georeferenced census indicators with other geospatial data for various development issues, e.g. linking pregnant women with location of health services

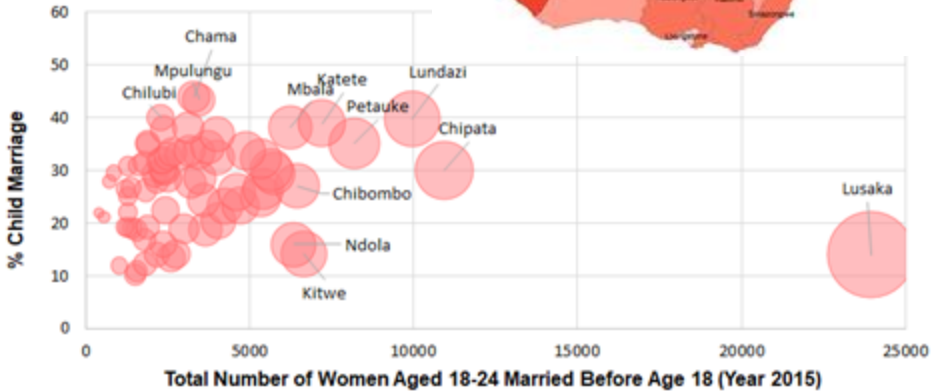
Subnational mapping of SDG indicators

Total population at Ward Level (Zambia Census 2010)

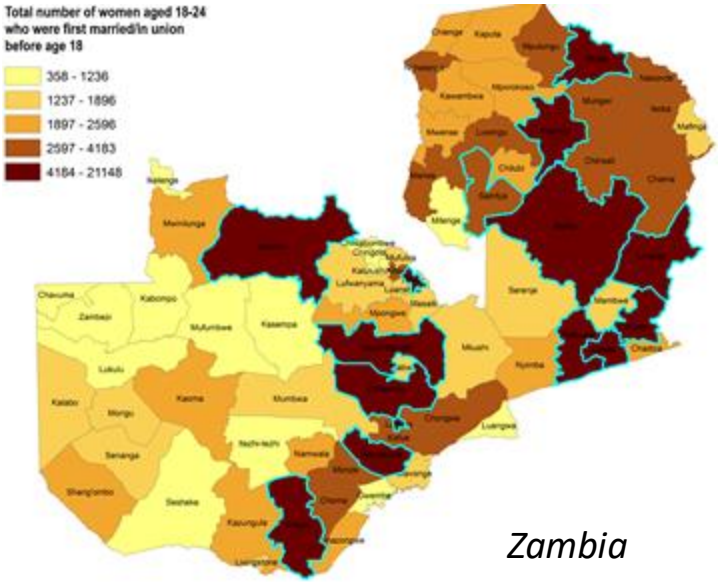




Child Marriage (Percentage)



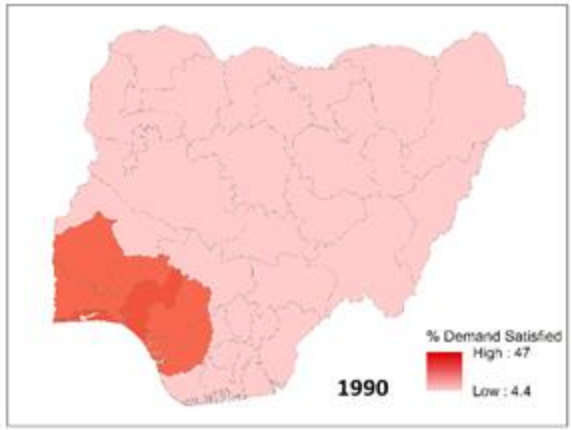
Child Marriage (Total Number)

