Integration of Geospatial and Statistical Information

African Thematic Conference on Managing a statistical organization in times of change

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Why We Need Geography: Unleashing the Power of 'Where'

- You cannot count what you cannot locate
  - Location affects nearly everything we do in life

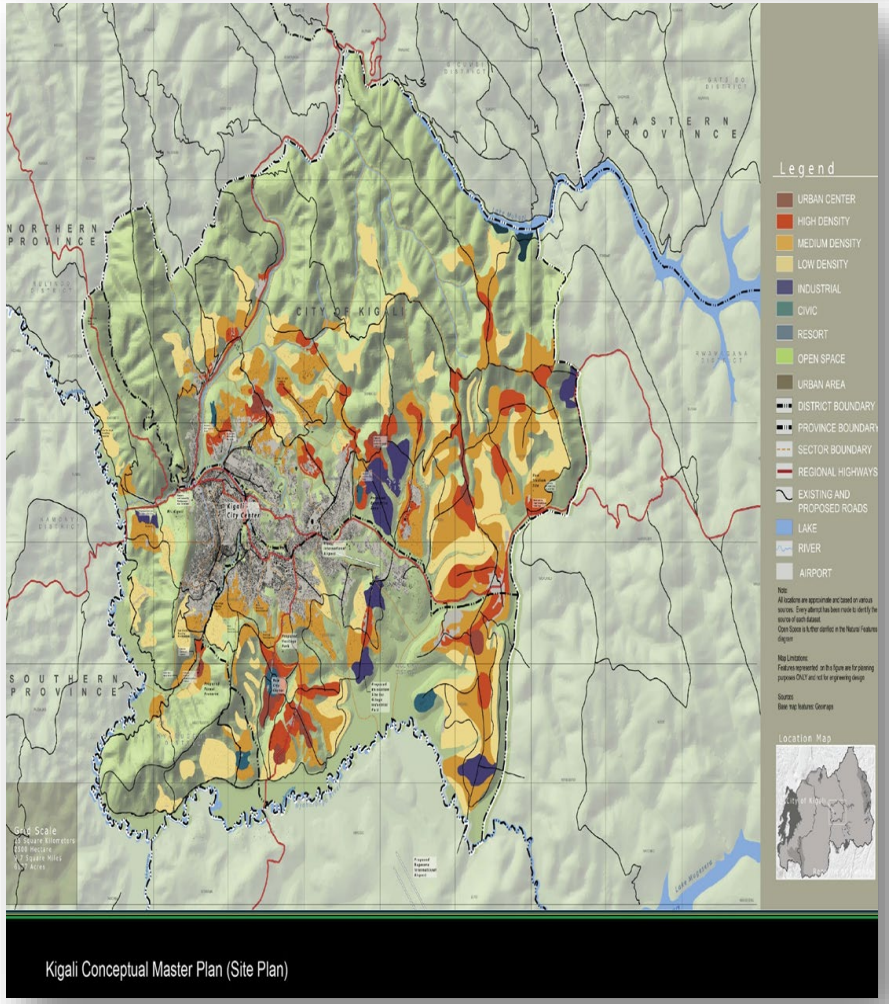
- Everything that happens, happens somewhere over space and time.

  And

- 80% of all human decisions involve a "Where?" question
- A right decision making requires the gathering and reviewing of up-to-date, cold & hard facts…
  - For the facts to be interpreted, understood, and linked to our goals and to our decisions, this needs to bring together data linked with the one thing they have in common : Location (**Where**)

Why We Need Geography: Unleashing the Power of 'Where'

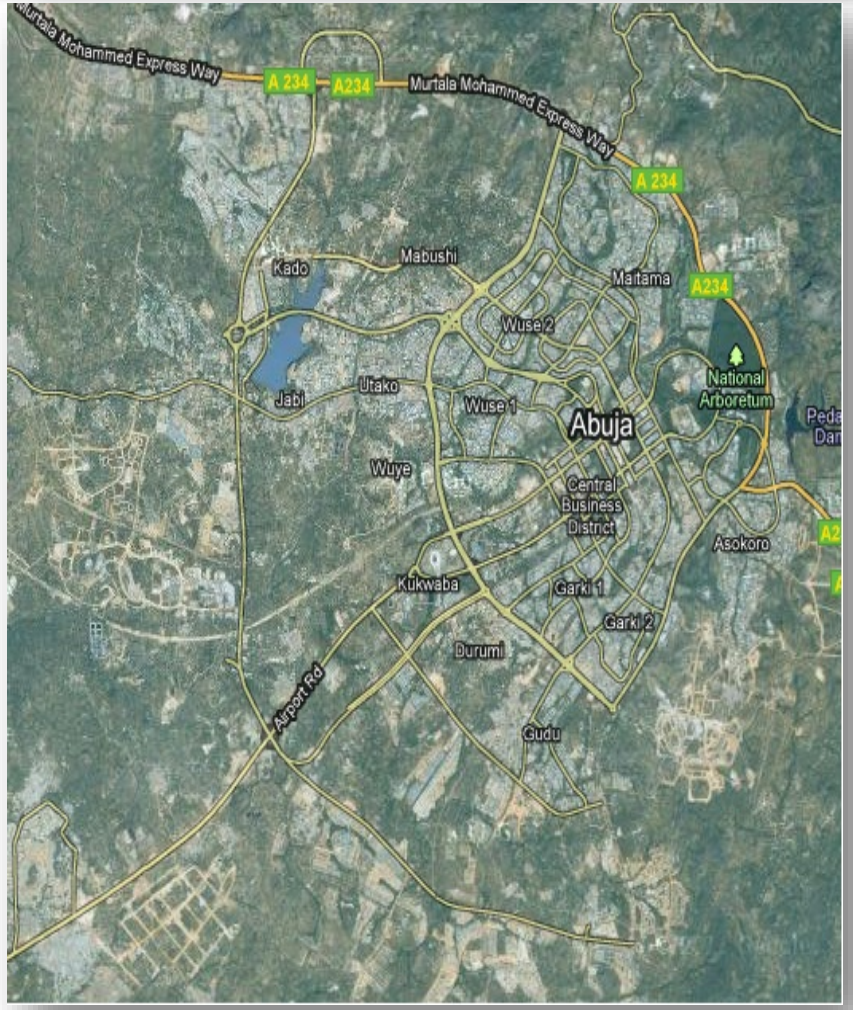
- Most decisions need to be anchored to geography
- Where is "it"?
- How far is A from B?
- How do I get from A to B?
- What is the extent/territory of some phenomenon?
- What areas are suitable for a certain activities?
- …



Kigali Conceptual Master Plan (Site Plan)

Why We Need Geography: Unleashing the Power of 'Where'

- Geospatial data and related information is a core component to the 2030 Agenda for Sustainable Development.
- Location information through geospatial data offers perspective, greater understanding, and a view of the data through a geographic lens.
- Geospatial data complements statistical information and together they tell a Member State a story about their circumstances that helps with planning, programs, and decision-making



