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X SESSION UN-GGIM: AMERICAS

October 18, 19 and 20 - 2023
Santiago de Chile, ECLAC

Why do we need to integrate geospatial and Statistical Information?

Claudio Stenner, Director of Geosciences, IBGE, Brazil and co-Chair Expert Group on the Integration of Statistical and Geospatial Information (UN EG-ISGI)

The UN Expert Group on the Integration of Statistical and Geospatial Information

Led by Brazil and Ireland

10th anniversary

UN·EG-ISGI

UNITED NATIONS • EXPERT GROUP ON THE INTEGRATION OF STATISTICAL AND GEOSPATIAL INFORMATION

The EG-ISGI was formed a decade ago and we look forward to celebrating this milestone with you over the coming year!

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The UN Expert Group on the Integration of Statistical and Geospatial Information
Led by Brazil and Ireland

Composed of Member State nominated Experts from both National Statistical and Geospatial Information Agencies, the Expert Group:

- Provides **high-level coordination** and a forum for dialogue, among representatives of both the statistical and geospatial communities, on global efforts relating to the **integration of statistical and geospatial information**;

- Plays a leadership role by raising awareness and highlighting the importance of **reliable, timely, fit-for-purpose, and integrated statistical and geospatial information** to **support social, economic, environmental, and resilience policy decision making,** including at the sub-national and regional levels;

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The UN Expert Group on the Integration of Statistical and Geospatial Information
Led by Brazil and Ireland

- Prioritizes and propose work plans and guidelines that **advance national and global efforts** relating to the **integration** of statistical and geospatial information, particularly those associated with the **Global Statistical Geospatial Framework (GSGF)**, so that there is increased information to support social, economic, environmental, and resilience policy decision making, including at the sub-national and regional levels;

- Promotes and support activities that facilitate the implementation of the GSGF, particularly in the **International Rounds of Population Censuses and in other censuses**, including agriculture censuses, economic censuses, etc., and in global initiatives, such as the **2030 Agenda**; and,

- Supports the **United Nations Statistical Commission and UN-GGIM** in the development of **norms, principles, guides and standards** to increase significantly the availability of high-quality, timely and reliable integrated statistical and geospatial information, including any regional capacity development initiatives.

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COORDINATION ACTIVITIES - 2023

- **United Nations Statistical Commission - 54th Session – 2023**
  Side Event - **Event Geo-statistical Integration - The Global Statistical Geospatial Framework (GSGF) and Beyond**
  Side Event – **The integration of statistics and geospatial information in the Community of Portuguese Language Countries (CPLP) – promote by Brazil.**

- **13th Session of the United Nations Committee of Experts on Global Geospatial Information Management (UN-GGIM) – 2023**
  Side Event - **Geospatial Information and Statistics and its integration for the Sustainable Development Goals**

- **Global Webinar on Strengthening Climate Change and Disaster-Related Statistics**: **Needs, Priorities, and Action**
  4th and 10th, May, 2023 – UN Environmental Programme and ESCAP

- **High-level seminar on integration of geospatial and statistical information (Upcoming)**
  28 to 30 November 2023, Bangkok, Thailand - ESCAP, UN-GGIM, UNSD and Statistics Norway

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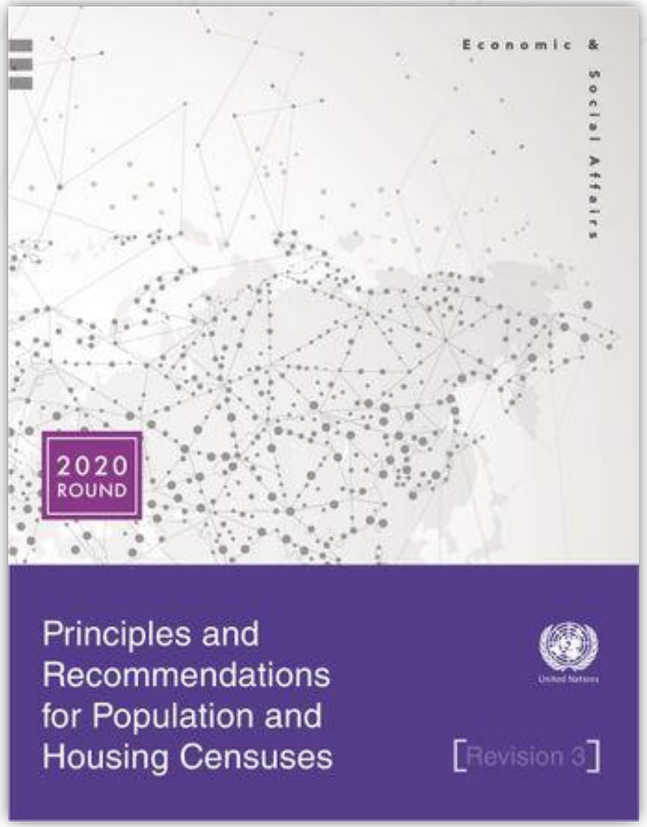
COORDINATION ACTIVITIES - 2023

The revision of the Principles and Recommendations for Population and Housing Censuses

Task Team 3: Use of geospatial information in census operations



- review and redraft relevant sections of chapters IV and X of part III to **incorporate recent developments in conducting a geospatially integrated census**
- introduce the **GSGF and the IGIF** and other relevant international initiatives with a view to providing recommendations on how to adopt recent international guidelines into census operations
- address the importance of the **national spatial data infrastructure (NSDI)** in providing a common base map (ground-verified, field-corrected and continuously updated) to avoid the cost of duplicative efforts
- address **the use of geospatial information from the perspective of enterprise geospatial data management**, and not from the perspective of use of desktop GIS, satellite imageries and GNSS, which are no longer challenges for most NSOs
- address the concerns of **disclosure of confidential information** in the context of dissemination of census data integrated with geospatial information

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COORDINATION ACTIVITIES - 2023

The revision of the Principles and Recommendations for Population and Housing Censuses

Task Team 3: Use of geospatial information in census operations

- address the **relevance and use of geospatial information** in the **planning and implementation** of each stage of the **census operation** (e.g., planning, organization and management of census operations, for logistics management, optimizing workloads and routes of enumerators, monitoring enumeration, analysis, dissemination, etc.)