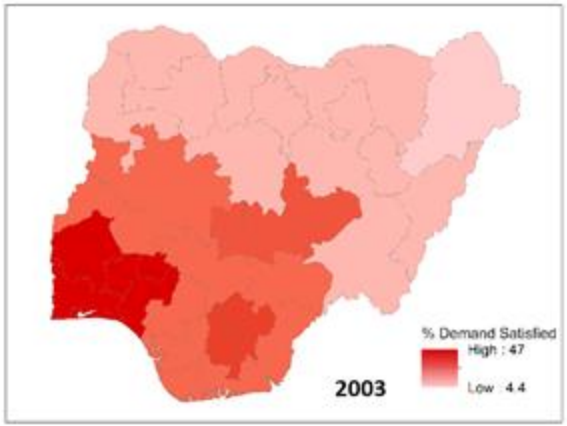


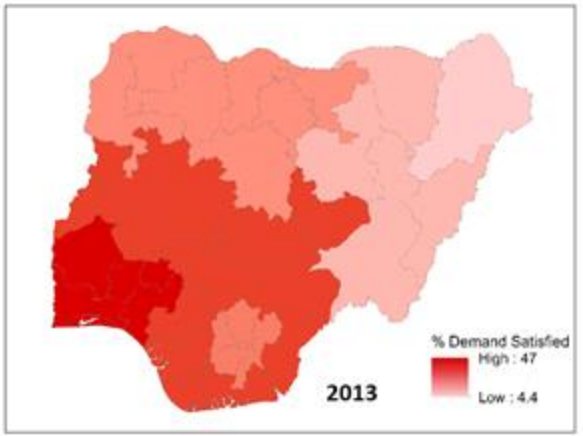
Zambia

Harmonizing Boundaries

Example of tracking Nigeria family planning indicator (% of demand satisfied for family planning) from 1990, 2003, to 2013, by harmoning boundaries, i.e. through converting area-based indicator to gridded data, and re-aggregating using 2013 boundaries.



