

The Expert Group on the Integration of Statistical and Geospatial Information

co-Chairs: currently vacant

- Composed of Experts in Statistical and Geospatial Integration from NSOs and NGIAs
- 29 Member States, 5 UN Regional Commissions, 3 UN Agencies and 4 International Organisations
- Reports to both the UN Statistical Commission and the UN Committee of Experts on Global Geospatial Information Management (UN-GGIM)



UN-GGIM
UNITED NATIONS
COMMITTEE OF EXPERTS ON
GLOBAL GEOSPATIAL
INFORMATION MANAGEMENT

PRINCIPLES

Accessible & usable

Statistical and geospatial interoperability

Common geographies for dissemination of statistics

Geocoded unit record data in a data management environment

Use of fundamental geospatial infrastructure and geocoding

KEY ELEMENTS

Standards and Good Practices

National Laws and Policy

Technical Infrastructure

Institutional Collaboration

INPUT

Geospatial

- Fundamental data
- Supplementary data
- New data sources

Statistical

- Censuses
- Surveys
- Administrative data records
- Big data and other sources

OUTPUT

Integration

Harmonised and standardised information

Interoperability
Comparability

Analysis

Diffusion

Decision making

Guided by the Global Statistical Geospatial Framework

The GSGF Implementation Guide

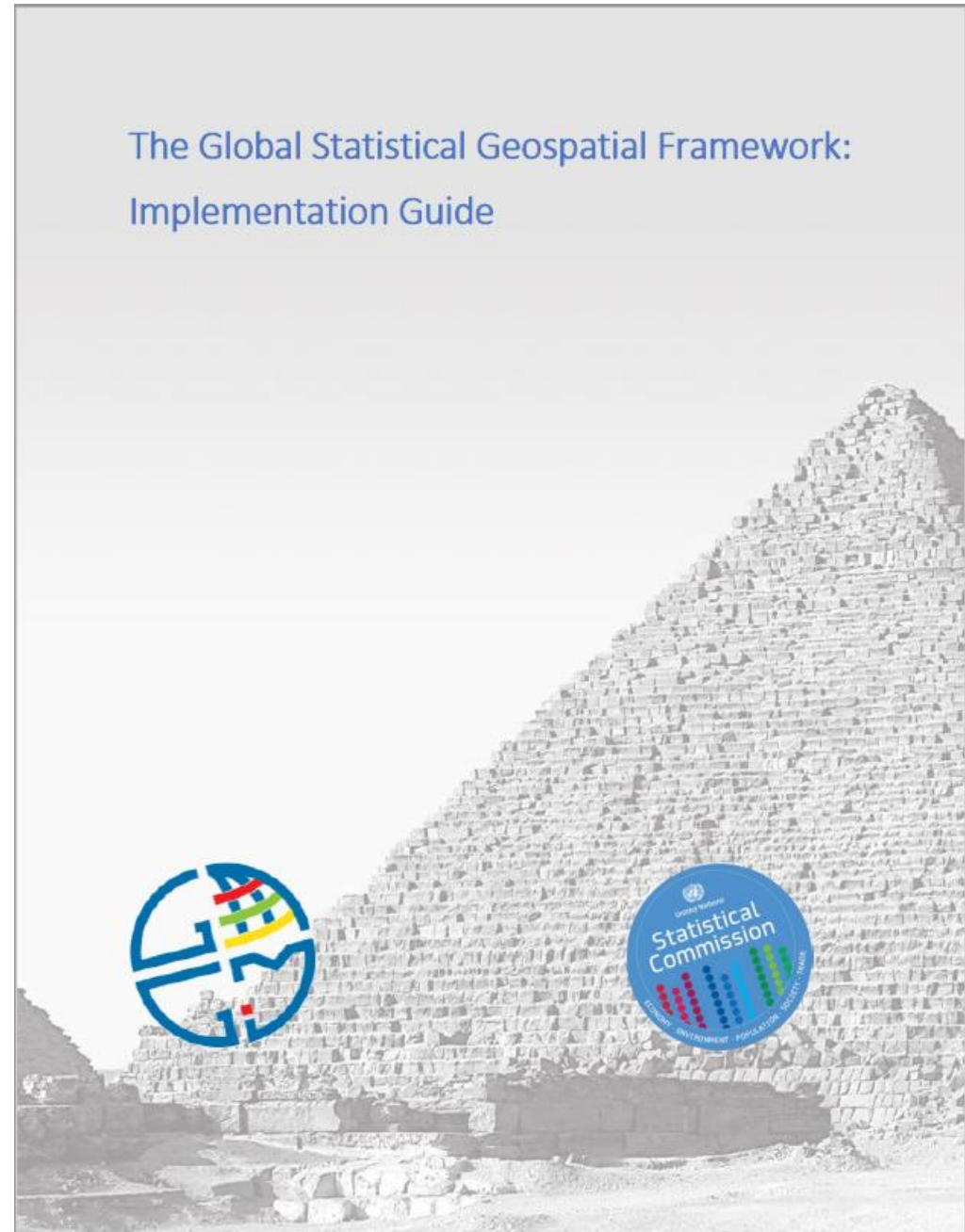
UNSC Decision 51/123:

"...welcomed [the Expert Group's] continuing efforts to provide guidance to Member States to support the adoption and implementation of the GSGF"

UN-GGIM Decision 9/106:

[Encouraged the Expert Group] "...to continue its work to develop guidance on and support the promotion, awareness-raising and implementation of the Framework, and its work on statistical geospatial integration and coordination, in particular with regard to the Sustainable Development Goals and the 2020 round of population censuses, and encouraged Member States and other stakeholders to participate in, and contribute to, these important elements"

The Global Statistical Geospatial Framework: Implementation Guide



The GSGF Implementation Guide

Document Structure

Guidance

Implementing Geocoding

Implementing Common Geographies

Fostering Interoperability

Ensuring Privacy and Confidentiality

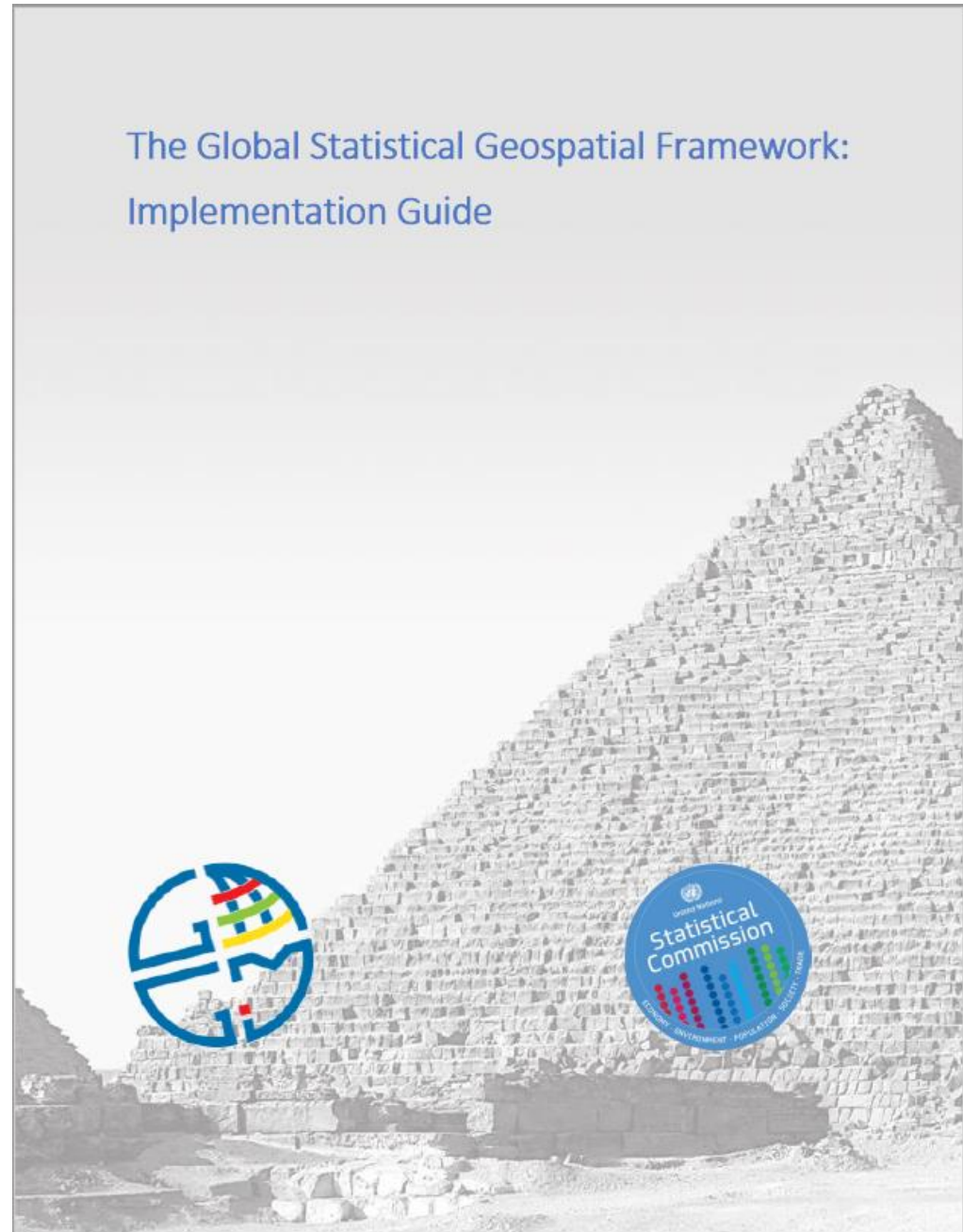
Terminology of the Integration of
Statistical and Geospatial Information

