Spatially-Enabled Statistics for Africa

The African Spatial Statistical Framework

United Nations
Economic Commission
for Africa
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Geoinformation &
Spatial Statistics
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Andre Nonguierma

International Workshop on Global Fundamental
Geospatial Data Themes for Africa
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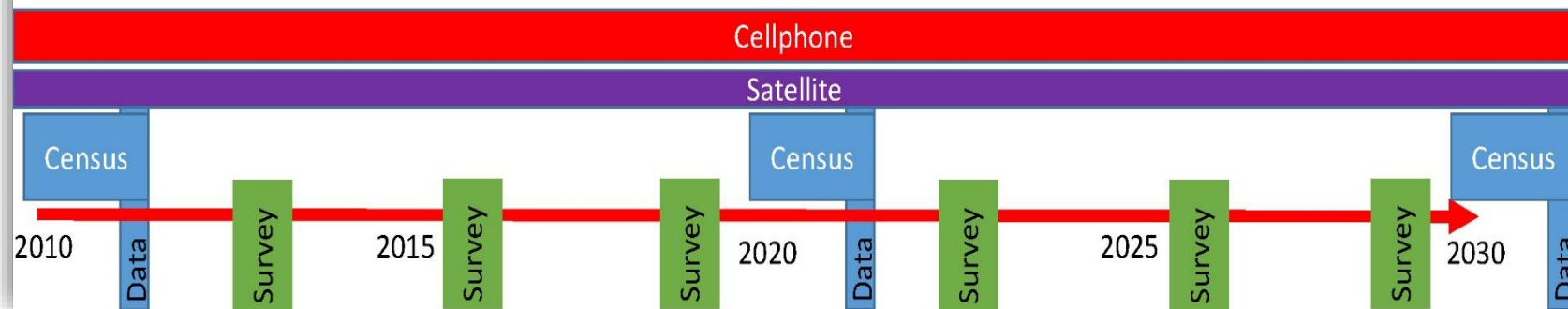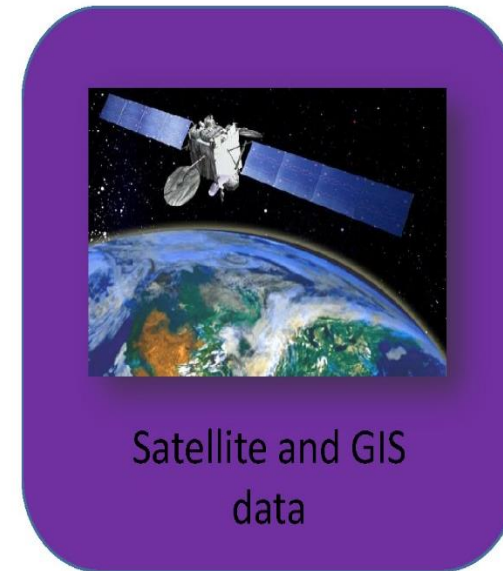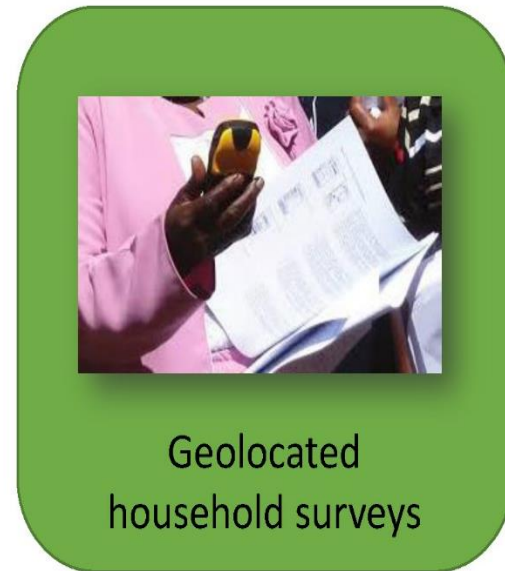GLOBAL GEOSPATIAL
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The Challenge : Counting and Locating

- National census data will continue to be our most important data source

- Typically we need just one census data point : So, no consideration for the location attributes.