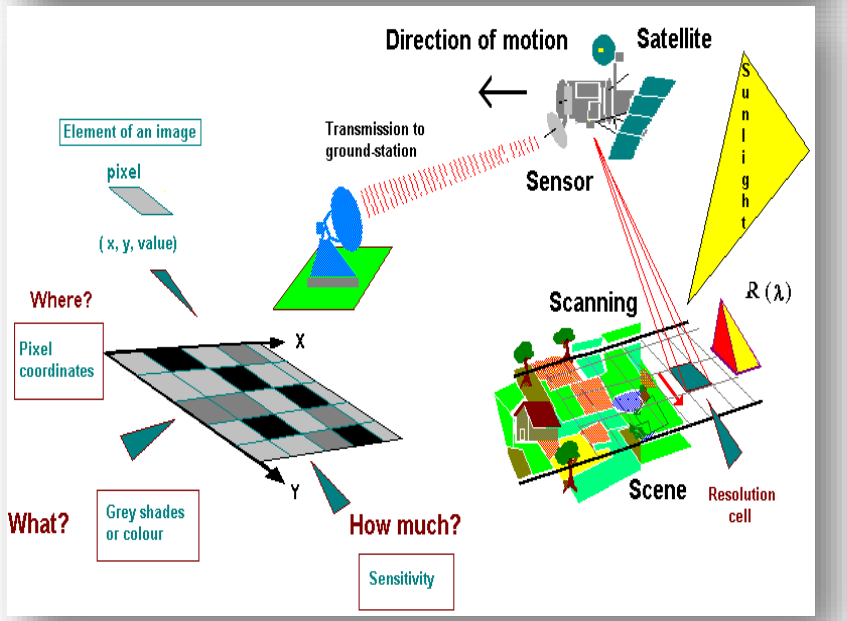
Why We Need Geography: Unleashing the Power of 'Where'

2010 round of PHCs: geospatial has drastically changed census cartographic methodology in areas including, and not limited to: the use of mobile devices, satellite imagery and Global Positioning System; sampling frames, address register and field verification methods.

2020 Round of Censuses: UN Principles & Recommendations for PHCs, Rev.3, "… to ensure complete integration of statistical and geospatial information…" (para. 349, UNSD, 2015)

Paradigm Shift: Expanding the Data Ecosystems

- Not all new data sources can fit into traditional/official statistical systems
- New sources constantly being discovered.
- New uses evolving
- NSSs cannot accommodate them
- Expand the data ecosystem beyond NSS



The Policy Drivers : Global Need for Spatially-Enabled Complex Information

- The presentation aims to raise awareness of the benefits of geospatial tools in dealing with timeliness and data quality issues, which will encourage and provide the basis for policy dialogue on the use of the technology between decision makers, geospatial information specialists, and other stakeholders.

National Development Plan

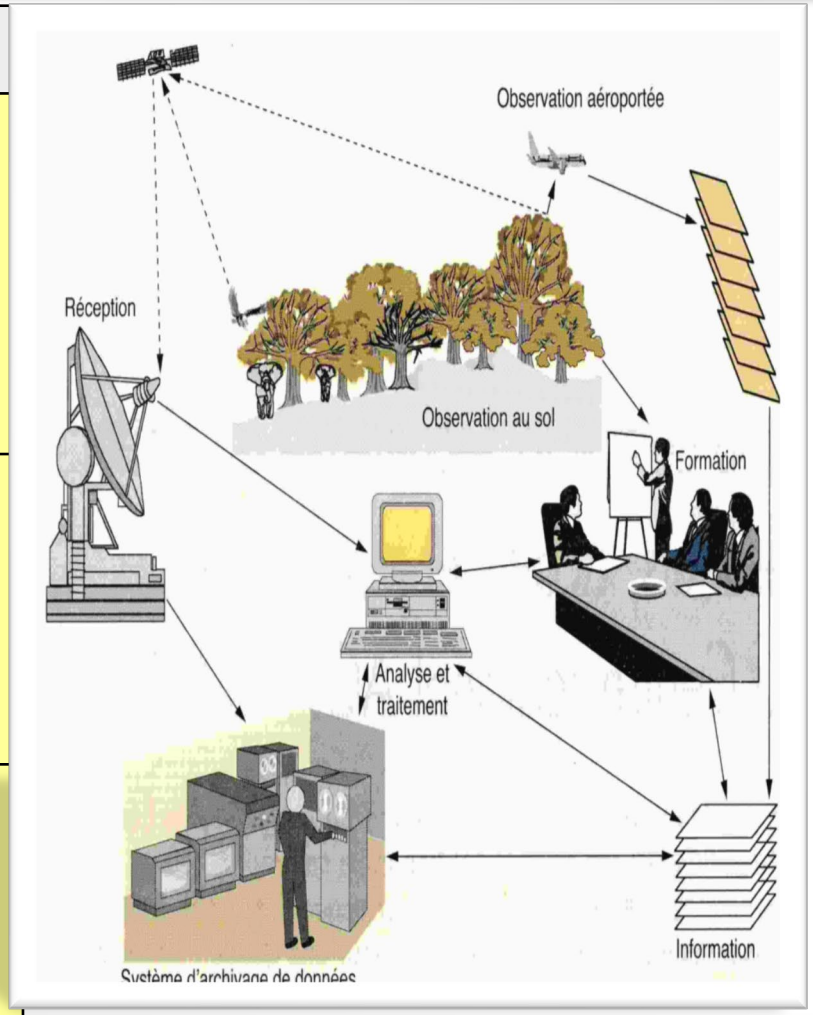
THE GLOBAL GOALS
For Sustainable Development

Agenda 2063
The Africa We Want

Geospatial Information Technologies

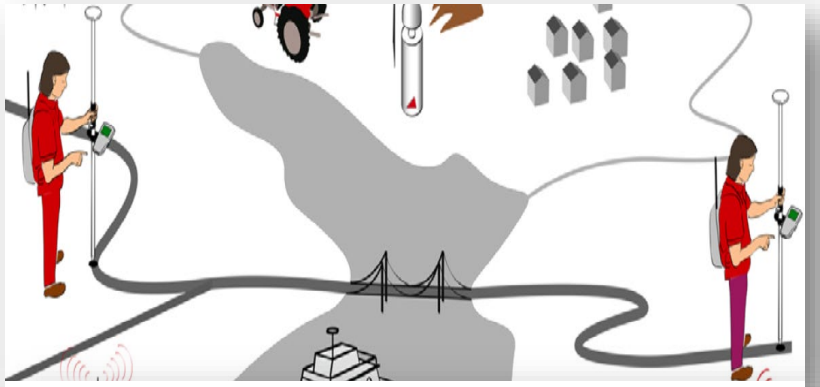
- Geospatial technologies refer to all the means used for the measurement, analysis, and visualization of features or phenomena that occur on Earth. They include three different technologies that are all related to mapping features on the surface of Earth:
  - Global Positioning Systems (GPS)
  - Geographical Information Systems (GIS)
  - Remote Sensing (RS)