- address the importance of the **integration of geospatial information and census data**, with a view to **improving the usefulness of census data for policy- and decision-making** as well as **global comparisons**, and promote the dissemination of **geocoded census** data, including **grid-based census outputs**

- address the **integration of geospatial information with administrative records and registers**, including address registers and/or **registers of buildings/dwellings**

- discuss what factors to take into consideration when **evaluating the quality of geospatial information used in the census**, including some of the **dimensions of quality** (such as relevance, accuracy, timeliness, etc.) that can be used to assess the quality of geospatial information used in census operations

TT3 Members from Americas: Brazil, Colombia, USA, Academic Network of the Americas and ECLAC/CELADE.

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COORDINATION ACTIVITIES - 2023

United Nations Committee of Experts on Business and Trade Statistics Statistical Business Register Task Team

- There is already a draft about Statistical Business Registers and Geospatial Information;
- The Task team on Statistical Business Registers of the UNCEBTS and the EG-ISGI are working together on a report on the integration of geospatial information in the SBRs is intended to be presented to the UNSC in 2024.

SDG – Working Group of Geospatial Information – IAEG

- GSGF was already included in SDG Geospatial RoadMap (2021)

COORDINATION ACTIVITIES - 2023

UN Committee of Experts on Big Data and Data Science for Official Statistics

- **UN Datathon** – Festival de Datos - Uruguay – 2023 – Statistics and Geospatial Integration is part of preparation of UN Datathon;
    - **Global Training Webinar** - **Integration of Geospatial Information and Statistics for the SDGs in the context of Big Data** – Webinar - October 4th, 2023 – with audience of **369** people from all over the world.

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COORDINATION ACTIVITIES -2023

- **Regional Webinar – UN-GGIM:Américas and ECLAC**
  The Five Principles of Global Statistical and Geospatial Framework – GSGF: Principle 1
  29th September 2023

- **UNECE, Eurostat, UN-GGIM Europe**
  Workshop on Integrating Statistical and Geospatial Data
  4-5 October 2023, Belgrade, Serbia

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GSGF Review
Led by the United States of America and the United Kingdom

UPDATE FOR 2030 ROUND OF CENSUSES

ADD GUIDANCE FOR ADDITIONAL IMPLEMENTATION GUIDE TOPICS

REFRESH THE DOCUMENT

Develop — **Topic overview**

Elaborate — **Scoping paper**

Update — **GSGF Implementation Guide**

Writing currently ongoing
Aiming for **March 2025** for submission to UNSC

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GSGF Review
Led by the United States of America and the United Kingdom

GSGF Review and Revision

- USA has begun editorial review

Associating topics with editors

- USA – Grids
- UK – User Defined Areas
- Canada/EC – Degree of Urbanization
- Brazil – Big Data
- ? - APIs/SDMX/Metadata Standards

- Define the topic
- Identify relevant Principles of the GSGF
- Establish the value - why is this important?
- How can this be implemented?
- Case Studies
- Further References

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Implementing the Integrated Geospatial Information Framework for the Statistical Domain

Led by Canada and Mexico

High-level concept of this discussion paper – the intent

The paper is intended to inform the statistical community of the strategic and flexible guidance the UN-IGIF provides to strengthen national management frameworks for integrated statistics and geospatial information.

Countries are urged to implement and operationalize the UN-IGIF and establish new or strengthen existing national integrated geospatial information frameworks that supports national priorities and commitments and emerging challenges for which NSOs are critical in providing fact-based data.

The document is organized into four main sections

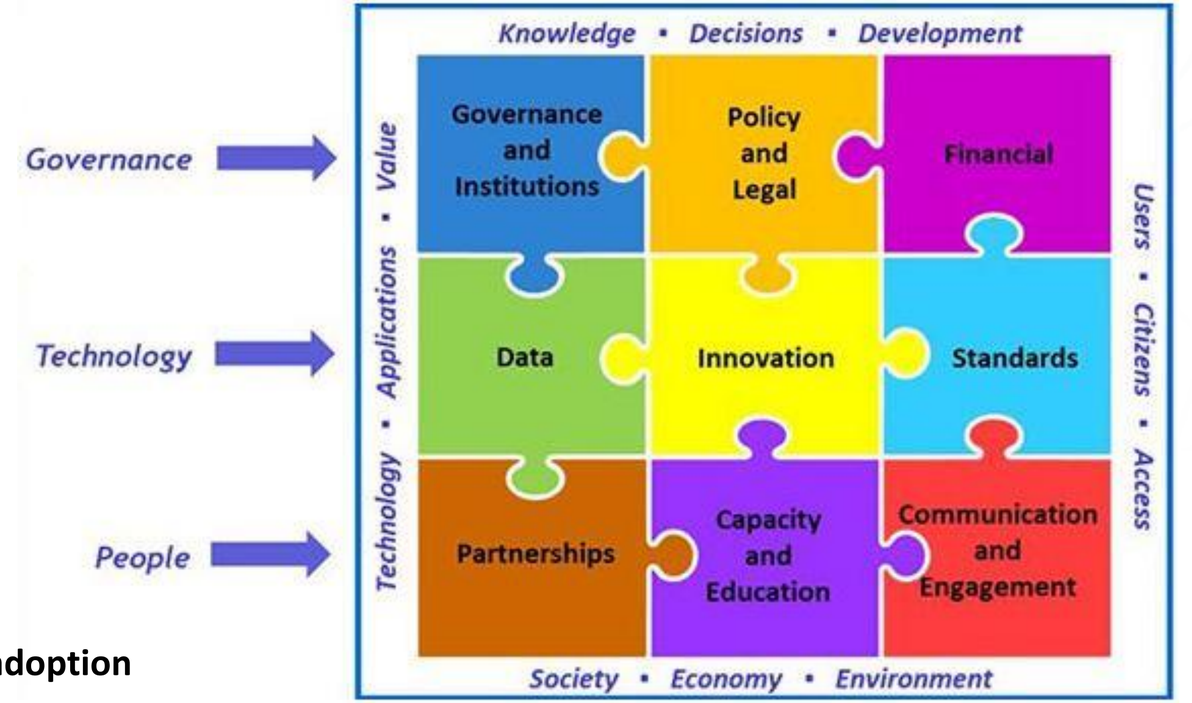
- Introduction
- Short descriptions of the nine (9) Strategic Pathways of the UN-IGIF
- Summary
- National Experiences / Case Studies