- After we count "beans and heads" we start looking for anchoring the number to place.
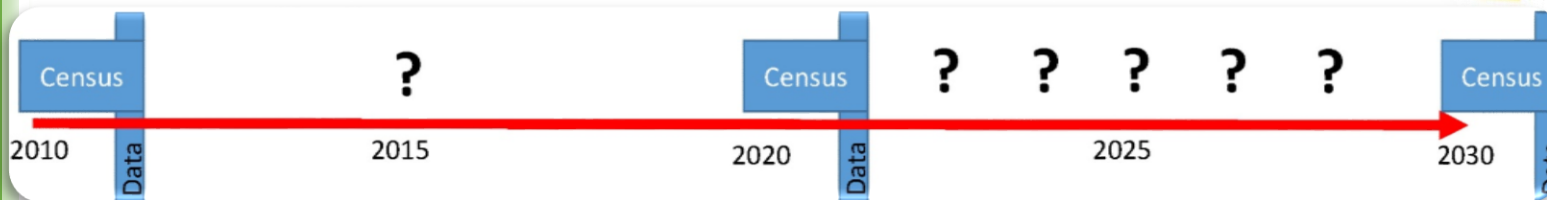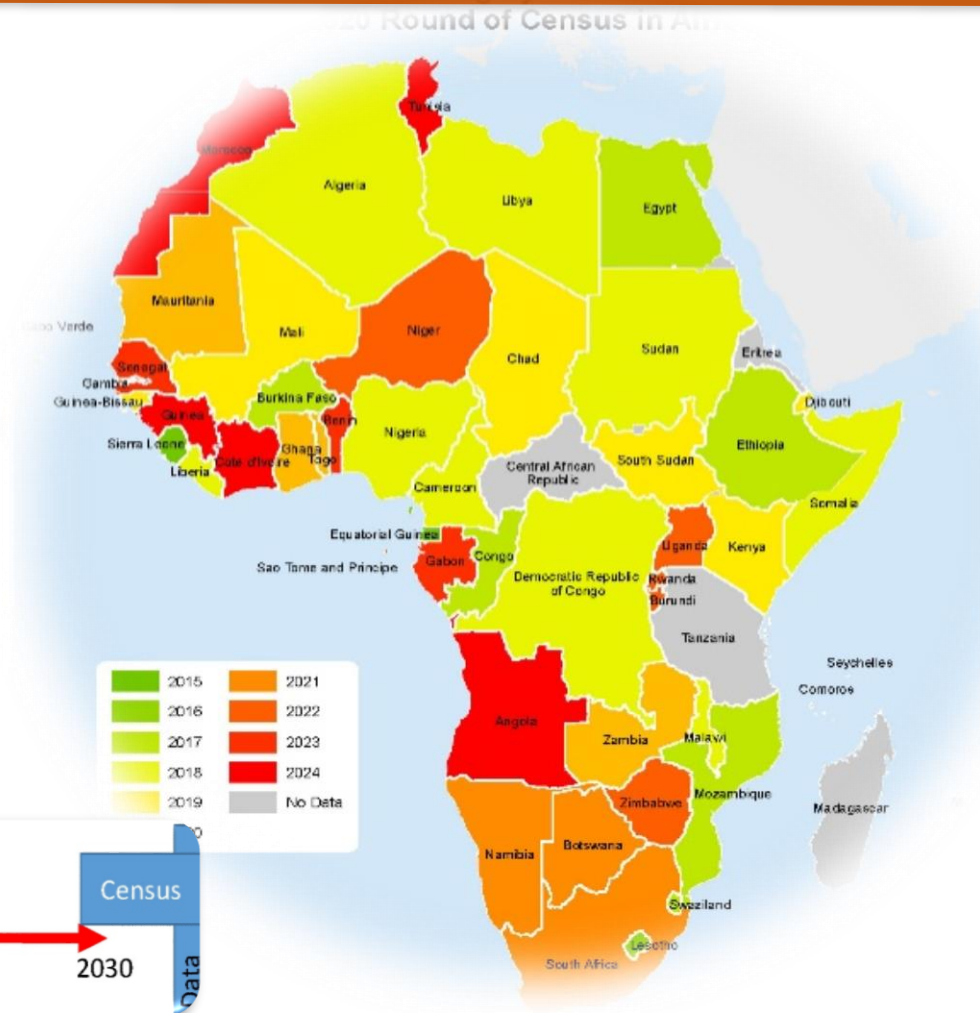
The Challenge : Counting in Real Time

- 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

- Translating complex cycle of data acquisition, processing, analysis, visualisation and decision making into real time monitoring and management

- Geospatial industry is moving from analyzing and presenting discrete data sets towards working with streams of spatially-enabled data (e.g. real time location-based mobile services).