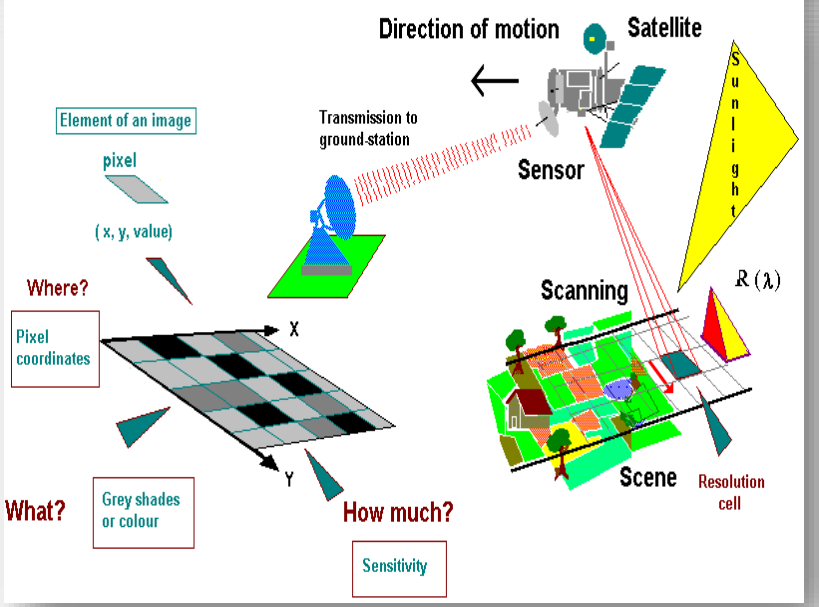
Definitions	
GPS	Network of satellites transmitting signals allowing GPS receivers to determine location, speed and direction
GIS	System for capturing, storing, checking, integrating, manipulating, analyzing and representing data which are spatially referenced to the Earth
RS	Science and Technics of obtaining information about a phenomenoa without being in contact with it



What GIT Can Do

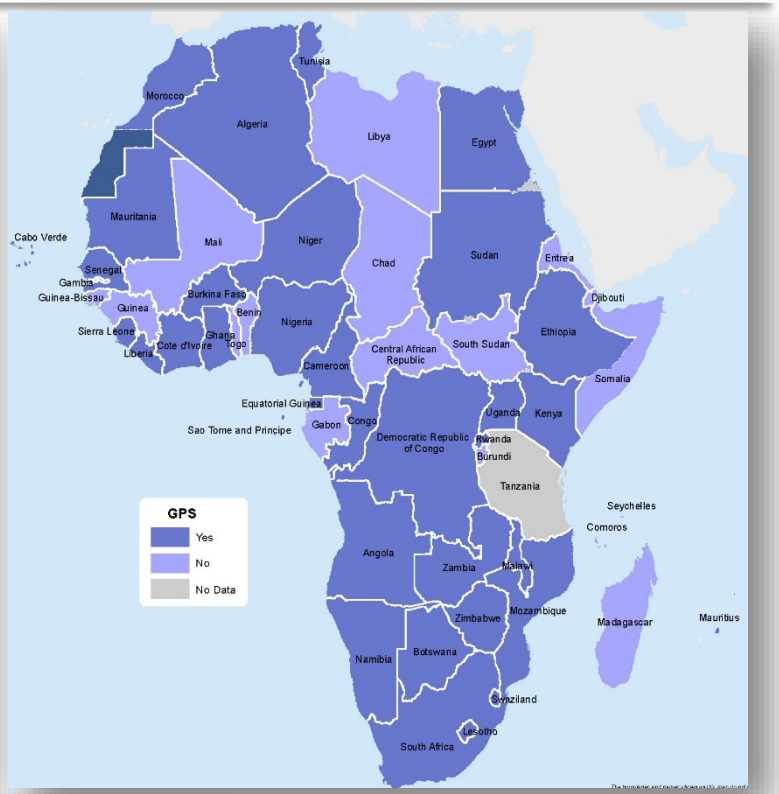
Three different technologies that are all related to mapping features on earth	
GPS	More accuracy in data collection Recording locations
GIS	Data analysis and visualisation Data mining into information, knowledge and decision-making
RS	Primary data acquisition Data processing Data interpretation