Provisional Timeline and Milestones

Now Expert Group review and refinement

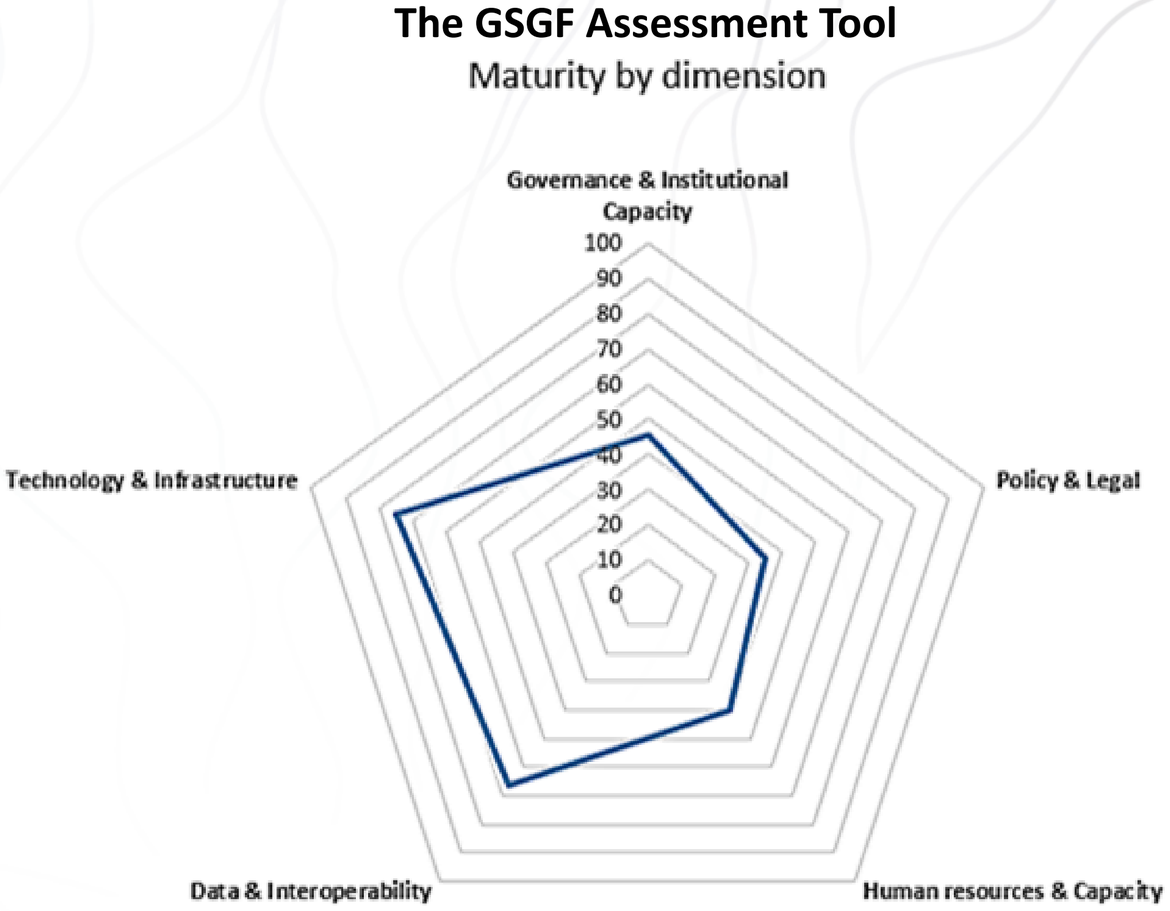
March 2024 Global consultation initiated

March 2025 56th Meeting of the UN Statistical Commission – submission for adoption



The GSGF Assessment Tool and the High-Level Seminar on Geo-Statistical Integration

Led by Norway and Sweden



- The majority of the questions within the **GSGF Assessment Tool** are drawn from the **World Bank Baseline Assessment Diagnostic Template for the UN-IGIF**.
- Questions have been modified slightly to fit the more specific purpose of assessing statistical-geospatial data integration.
- The logical structure of the template also, to a large extent, builds on the World Bank tool
- Four dimensions:
  - Governance & Institutional Capacity
  - Human resources & Capacity
  - Data & Interoperability
  - Technology & Infrastructure
- Some 30+ questions including scoring guides
- Data audit sheet (**Fundamental Geospatial Data**)