Geolocated household surveys

Satellite and GIS data

Cellphone data

Cellphone

Satellite

| Census | | 2015 | | 2020 | Census | | 2025 | | 2030 | Census |

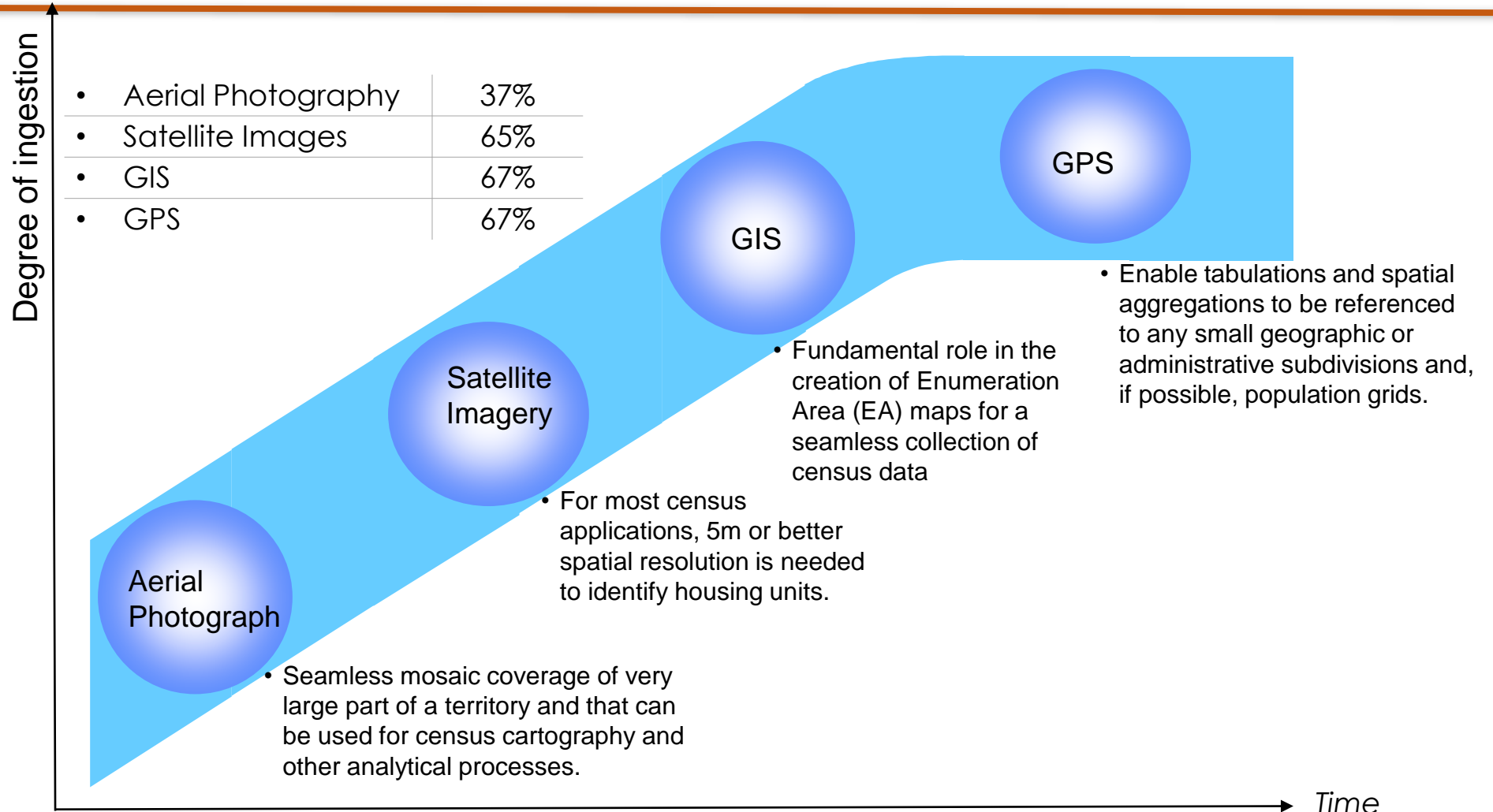2010 — Data — Survey — 2015 — Survey — Survey — 2020 — Data — Survey — 2025 — Survey — Survey — 2030 — Data

Competition for Power, Privilege, Influence – Expading the Custodiaship Principle

- addressing coordination challenges requires not only to promote advances in technology and data, but before technology solutions we need political commitment.

- Because, policy development is a highly sensitive issue, as it involves people, end-users and decision/policy makers, their influence and their privileges in the respective communities concerned.

- Therefore any process should start in the minds of the people, the mind of the most influential ones: policy makers and decision-makers.

- The burning question we need to address is how we arouse their interest in this initiative? How do we establish an effective national leadership to steer the process

- Custodianship Principle : Custodians rather than owners

Status of Mainstreaming Geospatial into Statistical Processes in Africa

The question is no longer about the ingestion of geospatial technology, but what are some of challenges and commonalities in Africa

Degree of ingestion

•	Aerial Photography	37%
•	Satellite Images	65%
•	GIS	67%
•	GPS	67%

GPS

• Enable tabulations and spatial aggregations to be referenced to any small geographic or administrative subdivisions and, if possible, population grids.

GIS

• Fundamental role in the creation of Enumeration Area (EA) maps for a seamless collection of census data

Satellite Imagery

• For most census applications, 5m or better spatial resolution is needed to identify housing units.

Aerial Photograph

• Seamless mosaic coverage of very large part of a territory and that can be used for census cartography and other analytical processes.