Experiences of Implementation

30 National Experiences

5 Regional Experiences

The Global Statistical Geospatial Framework: Implementation Guide

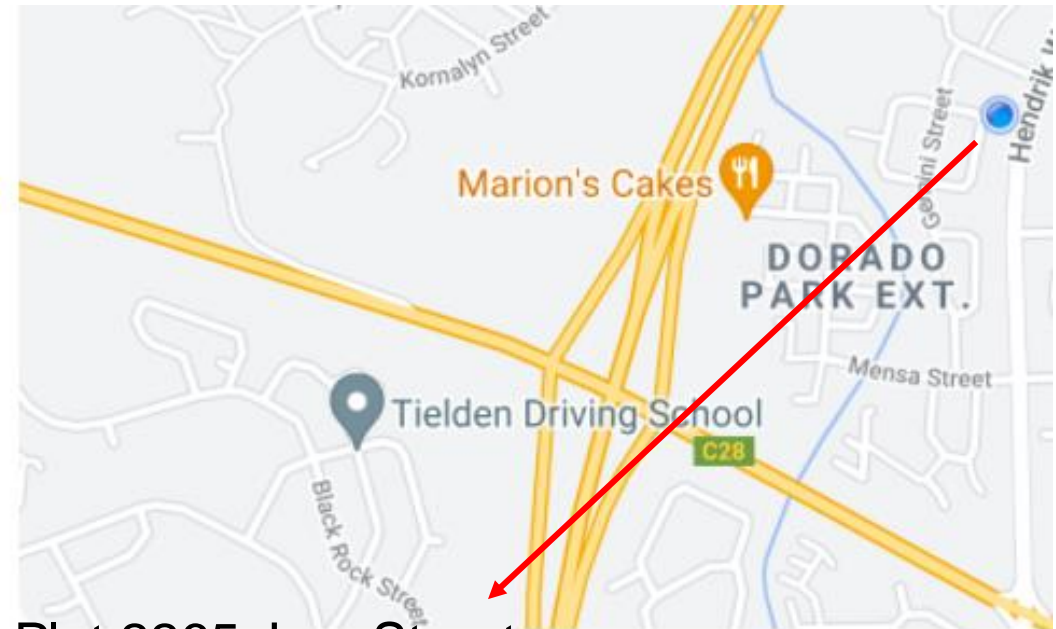


Implementing Geocoding

- Relevant Principles of the Global Statistical Geospatial Framework:
 - Principle 1: Use of fundamental geospatial infrastructure and geocoding
 - Principle 2: Geocoding unit record data in a data management environment
- But what is Geocoding?
 - Many prefer to use descriptions of locations instead of coordinates to navigate their environment.
 - An address instead of a coordinate.
 - Modern geospatial technologies depend on absolute position data coordinates within a specific reference system