Use of geospatial technologies in censuses operations by African countries

RS	GIS	GPS
65%	67%	67%

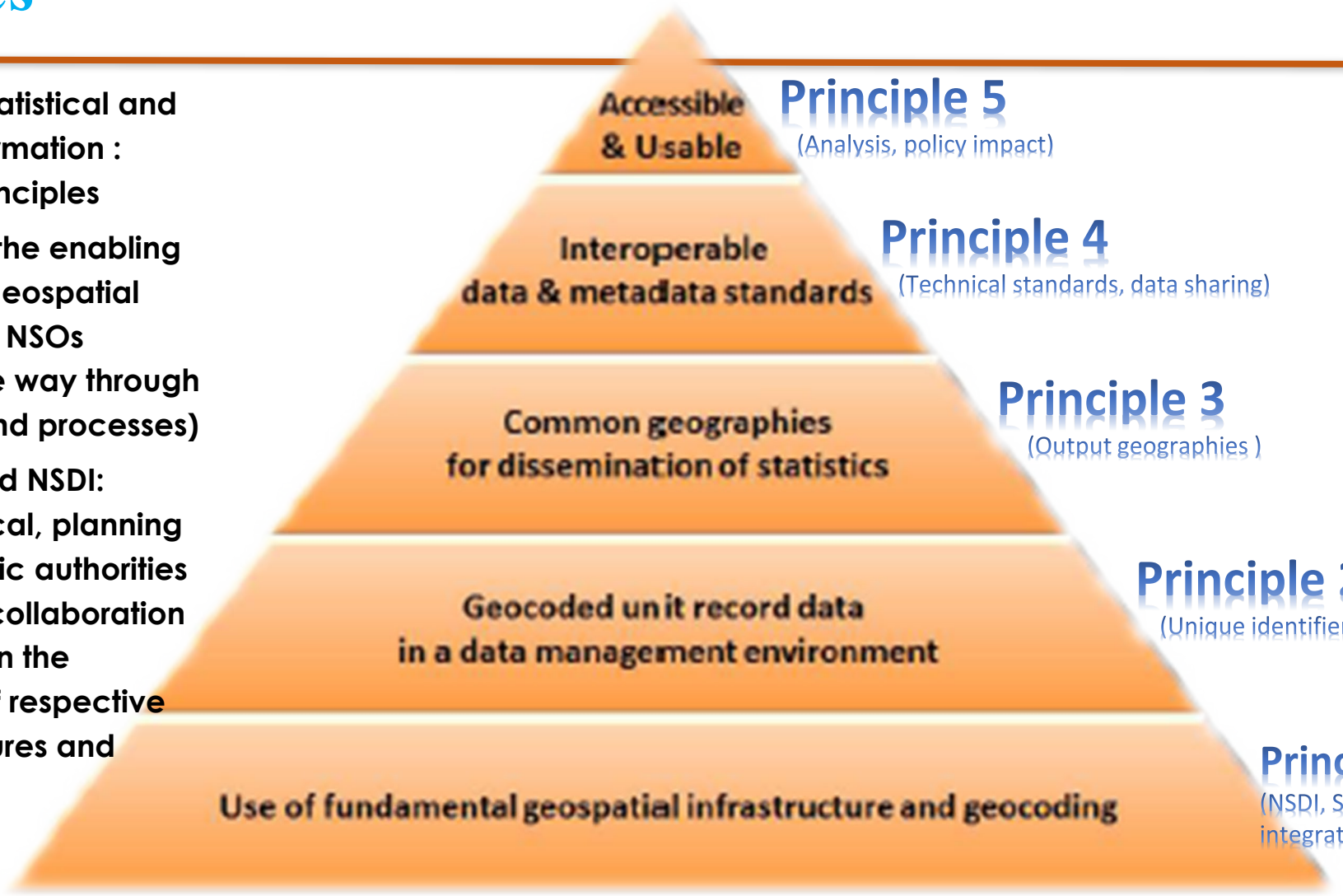


United Nations
Economic Commission for Africa

UN-GGIM: AFRICA

The African Statistical Spatial Framework : Overarching Principles

- Integration of Statistical and Geospatial Information : Overarching Principles
- Mainstreaming the enabling capabilities of geospatial technology into NSOs activities (all the way through training, data and processes)
- Linking NSDS and NSDI: National statistical, planning and cartographic authorities have effective collaboration between them in the development of respective data infrastructures and systems.



Demand for small geography data.
More frequent data.
Policy impact

ISO Standards
OGC Standards
Statistics Principles

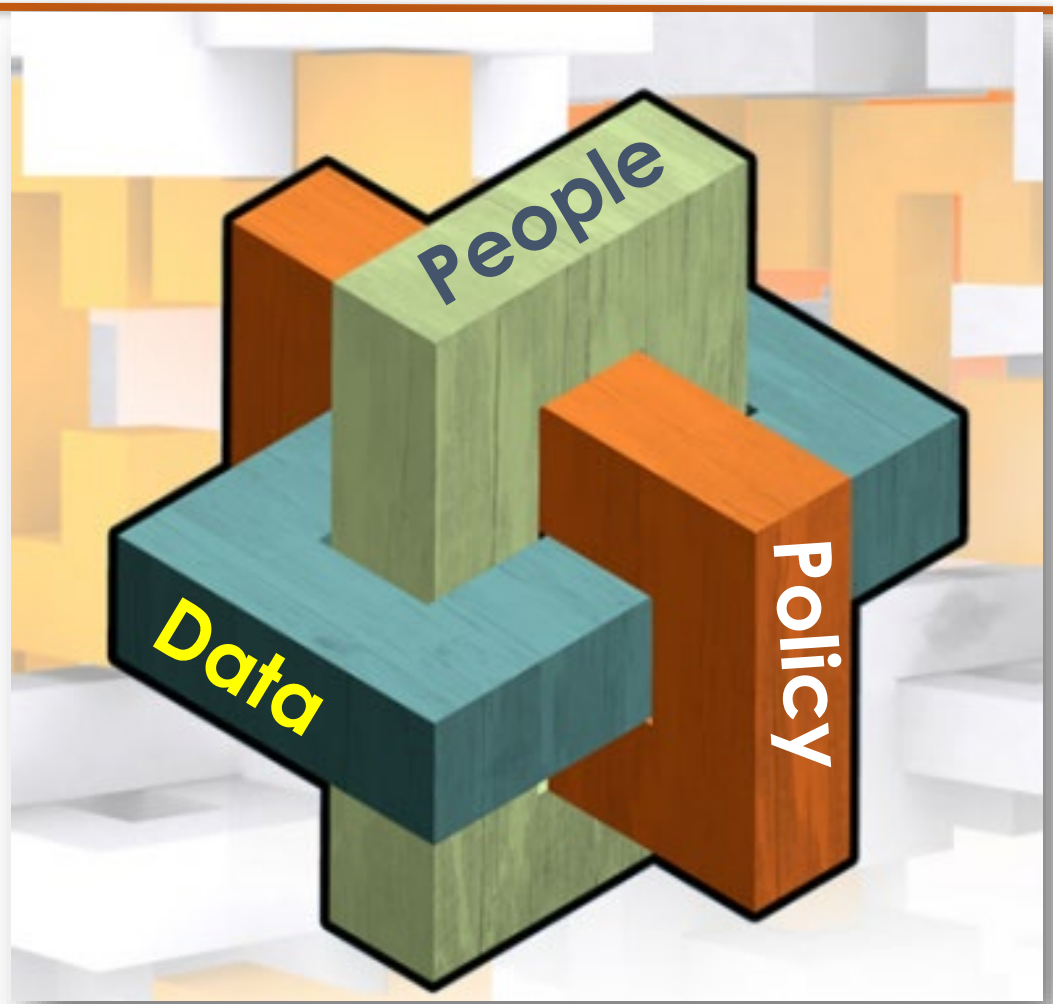
Standard geographic administrative boundaries (province, municipality, etc.).

No PIN.
Link mainly through the geography.
Geography not always standardised.

Policies
More institutional
Political leadership and support

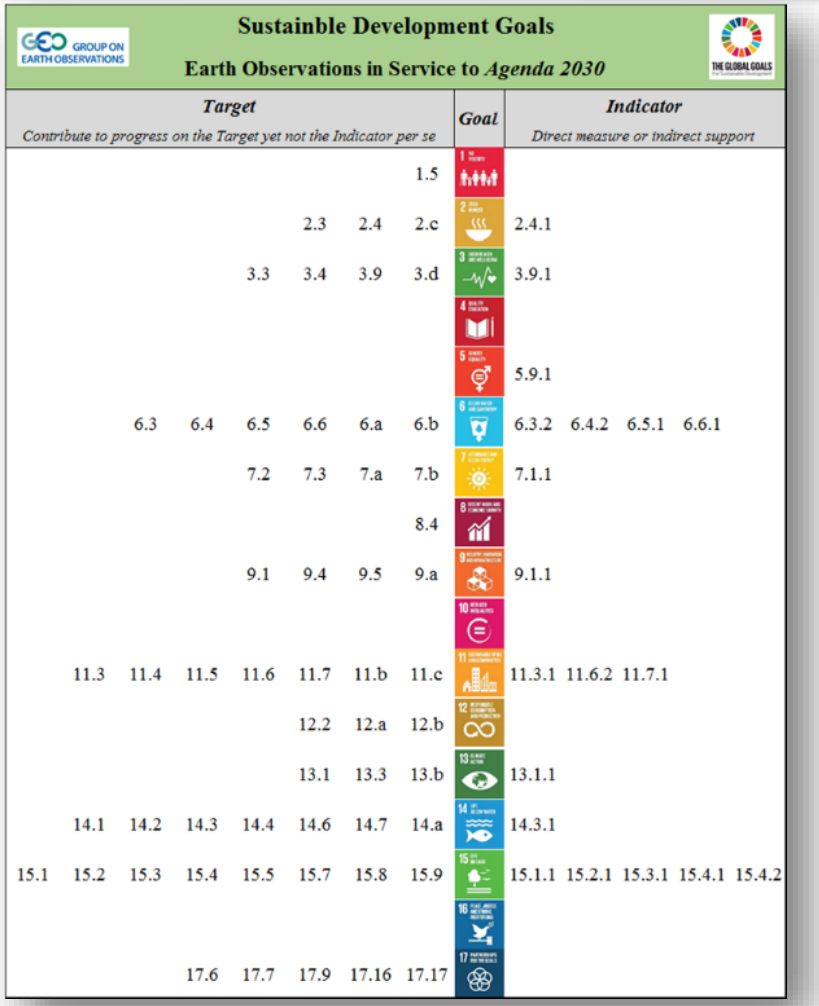
The African Statistical Spatial Framework: Dimensions