Time

Use of geospatial technologies in censuses operations by African countries
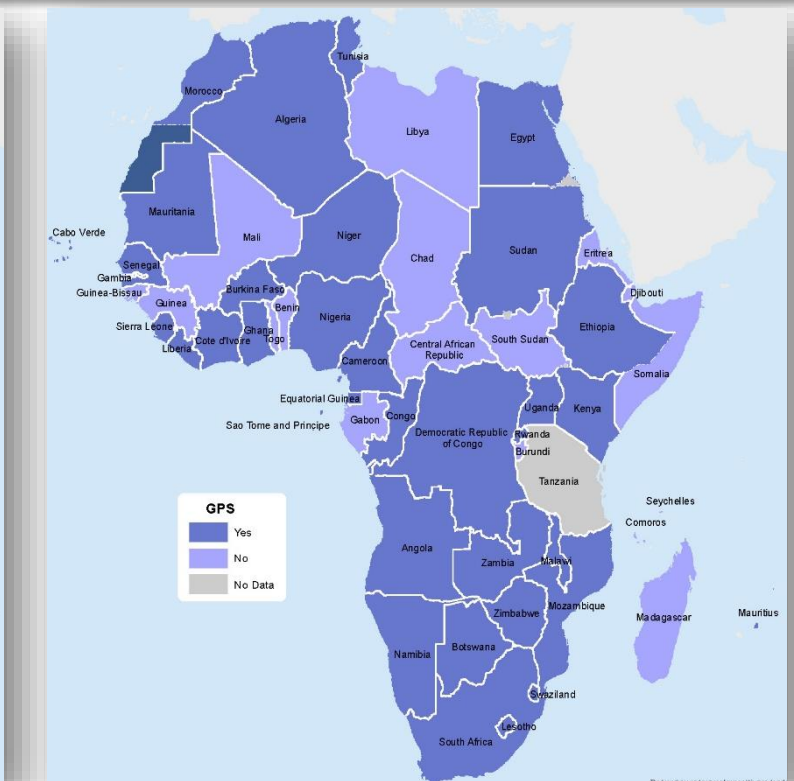
| RS	GIS	GPS
65%	67%	67%

Nexus Issues in Linking Geography and Statistics

- Lack of suitable base maps in scale and currency

- 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

Leadership

Leadership: Establishment of effective national leadership

Resources

Mobilization of resources needed to effectively produce development information
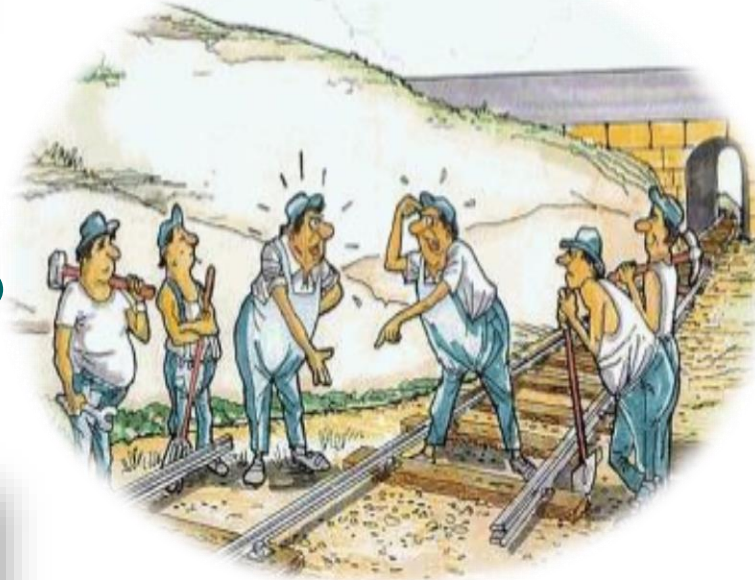
Cooperation

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

Capabilities

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

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The African Statistical Spatial Framework : Overarching Principles

- **Integration of Statistical and Geospatial Information : Overarching Principles**

- **Mainstreaming the enabling capabilities of geospatial technology into National Statistics Offices 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.**

Tips:
- High-level framework
- Not a one-size-fits-all
- Start anywhere

Principle 5
(Analysis, policy impact)