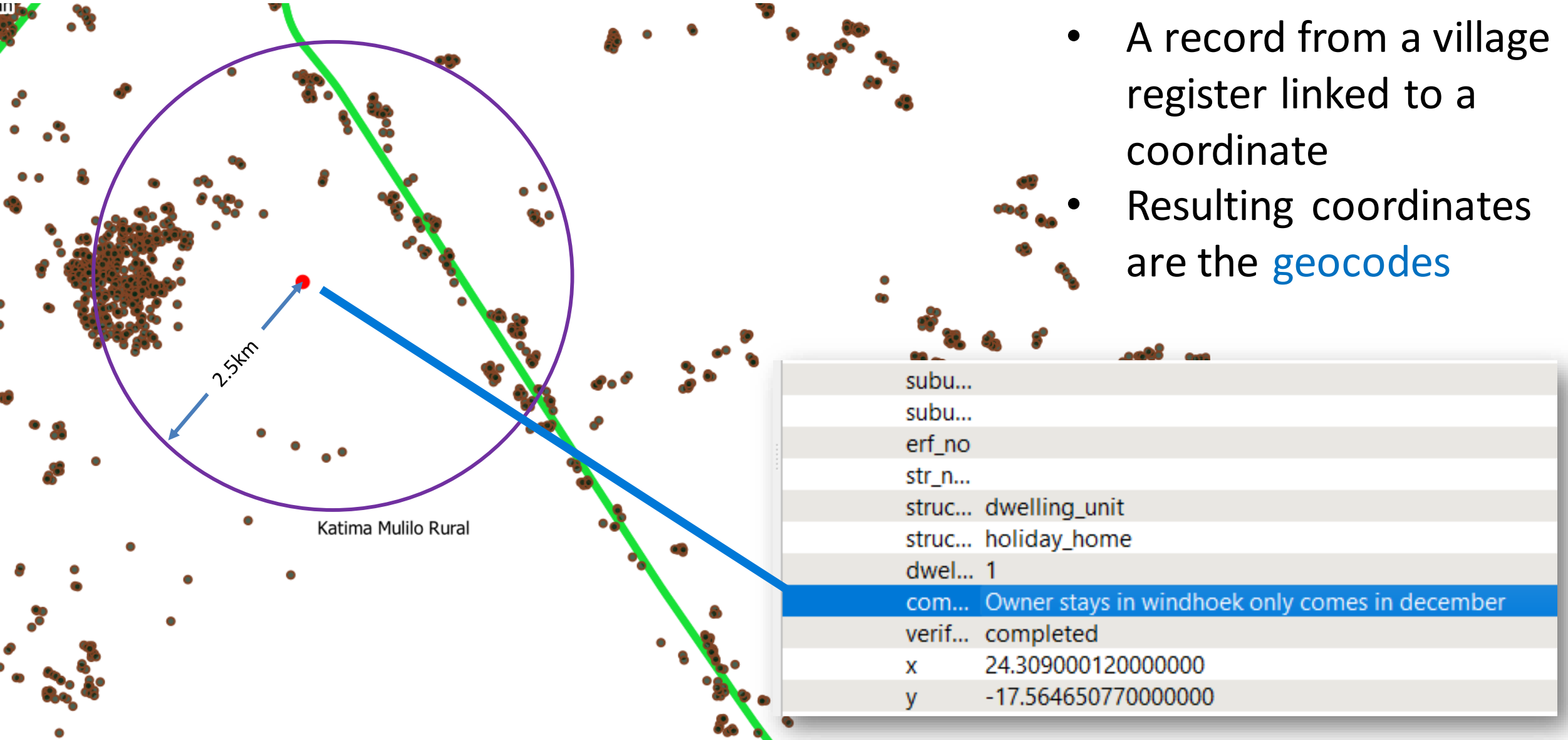
- **Geocoding**

- A method of *linking a description of a location to the location's measurable position in space.*
- Links unreferenced location information (e.g., **an address**, or **other location description**) associated with a statistical unit (e.g., **housing unit** or **business**) to a set of coordinates within a coordinate system.



Plot 2265, Leo Street
Dorado Park Ext.
Windhoek

Linking Statistics to Geography ...Example Housing Unit in Rural Namibia



- Formally stated:
 - “geocoding is generally defined as the process of **geospatially enabling statistical unit records** or **other nonspatial data** (such as address lists or housing unit records) by creating **x- and y- (and potentially z) coordinates** and **linking them to each record.**”
- Once geocoding is performed on individual statistical unit records:
 - can be **aggregated** into larger geographic units (e.g., states, provinces, or municipalities) for statistical analysis.
- Records ready for further applications such as methodologies to ensure ***confidentiality*** and ***avoid data disclosure***.