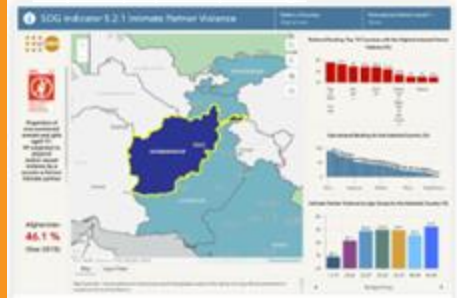




UNFPA Population Data Portal

+200 Population Indicators at Admin Level 0-2

https://pdp.unfpa.org/



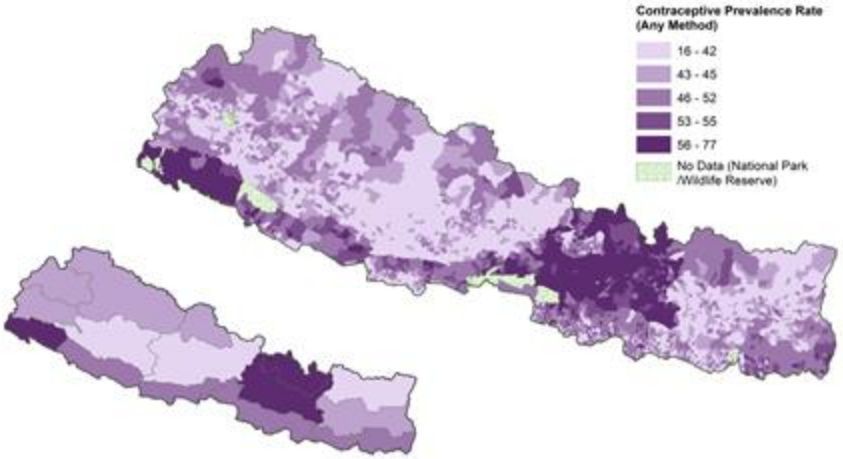
Small Area Estimation of SDG Indicators

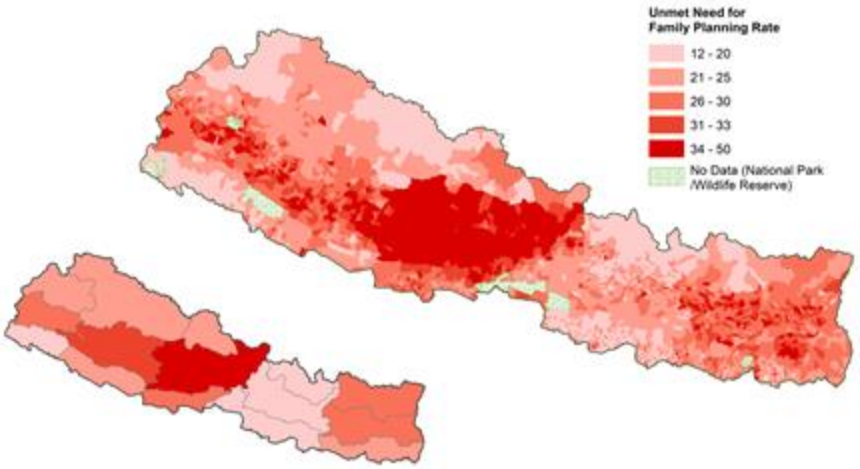
Linking census with survey and other data to estimate and map SDG indicators that are collected only via household surveys (e.g. DHS and MICS) at a small area level

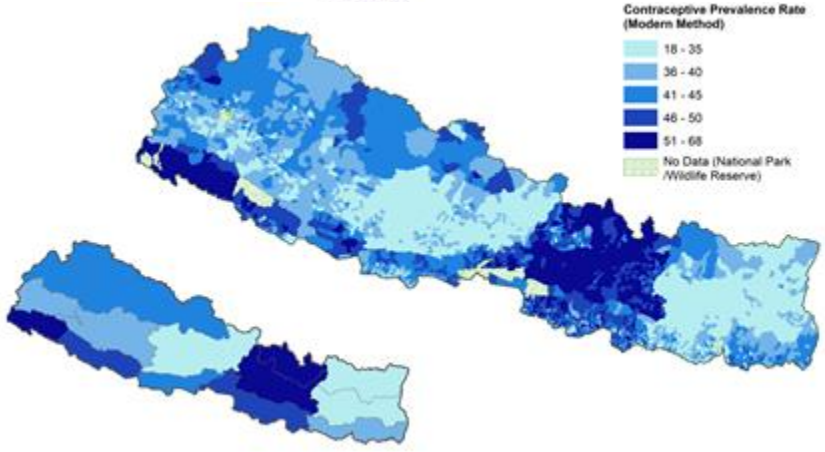
Main Steps:

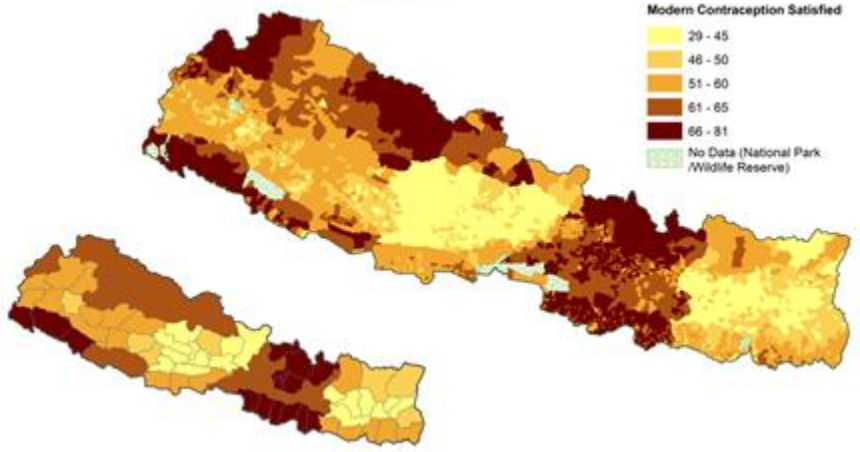
- Census and survey data assessment and harmonization
- Identify the best model based on survey data
- Apply the model to census data to predict individual-level estimates based on census data
- Aggregate the estimates from the individual-level to any level of geography (including small areas)