Accessible & Usable
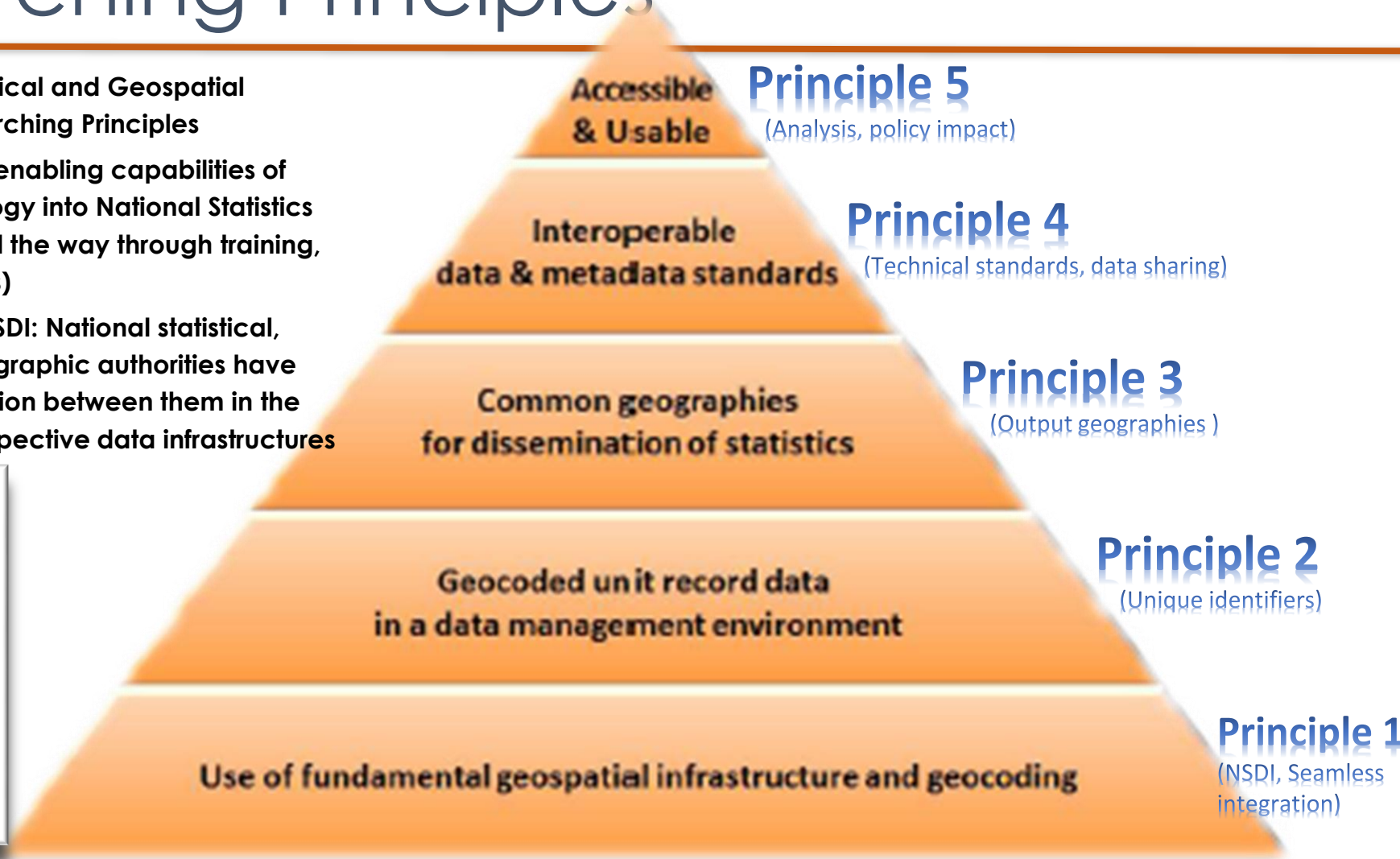
Demand for small geography data.
More frequent data.
Policy impact

Principle 4
(Technical standards, data sharing)

Interoperable data & metadata standards

ISO Standards
OGC Standards
Statistics Principles

Principle 3
(Output geographies)

Common geographies for dissemination of statistics

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

Principle 2
(Unique identifiers)

Geocoded unit record data in a data management environment

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

Principle 1
(NSDI, Seamless integration)

Use of fundamental geospatial infrastructure and geocoding

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: (1) Scale; (2) Policy; (3) Institutional; (4) Modelling.