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The GSGF Assessment Tool and the High-Level Seminar on Geo-Statistical Integration

Led by Norway and Sweden

The High-Level Seminar on Geo-Statistical Integration

Statistics Norway has funded UNSD's "Data4Now" initiative for a few years – supporting capacity development in Kyrgyzstan, Burundi and other countries

Through this relationship, Statistics Norway has provided UNSD with the means to convene a global high-level seminar for NSOs and providers of authoritative geospatial data

- **Aim:** To equip Member States with the necessary skills to ensure continuous production and disaggregation of geospatially enabled statistical data.
  - Management/high-level participation, key decision-makers within the NSS and NGIA (in-person only)
  - Institutional focus but on a practical level
- **When:** November 28 – 30, 2023
- **Venue:** ESCAP – Bangkok

- Countries (tbc): Sierra Leone, Senegal, Ethiopia, Morocco, Tunisia, Zambia, Kenya, Namibia, Mozambique, Bangladesh, Kyrgyzstan, Vietnam, Palestine, Jordan, Vanuatu, Indonesia, Maldives, Uzbekistan, Mongolia, Lao PDR, Malaysia
- Funding: UNSD, ESCAP and Statistics Norway
- With the support of a consultant to support the development of the GSGF Assessment Tool

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The Global Statistical Geospatial Framework - GSGF

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What is the Data We Need:
The Global Fundamental Geospatial Data Themes

Global Geodetic Reference Frame

Addresses

Buildings and Settlements

Elevation and Depth

Functional Areas

Geographical Names

Geology and Soils

Land Cover and Use

Land Parcels

Orthoimagery

Physical Infrastructure

Population Distribution

Transport Networks

Water

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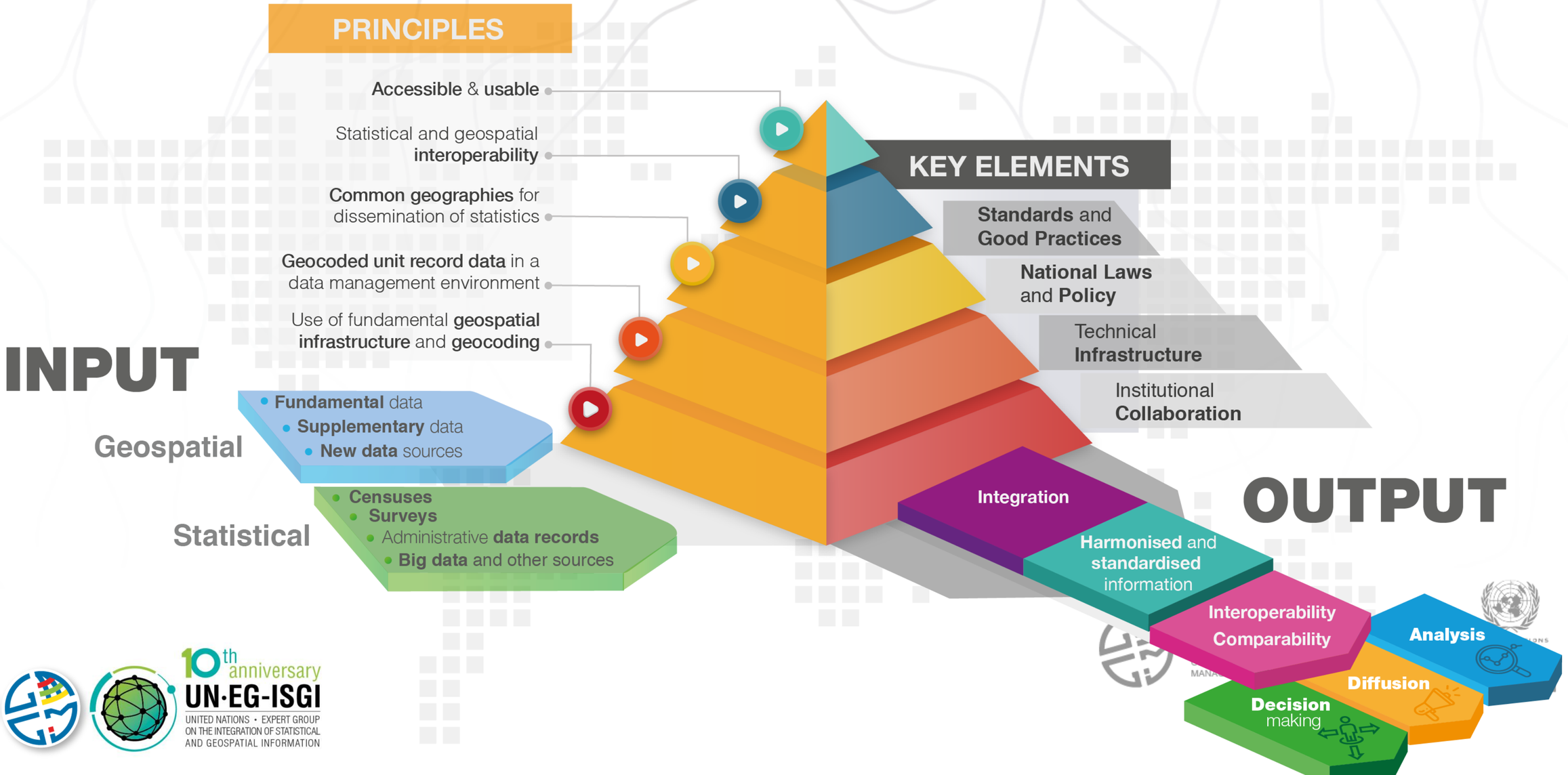
THE GLOBAL STATISTICAL GEOSPATIAL FRAMEWORK