- A successful integration of geospatial information and Statistical Information requires to look at the following dimensions:
  - **Scale** : The **scope of the geographic space** in which the integration is due to take place.
  - **Policy** : The **policy dimension necessary** at all levels on the Scale axis to initiate and harmonize the strategies and related regulations in order to smoothly achieve full integration
  - **Institutional** : The institutional **arrangements necessary** to achieve real integration, in accordance with the orientation of the two compatible policies.
  - **Modelling** : The **component of the integration process** dealing with the technical, technological, scientific abstraction and their related functional and procedural interactions



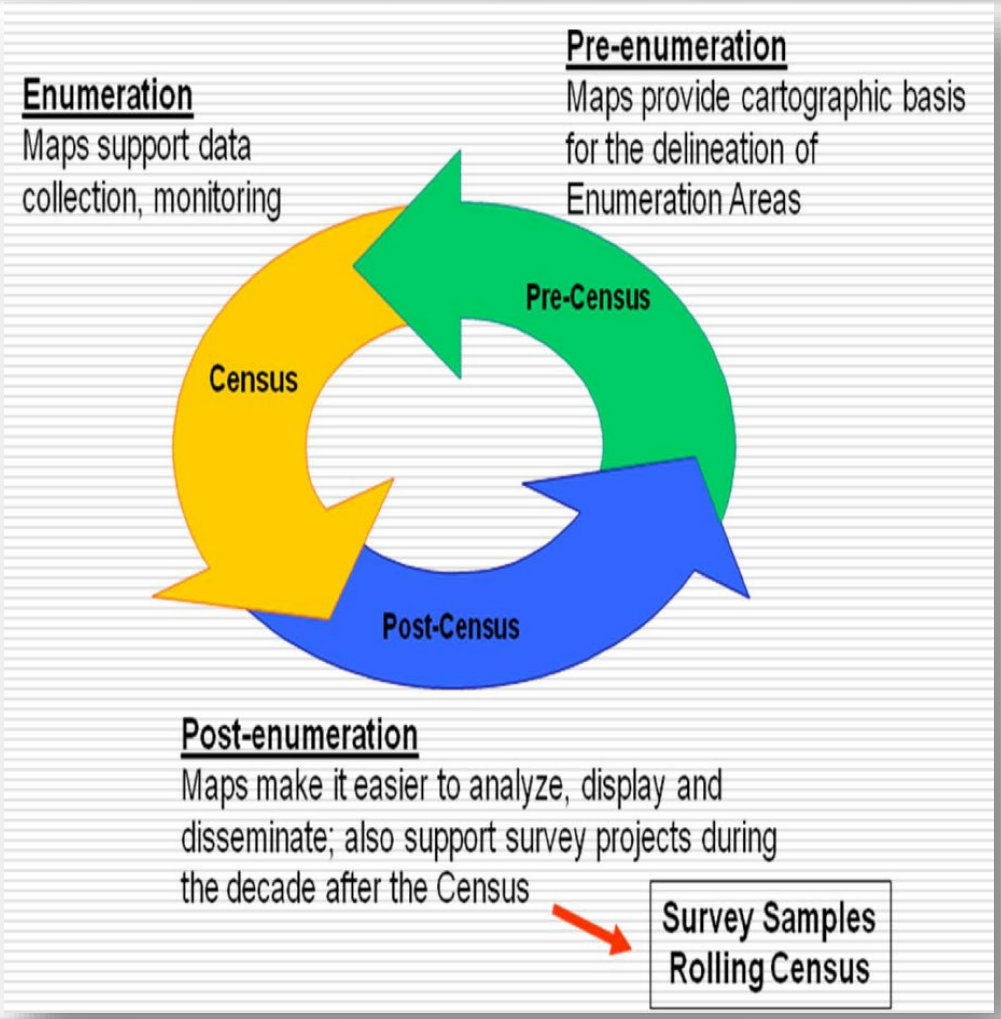
The SDGs : Leaving No One Behind

- IAEG-SDGs: Global Indicators
- SDGs are statistical and Geospatial
- 2/3 of the SDGs indicators need spatially-enabled data.
- Require multi-stakeholder collaboration



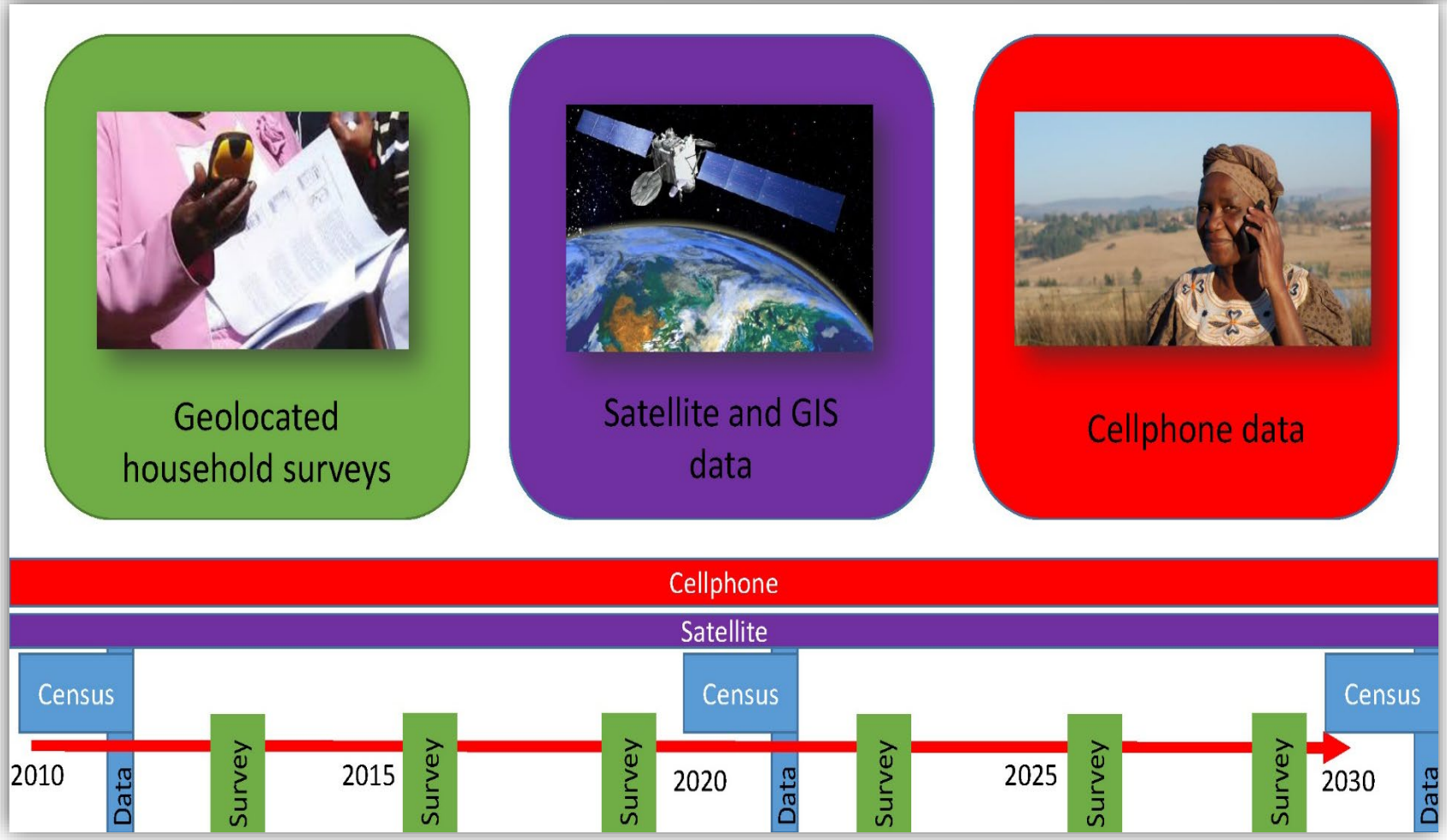
Geography and Statistics: Global and Regional Provisions