- **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 harmonise 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 :) GSGF
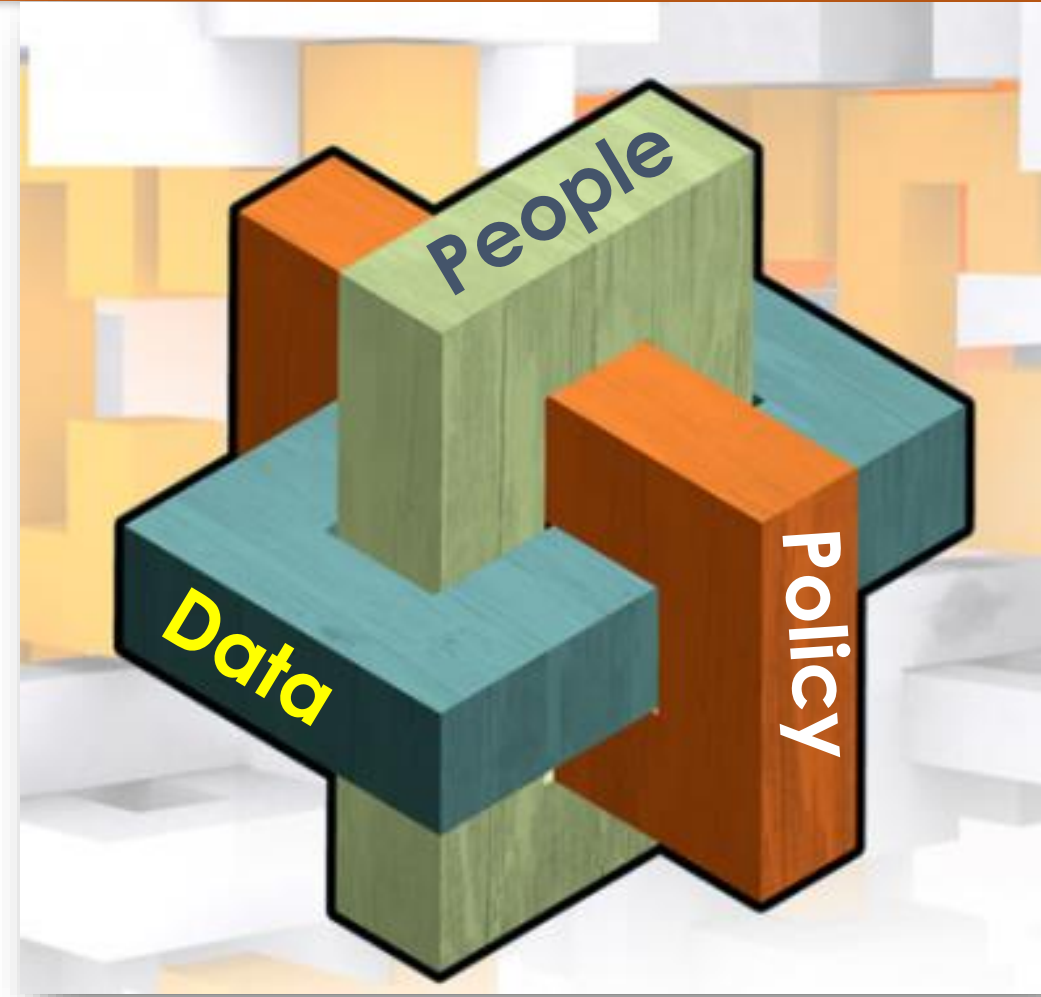
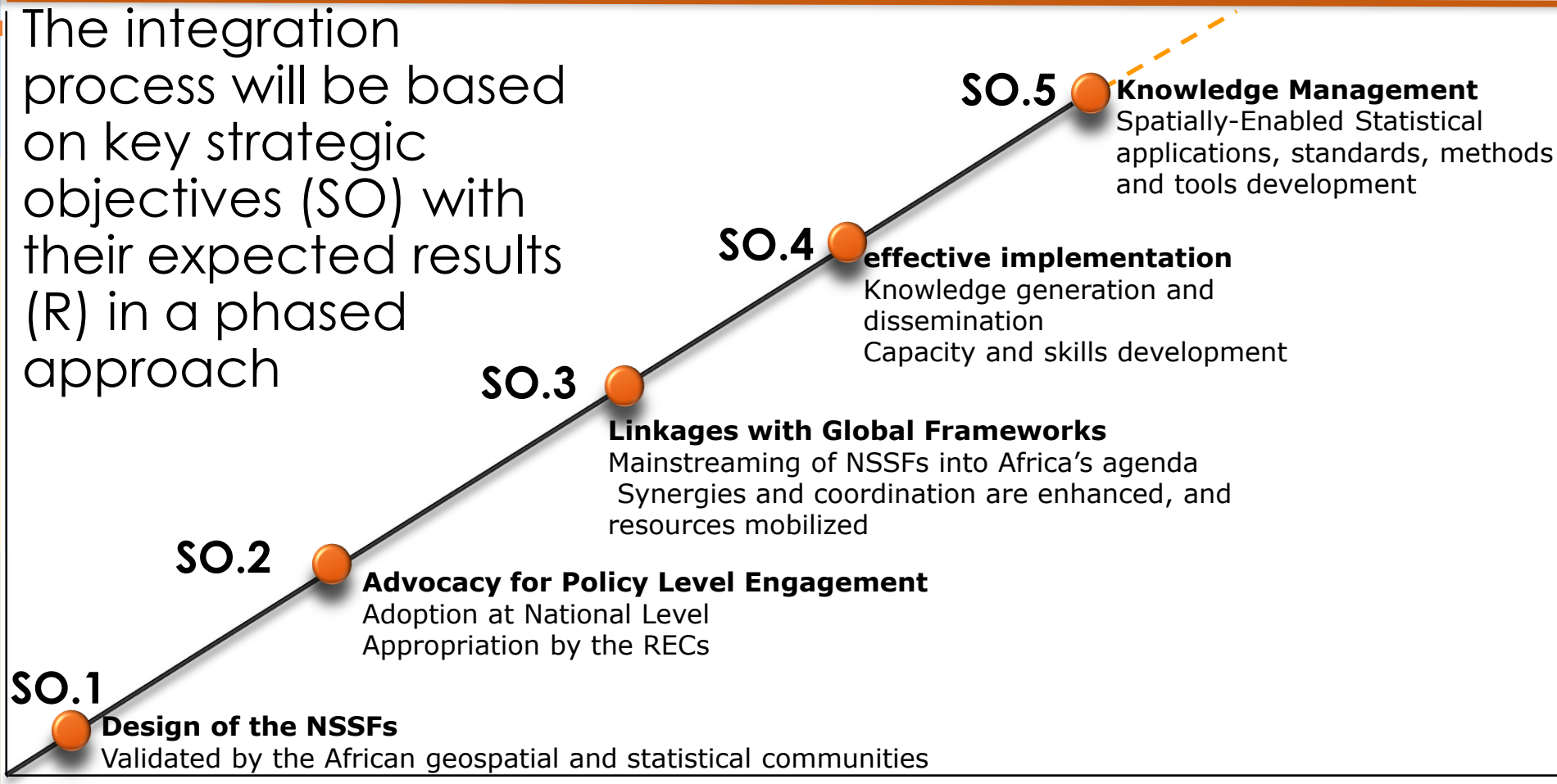# The African Statistical Spatial Framework: Downscaling into NSSF