Small Area Estimation - example of family planning indicators in Nepal



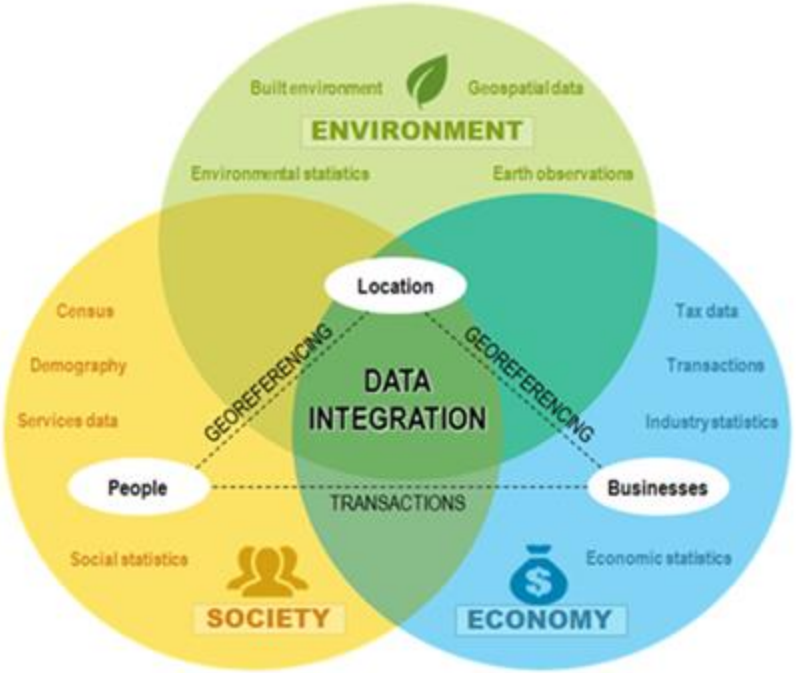






Integrating georeferenced population with other geospatial data for local development

Linking people data to a place or geographic location, and its integration with geospatial information through the medium of “location”, can result in an improved understanding of social, economic, and environmental issues

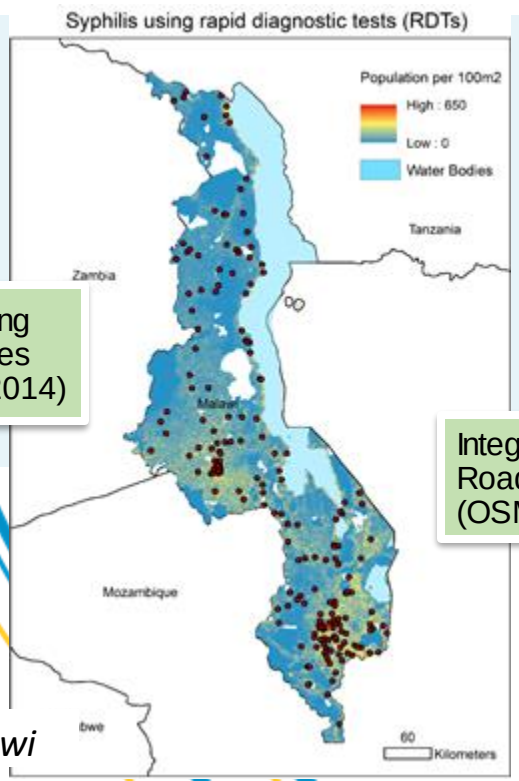


Source: Draft **Working PAPER - For EG-ISGI Consultation-** UN Expert Group on the Integration of Statistical and Geospatial information