- UN Principles and Recommendations for Population and Housing
- Censuses, Rev.2, recommends the use of geospatial technologies for improving traditional methods of census mapping (adopted by UNSC in 2007).
- 2020 Round : Adoption of GIS should be a major strategic decision



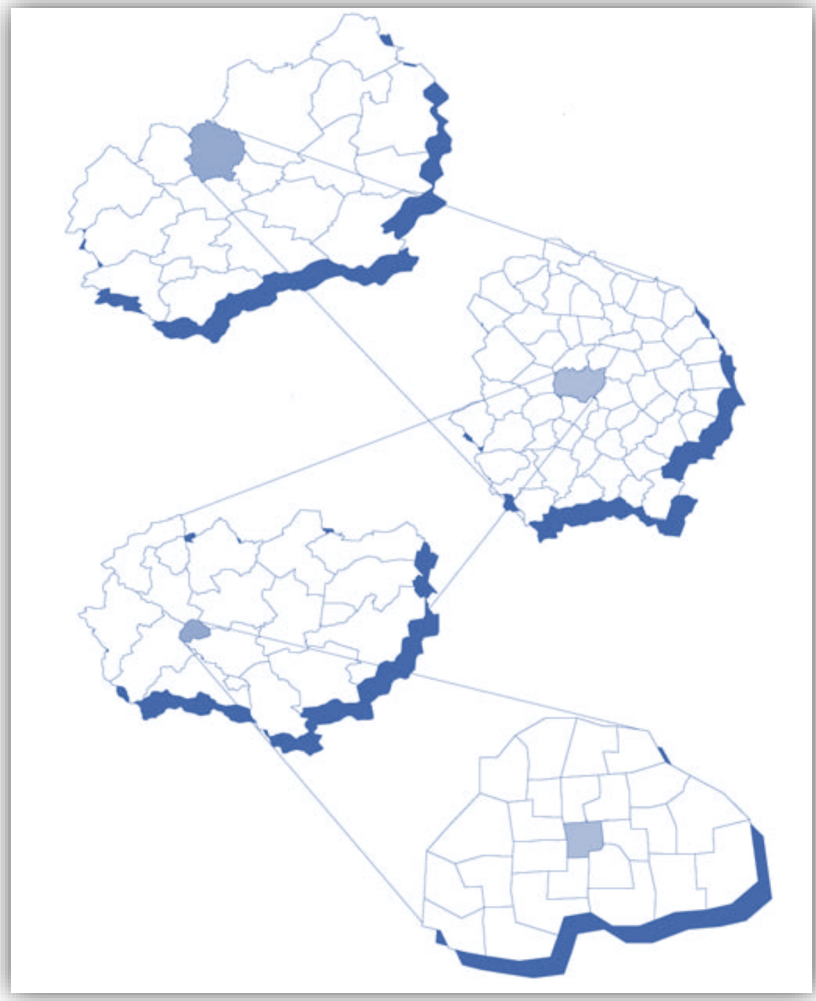
The Challenge : Counting in Real Time

- All SDGs are based on ensuring a certain percentage of the population has access to specific services or resources, or achieves a certain level of social, economic, or environmental health
- Need for accurate, subnational, ongoing data on denominators



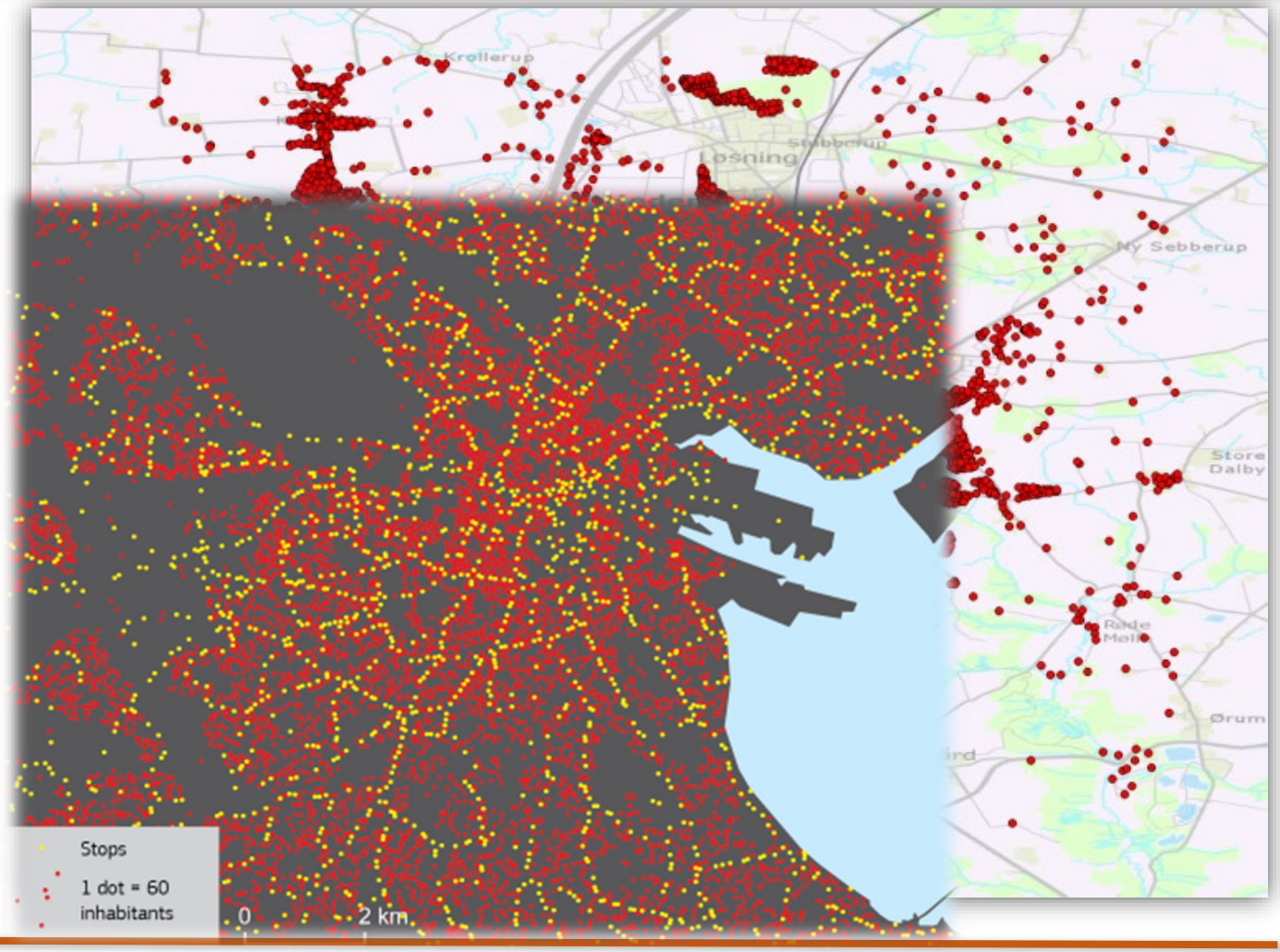
Benefits of Geospatial technology : Deconvolution [From Global to Local]