■ The strategy includes a deconvolution mechanism to downscale the framework at national level, where Member States can adopt, adapt and apply their own National Statistical Spatial Framework (NSSF) based on the prevailing environment and realities in each country

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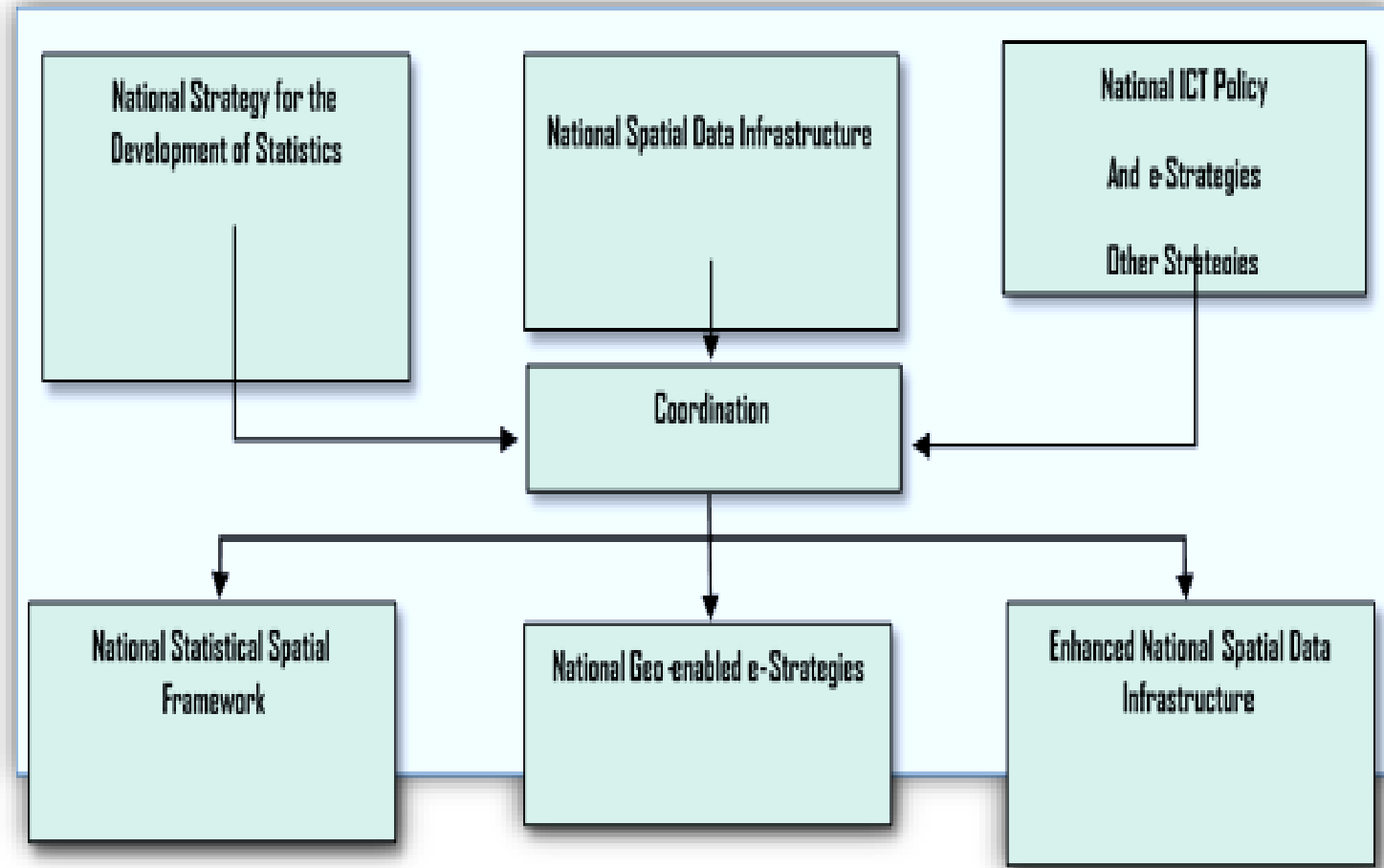
The African Statistical Spatial Framework: Strategic Objectives