Why is Geocoding needed?

- To foster the greatest opportunity to **reuse** and **aggregate statistical data**.
 - **Aggregation** and **disaggregation** of associated statistical data by geospatial location becomes possible.
- GSGF states that:
 - *“all statistical unit records should include or be linked to a precise geographic reference (an x- and y- coordinate)*
 - *“If not, the smallest geographic area possible”.*
- Recommendation for using an x- and y- coordinate for geocoding first issued by the Expert Group in 2018 and is **reiterated again in 2021**.

How can records be geocoded?

- Modern geocoding processes are largely automated
 - Matching captured data with a reference database with some in-built spatial intelligence to improve the matching process.

- Efficiency of geocoding relies on:

1. A comprehensive reference database of addresses
2. Locations in x and y coordinates



This is a component of a mature national spatial infrastructure

- Geocoding also helped by having a standardised, structured description of a location.
 - A street address contains a number of specific elements with formatting requirements that are used in geocoding.

How can records be geocoded?

1. Geocodes can be generated **directly** (i.e., coordinates accepted as being specific for the statistical unit record);
2. Or **indirectly** when they use an internal point of a geographic area.
3. Conceptually the most accurate geocodes are the x- and y- coordinates assigned to a statistical unit record at time of collection.
4. Equally specific are geocodes assigned using specific **standardised structure IDs or even within structure IDs** (e.g., one apartment within an apartment building).
5. The next most specific geocodes are for **addresses** or **standardised parcel IDs**.

How can records be geocoded?

- Also geocodes can be generated using an **internal point** (e.g., a centroid) for any functional area
- Note:
 - *Geocoding must be **consistently documented** for each statistical unit record in a dataset along with a corresponding record of a time and date for each record when each record was geocoded.*

Example: Geocoded Household and Business Register inside Enumeration Areas (Direct Method)