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GUIDANCE TO IMPLEMENT THE GSGF

Translations of the GSGF

- *Arabic, Chinese, English, French, Portuguese and Spanish have been finalized, the EG-ISGI thanks:*
  - *China (Chinese – Mandarin), Canada and UNECA (French) Mexico, ECLAC and others (Spanish), Brazil (Portuguese), Kuwait (Arabic)*

The GSGF Implementation Guide

- *The GSGF Implementation Guide has been endorsed by both the Statistical Commission and UN-GGIM*

National and Regional Experiences of Implementing the GSGF

- Experiences of how the GSGF is implemented by 29 Member States and 2 Regional Commissions, including how it has assisted the response to COVID-19.

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Why Integration of statistical and geospatial information is important?

- To save money
- To improve life quality
- To save lifes

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The Global Statistical Geospatial Framework - GSGF

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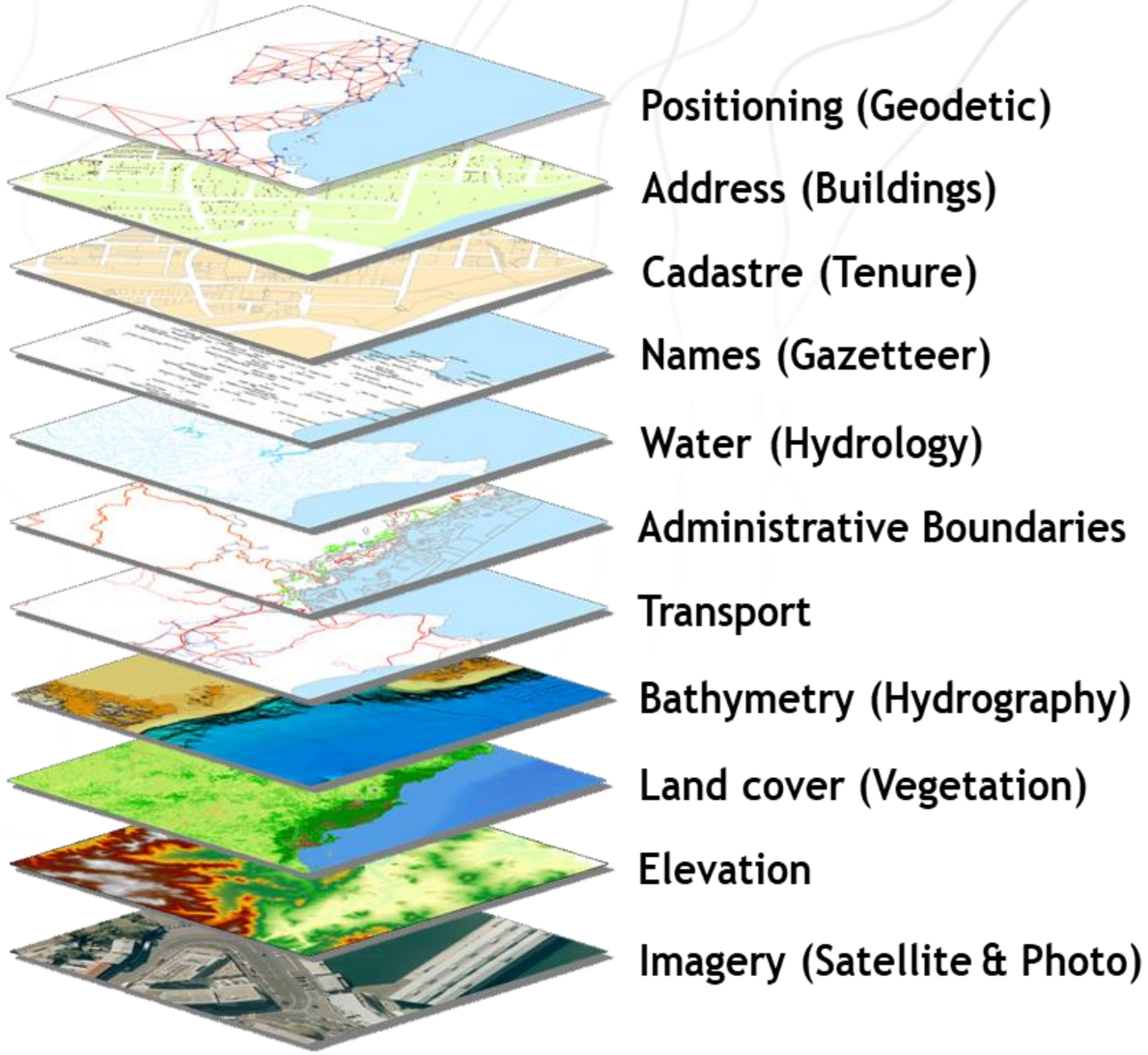
SOME ADVANTAGES OF INTEGRATED DATA

Facilitates the integration of statistical and geospatial information from different sources



Different information, statistics and geospatial, can be analyzed together, improving the understanding of the studied phenomena

