Integration of Geospatial and Statistical Information

The African Spatial Statistical Framework
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.
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).

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

- Aerial Photography: 37%
- Satellite Images: 65%
- GIS: 67%
- GPS: 67%

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

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

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

Seamless mosaic coverage of very large part of a territory and that can be used for census cartography and other analytical processes.
Use of geospatial technologies in censuses operations by African countries

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Maps showing the use of RS, GIS, and GPS in African countries. The maps are color-coded to indicate the use of technologies.
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

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
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

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 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.
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.1**: Design of the NSSFs
  - Validated by the African geospatial and statistical communities

- **SO.2**: Advocacy for Policy Level Engagement
  - Adoption at National Level
  - Appropriation by the RECs

- **SO.3**: Linkages with Global Frameworks
  - Mainstreaming of NSSFs into Africa’s agenda
  - Synergies and coordination are enhanced, and resources mobilized

- **SO.4**: Knowledge Management
  - Spatially-Enabled Statistical applications, standards, methods and tools development
  - Knowledge generation and dissemination
  - Capacity and skills development

- **SO.5**: Effective implementation
  - Synergies and coordination are enhanced, and resources mobilized

United Nations Economic Commission for Africa
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.
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”...