- The integration process will be based on key strategic objectives (SO) with their expected results (R) in a phased approach

SO.5

Knowledge Management
Spatially-Enabled Statistical applications, standards, methods and tools development

SO.4

effective implementation
Knowledge generation and dissemination
Capacity and skills development

SO.3

Linkages with Global Frameworks
Mainstreaming of NSSFs into Africa's agenda
Synergies and coordination are enhanced, and resources mobilized

SO.2

Advocacy for Policy Level Engagement
Adoption at National Level
Appropriation by the RECs

SO.1

Design of the NSSFs
Validated by the African geospatial and statistical communities

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The African Statistical Spatial Framework: Quick Wins

- 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 frames

Adapted from G. Scott, 2015
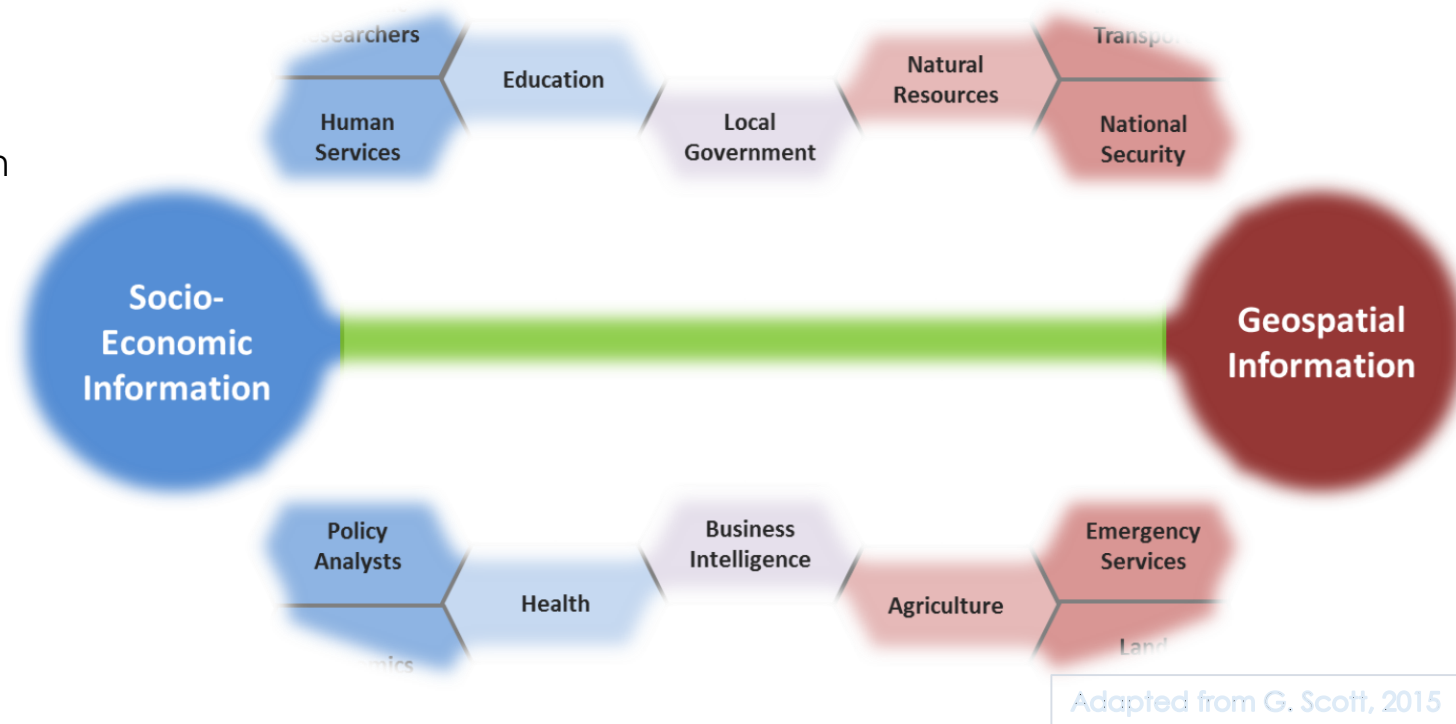
Concluding Remarks :
You cannot count what you cannot locate

- 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 (including standard and interoperability) in the creation, analysis and presentation of statistical data.

- Invariably, GIS have modified the way in which data from national statistics offices 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, clearly delineated enumeration area boundaries and a complimentary set of high-resolution satellite imagery.

- Geospatial analysis must become a core competency in any Census Office : Our aim is to mainstream geospatial information technology into national statistics offices activities in Africa, all the way through training, data and processes.

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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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