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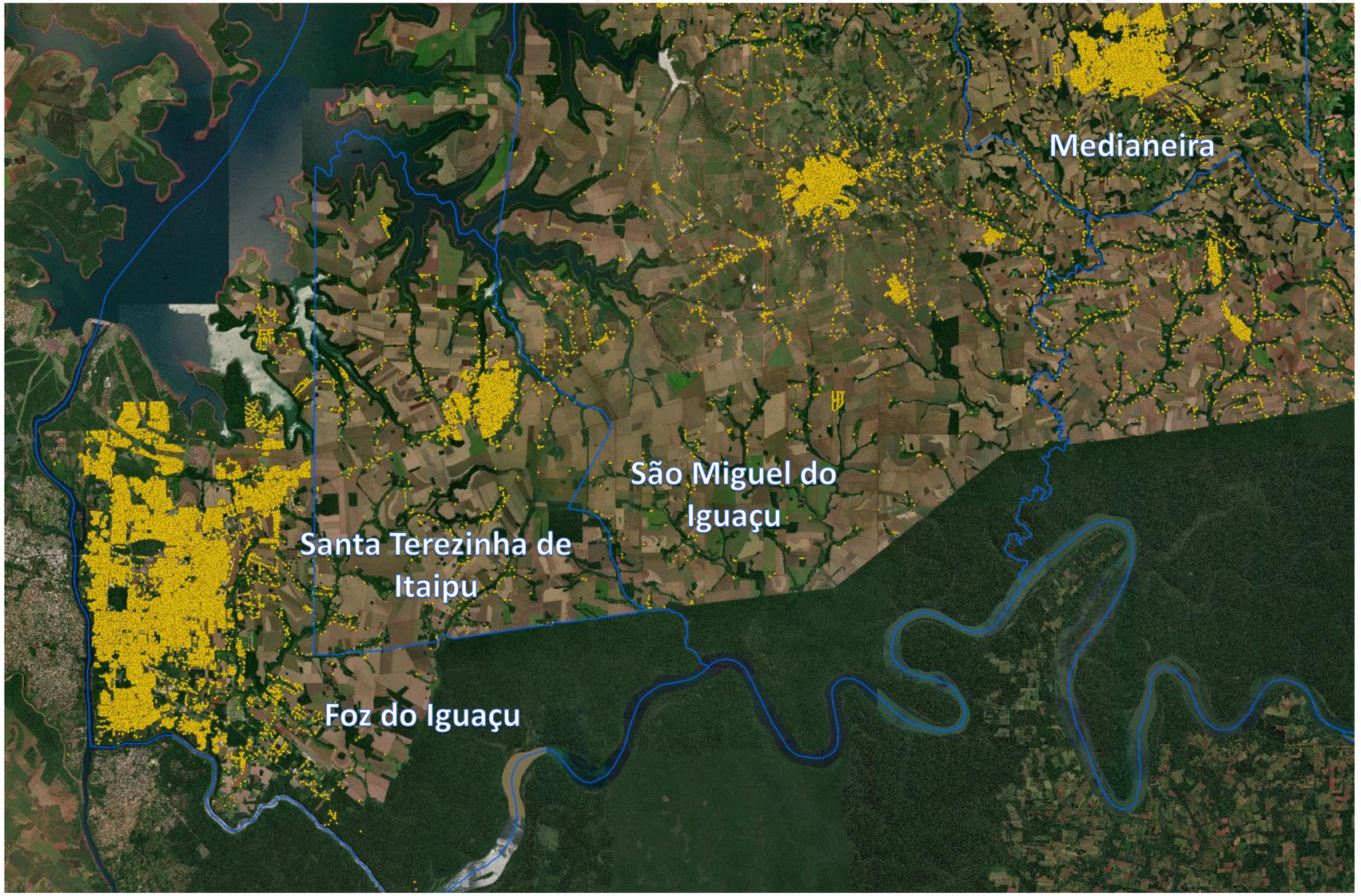
SOME ADVANTAGES OF INTEGRATED DATA

Provides a more accurate view of the distribution of people, households and human and natural phenomena in the territory, improving the allocation of human and financial resources



Distribution of households in Foz do Iguaçu and surrounding areas, Brazil. It is possible to observe the urban concentration in Foz do Iguaçu and other cities along the highway, as well as the rural population spread throughout properties in the river valleys. Also notable are the Iguaçu National Park and the Itaipú hydroelectric dam.

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Source: IBGE, Brazil.