Linking population with health facility data for accessibility mapping

[1] Mapping Distributions of SRH Services

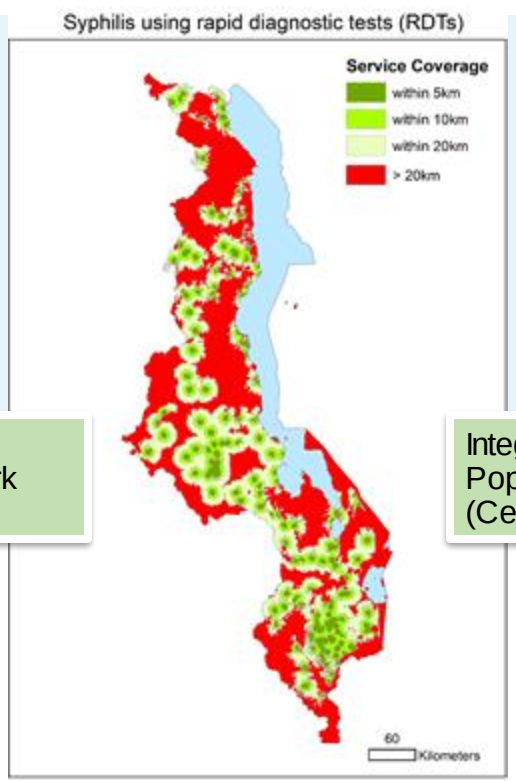
Mapping Services (SPA2014)



Malawi

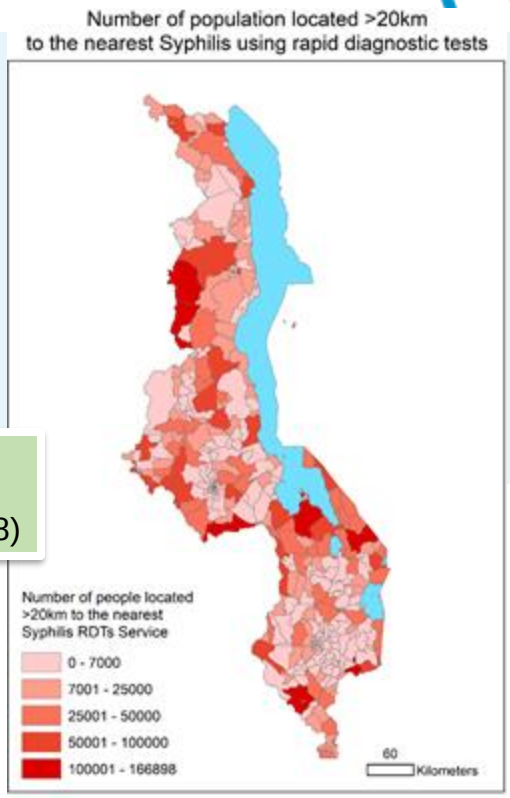
[2] Mapping SRH Service Coverage

Integrate Road Network (OSM)



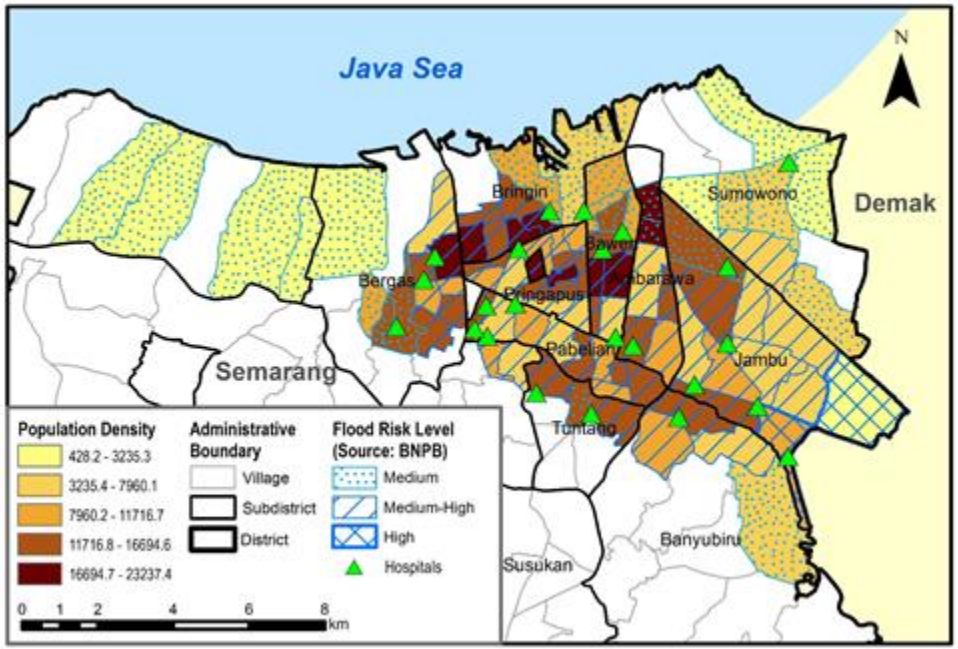
[3] Mapping Population's Access to Services