- Post-enumeration:
  - GIS, Census Database, Web maps, Atlases
  - Visualize, analyze, present and disseminate census results:
  - Used during analysis as a unit for aggregation / disaggregation
  - Report generation by different levels of administrative units (Admin 1(State/region), Provinces, District, …EA.)
  - Web maps used for dissemination of census results
  - Resulted in gains in timeliness, accuracy and effectiveness of the census operation
  - Permitted data disaggregating (by geography) to the lowest administrative unit



Benefits of Geospatial technology : Enriching statistical data [Infrastructures]

- Geospatial analysis
- Target 11.2 indicator example
- 11.2.1. Proportion of the population that has a public transit stop within 0.5 km
- Data sources needed:
  - Population distribution (grid/addresses): include data on a spatially detailed distribution of residential population inside the cities or regions.
  - Road network: The road segments should include attributes allowing for a selection of streets accessible by pedestrians.
  - Public transport data: the location of stops and stations (frequency of departures at these stops)



The Nexus Issues : Competing for Power, Privilege

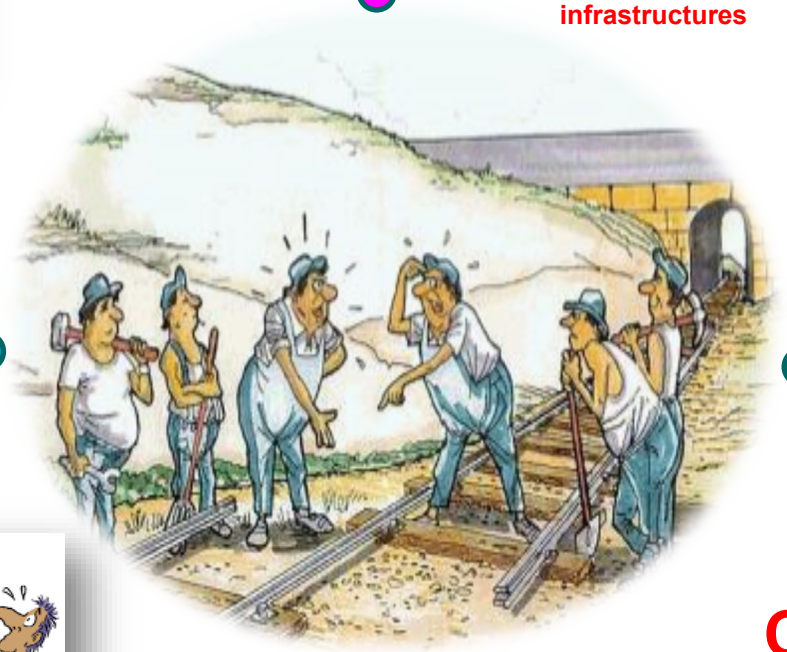
- Systems: most countries in Africa lack the address register system, most streets have no names/street addressing system
- Lack of coordination: there is no linkages between the statistical systems and the geospatial systems and infrastructures
- Duplication of Effort: the statistical offices create their own data on administrative boundaries and topographic maps
- Insufficiencies in data periodicity and timelines
- Lack of suitable base maps in scale and currency

Leadership

Leadership: Establishment of effective national leadership

Cooperation

institutional arrangements for operationalizing an integrated and coherent approach with other information infrastructures



Resources

Mobilization of resources needed to effectively produce development information

Capabilities

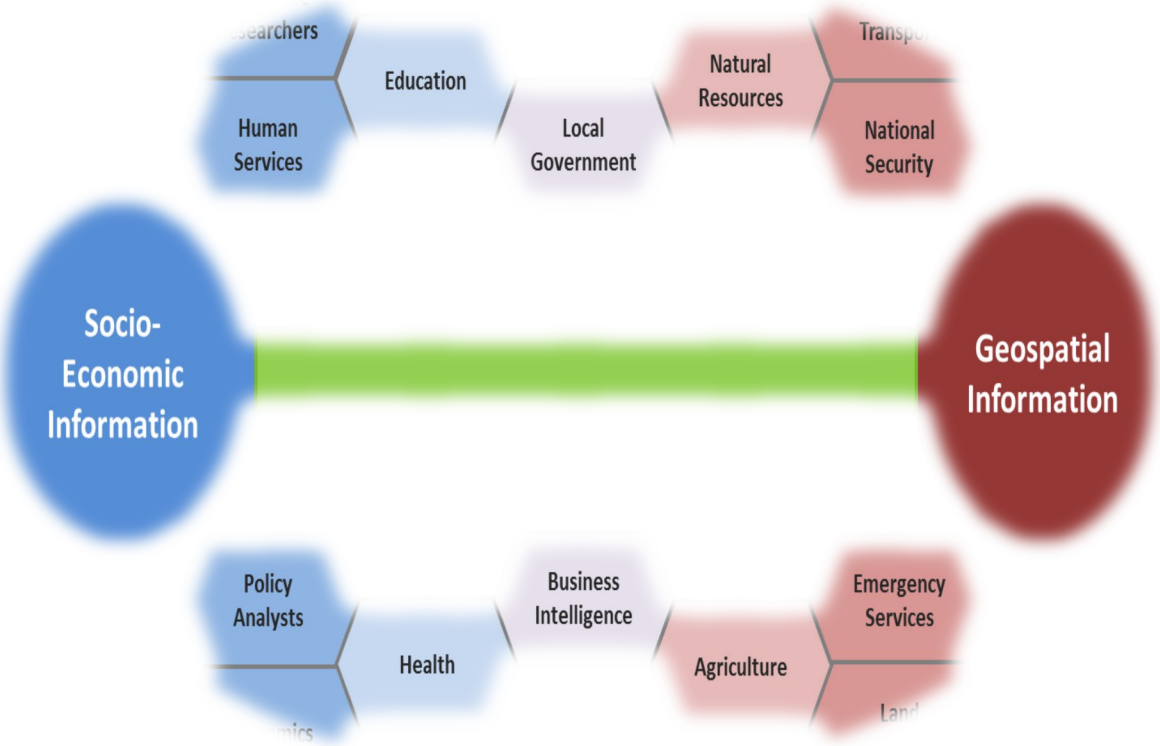
Member States capabilities to ensure geospatial data, products and services are readily available