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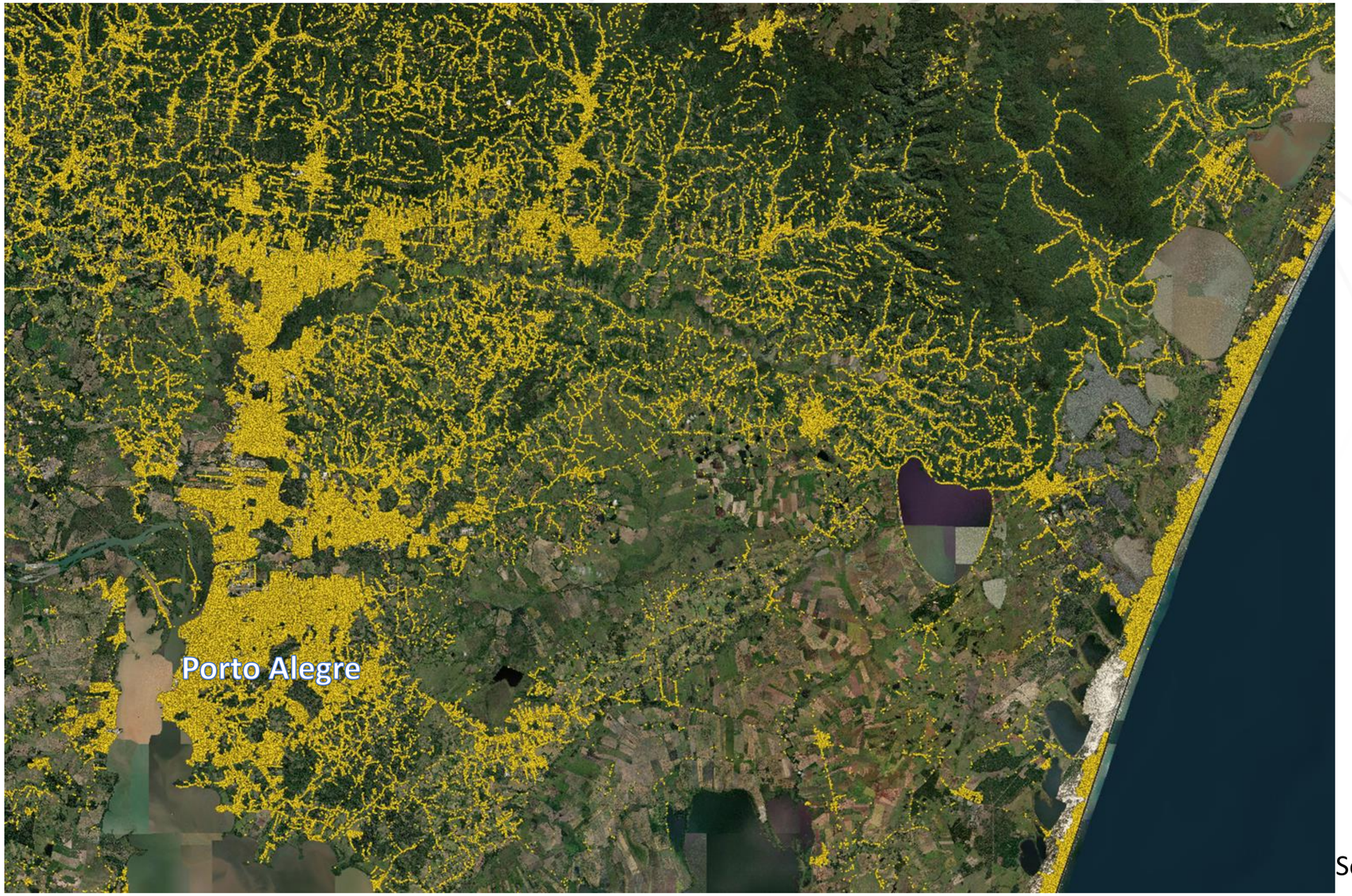

Distribution of households in Porto Alegre and surrounding areas, Brazil. The rural area surrounding Porto Alegre has a high density of rural occupation on small properties. It is also possible to identify summer occupation on the coast.

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Source: IBGE, Brazil.

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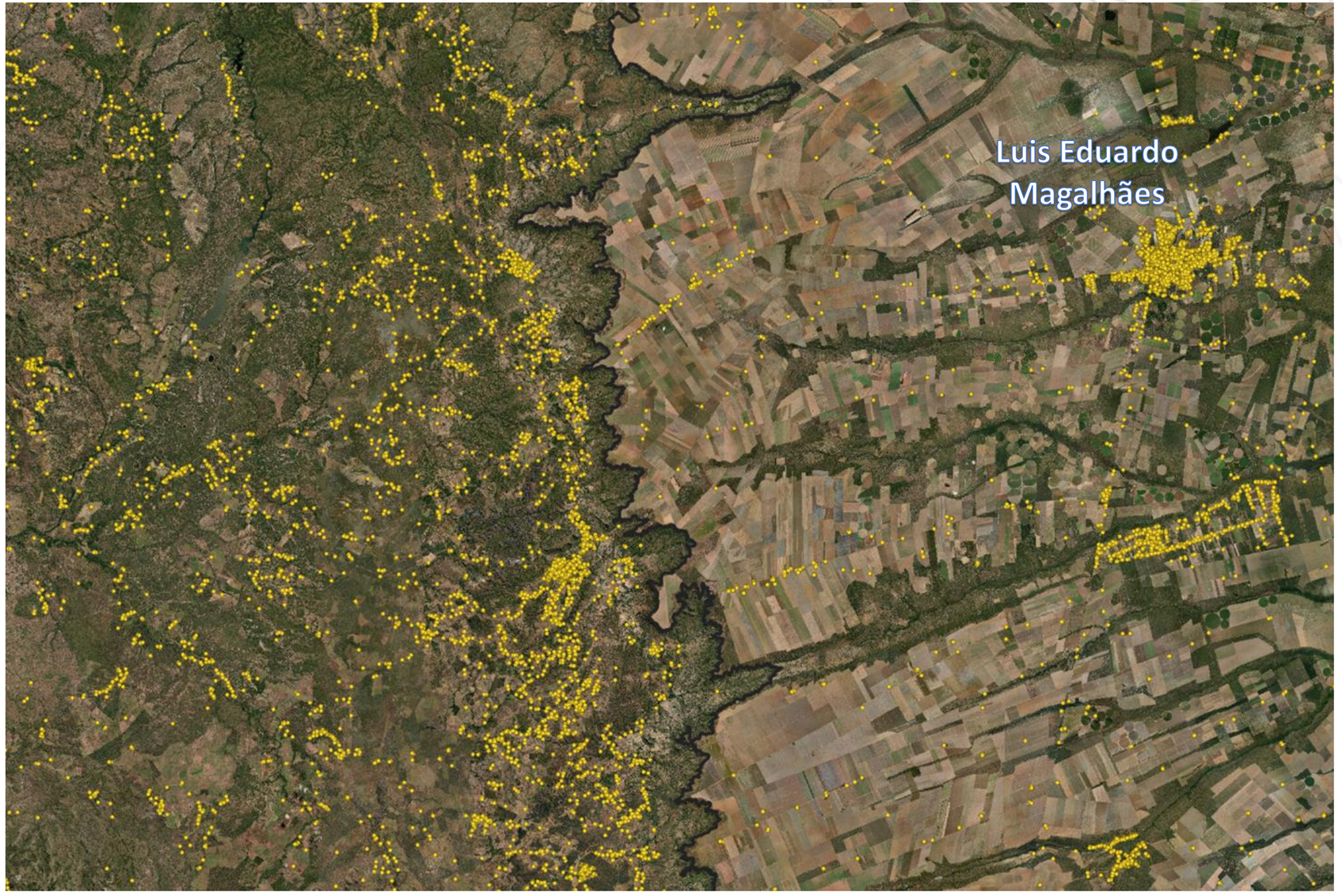