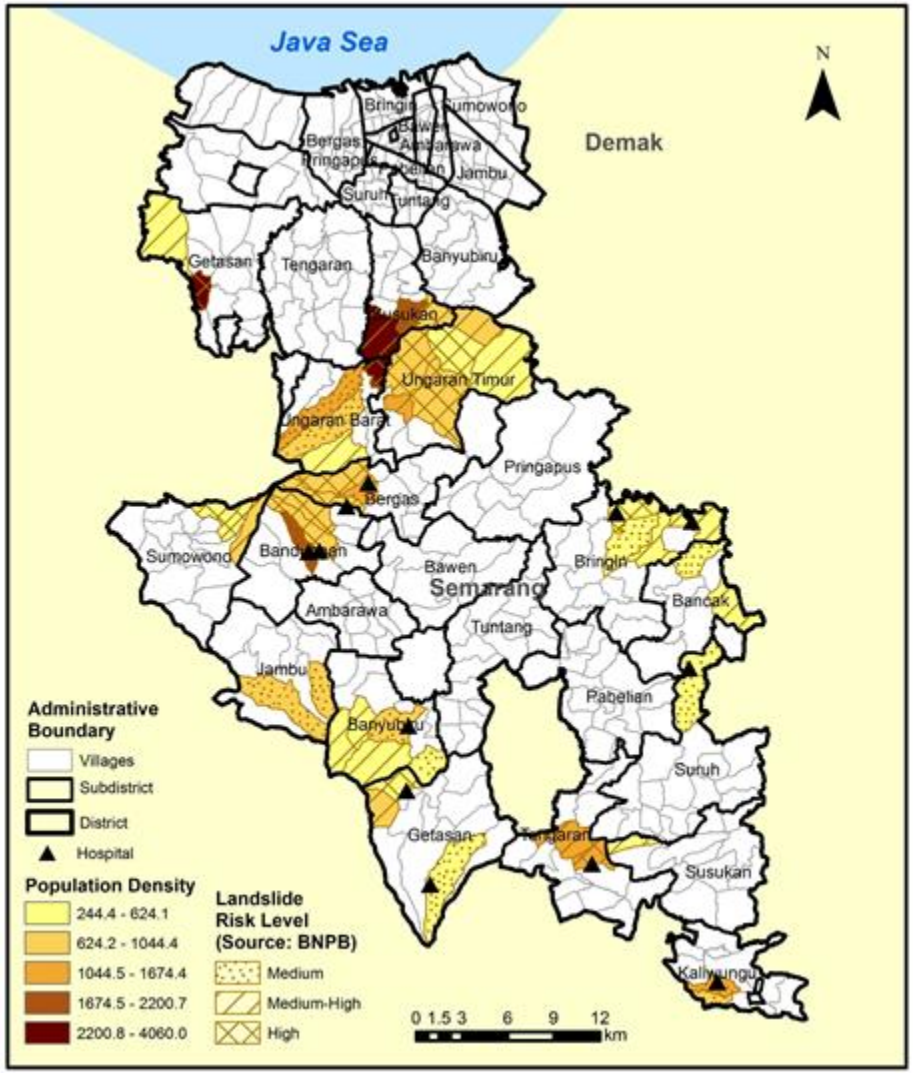
Integrate Population (Census2018)



Linking population with other climate change data for vulnerability mapping

Population density in Mid-High flood and landslide zones in Semarang, Indonesia (2010 Census)





Towards the SDGs Geospatial Roadmap

Data

Over 200 Census and Population ***Indicators*** at national and subnational levels