Namibia Statistics Agency



Select by Region

Zambezi

Select by Constituency

Katima Mulilo Urban

Select by EA

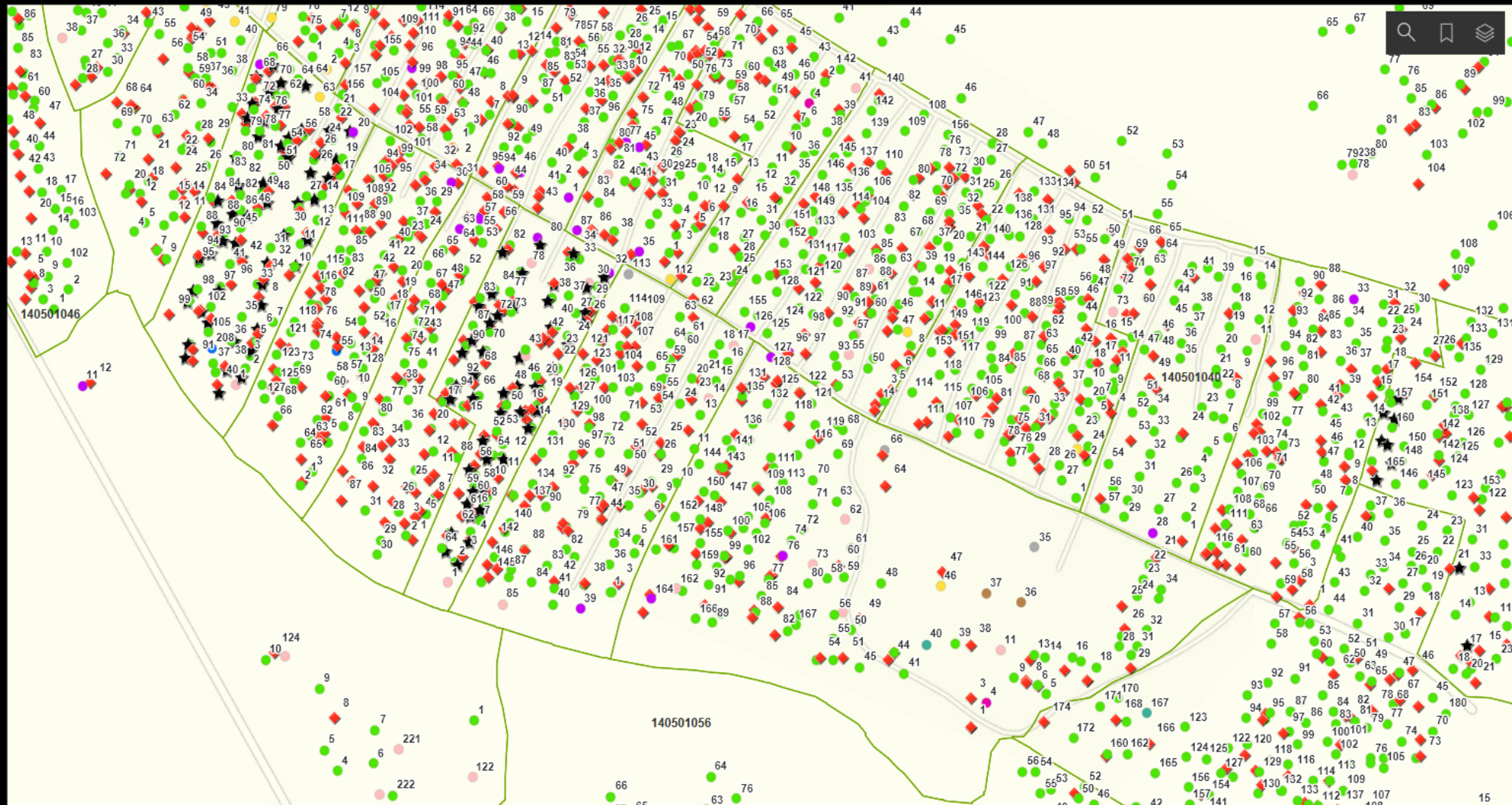
None

Assigned To

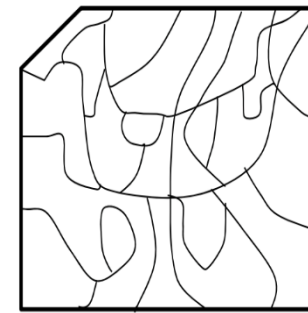
None

Select by Status

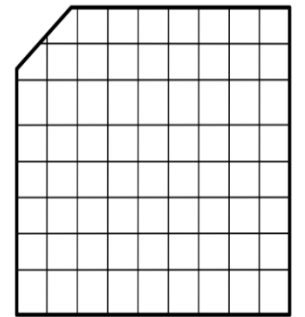
None



Implementing Common Geographies



Administrative Geographies



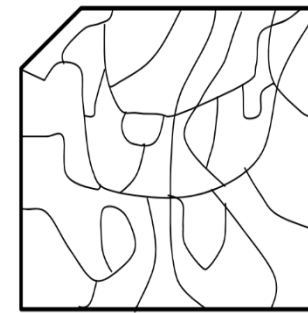
Statistical Geographies

Common geographies are an agreed set of geographic areas for the display, storage, reporting, and analysis of social, economic and environmental comparisons across statistical datasets from different sources. They enable the production and dissemination of integrated statistics and geospatial information within a country to support informed decision-making.

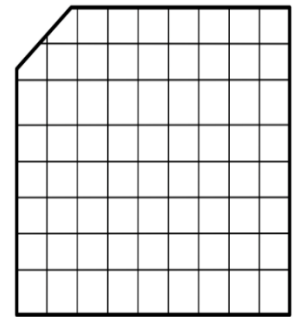
The broad types of *Common Geographies*:

- Geographies defined in law, regulations or constitution - examples include sub-national major political regions, electoral districts and local municipalities. This type of geographic area is often termed **administrative**.
- Geographies defined by a set of rules, or a methodology meant to represent a geographic concept such as metro regions, statistical grids and small area dissemination geographies. This type of geographic area is often termed **statistical or geo-statistical**.