Africa's Statistics Nexus Issues

Core Data Lack of consistency	Data availability problems Data comparability problems Inconsistency between national and international data Insufficiencies in data periodicity and timeliness
National Statistical Systems	Domestic under funding Conflicting donor priorities Limited institutional capacity Low demand for quality statistics
Capacity : Lack of critical mass	Recognition & Retention of Professionals
Governance: Poor coordination Lack of dialogue between metastatic regional machineries	Several sub-regional, regional and international organizations are active in statistical development on the continent: African Union Commission, African Development Bank, AFRISTAT, Economic Commission for Africa, Paris21, Regional Economic Communities….

Quick Wins : Information Infrastructure

- A New Paradigm : The National Development Information Infrastructure (NDII)
  - The foundational, authoritative and up-to-date spatially-enabled statistical information that are consistently available and accessible over time for informed decision-making at the local, national, regional, and global levels.
- The Global Statistical Geospatial Framework
  - Integration of geospatial and statistical information, NSDI and NSDS Linked
- SALB Project :
  - Building, updating and sharing common administrative boundaries.
- 2020 Round of Censuses
  - Promote Geospatially enabled censuses in Africa. Build geo-referenced dwelling frame



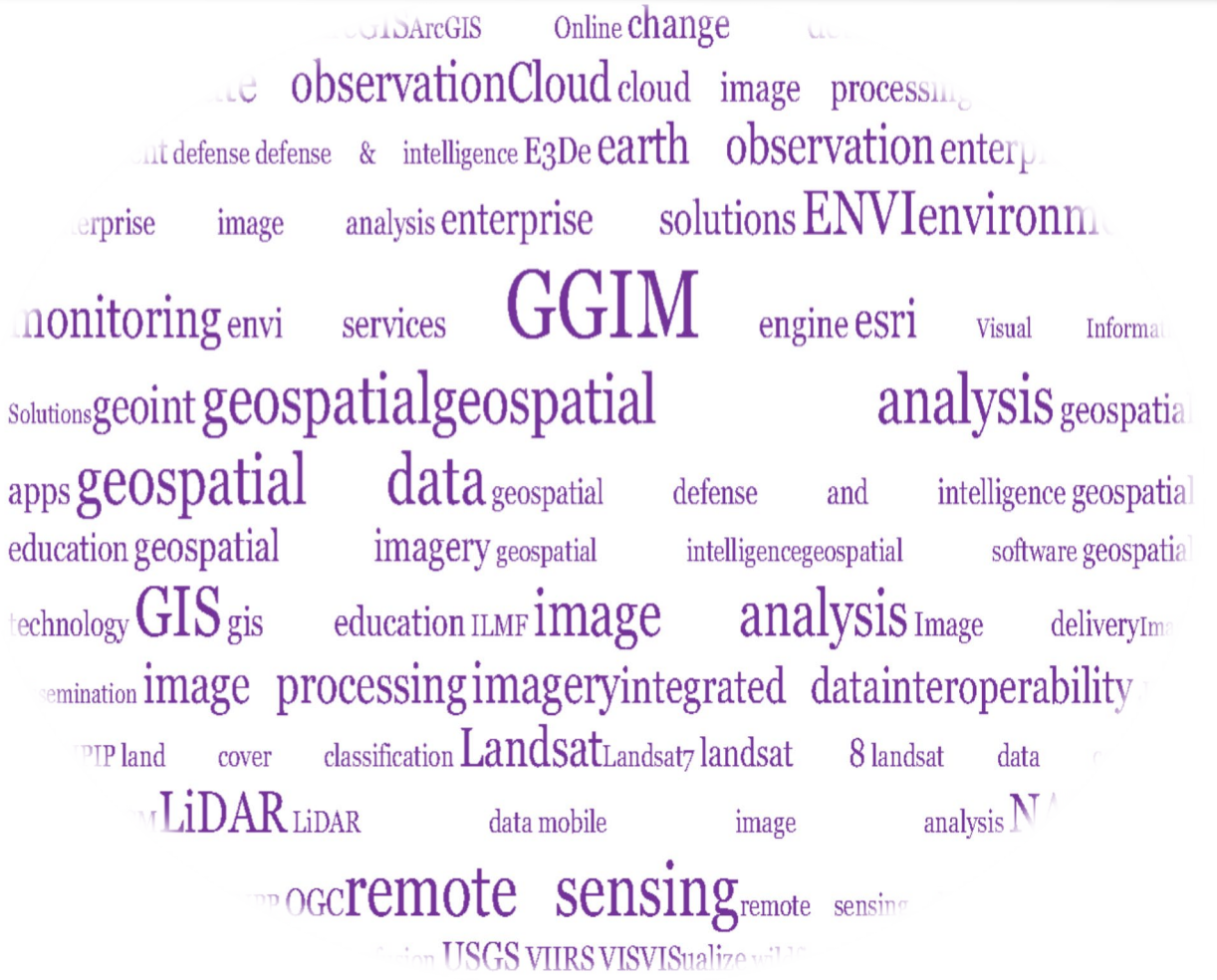
Concluding Remarks

- Geography is important to Statistics : Visible benefits have been accomplished through the **adoption and sound application** of GIS, Remote Sensing and other geospatial solutions, tools and techniques;
- GIS have modified the **way** in which data from NSOs are **collected and stored and are produced**.
- Many countries have **integrated GIS into their census mapping processes and household listings** in some regard, and most now have developed a solid geo-referenced (GPS) database of dwelling locations.
- Geospatial analysis must become a core competency in any statistical Office : Our **aim is to mainstream geospatial information technology into NSOs** activities in Africa.
- **Strengthen collaboration** between the mapping agencies (NMA) and national statistical institutions (NSO) : Linking NSDI and NSDS
- ACS on Integration: **Full Section on GIS** to be expanded as **Digital Earth** in partnership with Australia

Thank You….

Quote from Pali Lehohla:

" As a major step forward, following on far sighted innovations of Latin American statistics systems, and in particular those of Brazil and Mexico, the African Statistics Systems should leapfrog and embrace location-based data ecosystems as a necessary and essential element of far reaching innovation for sustaining their statistics systems"…



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THANK YOU

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