Analysis

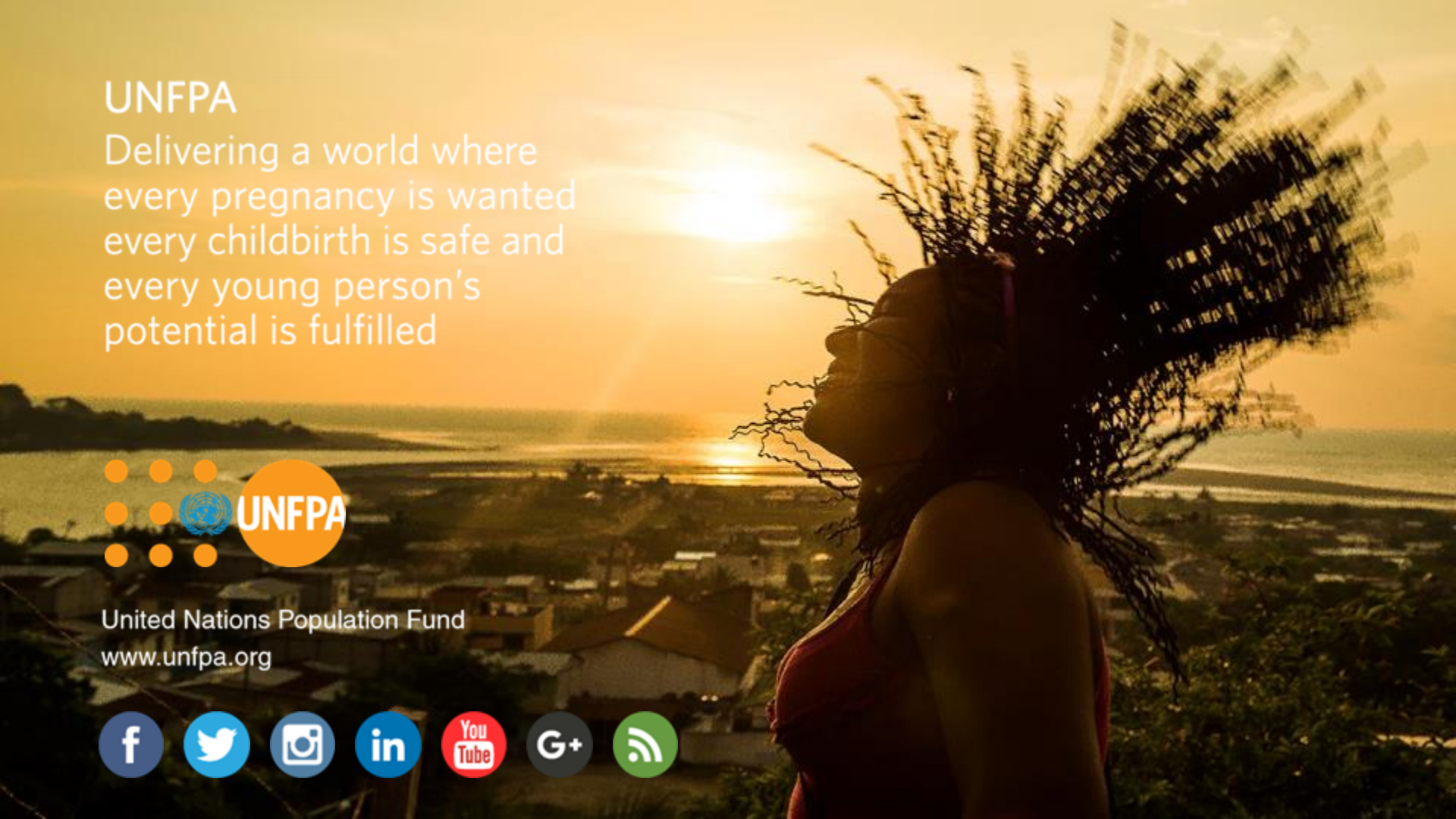
Integration of population data with other geospatial data on use cases at local levels

Visualization

Data ***Visualization*** and ***Dissemination,*** while ensure data privacy and confidentiality

Capacity

Capacity Strengthening on using GIS for SDG data disaggregation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