Implementing Common Geographies



Administrative Geographies

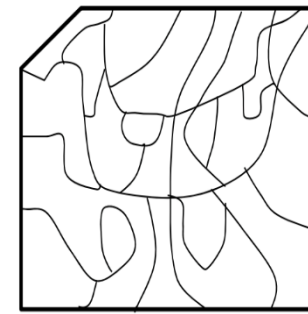


Statistical Geographies

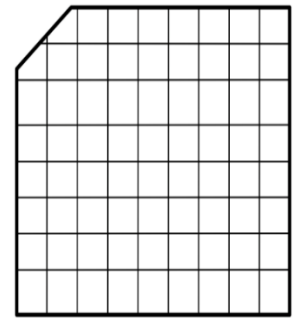
The GSGF encourages the adoption of common geographies. The following objectives may be attained:

- Enhanced capacity to produce aggregated data and indicators for domestic purposes and data users.
- To meet monitoring and reporting needs in support national objectives, and global and regional indicator frameworks (e.g. Population Censuses, 2030 Sustainable Development Goals).
- To address emergent and persistent challenges (COVID-19 pandemic, disasters) for countries, and regional and international agencies.

Principle 3 of the GSGF recognizes and acknowledges:



Administrative Geographies



Statistical Geographies

The continuing need for country-specific dissemination geographies.

- New or proposed common dissemination geographies should be viewed as congruent and adjunct to the existing geographies maintained by National Statistical Offices (NSOs), National Mapping Agencies (NMAs) and National Geospatial Information Authorities (NGIAs).
- The use of common geographies within the statistical production process ensures that statistical data is geospatially enabled whether in gridded form or using administrative or statistical boundaries; and to build and sustain capacity in the form of methodologies that enable the transformation of geospatially enabled statistics amongst administrative, statistical and gridded geographies.
- The nature of common geographies means that there can be many stakeholders involved in their production, analysis or use by NSO, NGIAs, international and regional organisations and other institutions (e.g. NGOs, the Open Geospatial Consortium (OGC) and the private sector etc.).

Enabling Resources

- 14 Global Fundamental Geospatial Data Themes
- 14 Themes considered fundamental to strengthening a national geospatial infrastructure
- Specific to geocoding are:



x- and y- coordinates

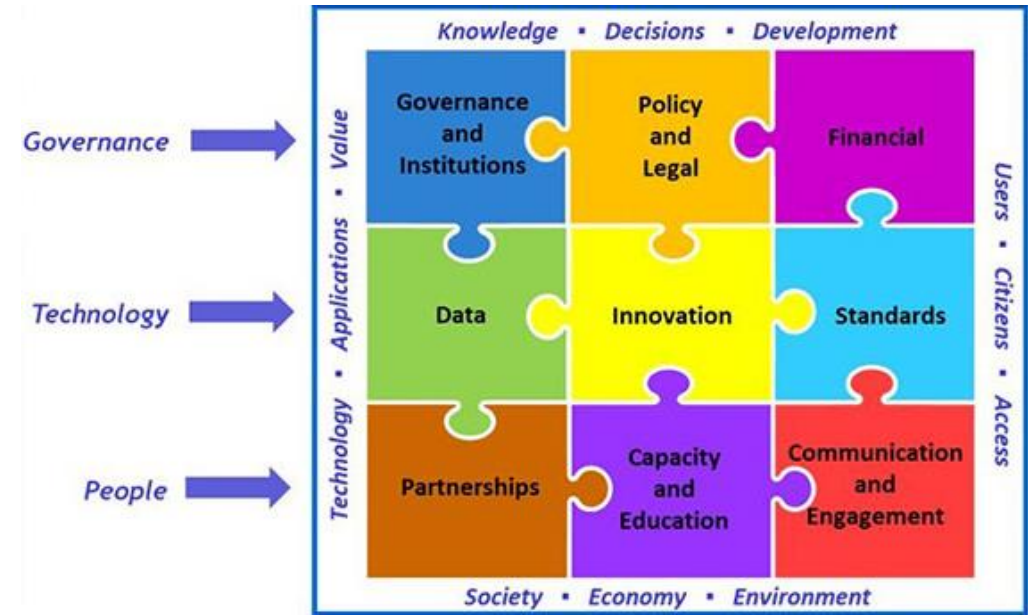


Addresses



Functional Areas

Global Geodetic Reference Frame (x- and y- coordinates), Addresses, and Functional Areas are directly relevant to geocode statistical unit records.



The Integrated Geospatial Information Framework

- 9 Strategic Pathways
- Supported by implementation guides and other resources
- More at igif.un.org