Distribution of households in Luís Eduardo Magalhães and surrounding areas, Brazil. This area is a large-scale soybean producer, on large mechanized properties. The rural population density is very low. On the other side of the escarpment, the density of rural occupation is significantly higher.

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Source: IBGE, Brazil.

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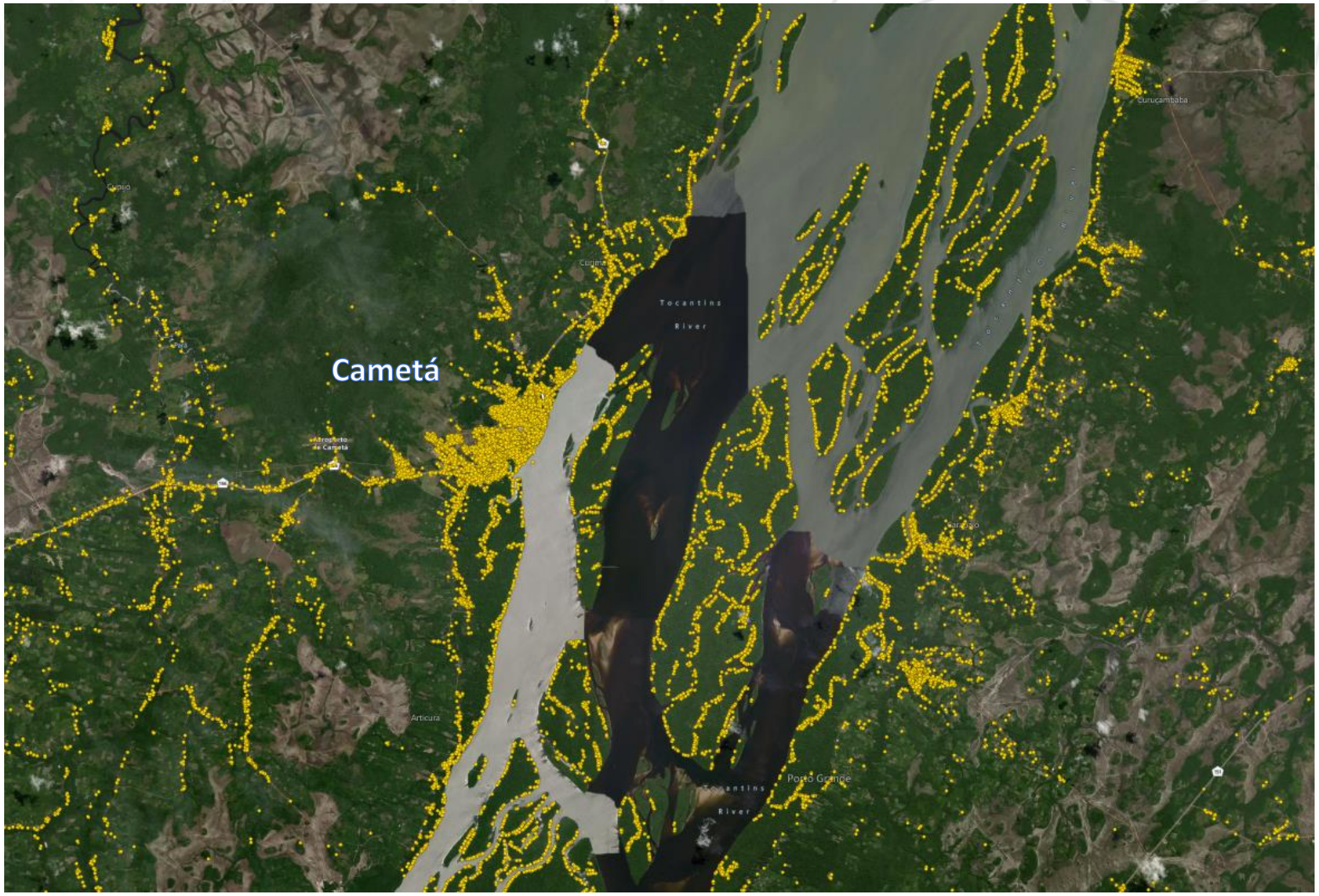

Distribution of households in Cametá and surrounding areas, state fo Pará, Brazil. It is possible to identify the **riverside population** on the islands in the Tocantins River and in the streams inside the islands

Source: IBGE, Brazil.

SOME ADVANTAGES OF INTEGRATED DATA

Improves the quality of statistical data, through planning and supervision of field operations

By **capturing coordinates** during a census operation, it is much easier to identify the parts of the city that have **already been visited** by enumerators and thus **correct possible omissions**.

Source: IBGE, Brazil.

SOME ADVANTAGES OF INTEGRATED DATA

Improves the quality of statistical data, through planning and supervision of field operations

It is possible to compare the **information collected** in the field with **administrative records**, and thus guarantee coverage of the operation. In **blue**, addresses provided by electricity companies through the national electricity agency. In **yellow**, the households visited by the **2022 Census** (Brazil).

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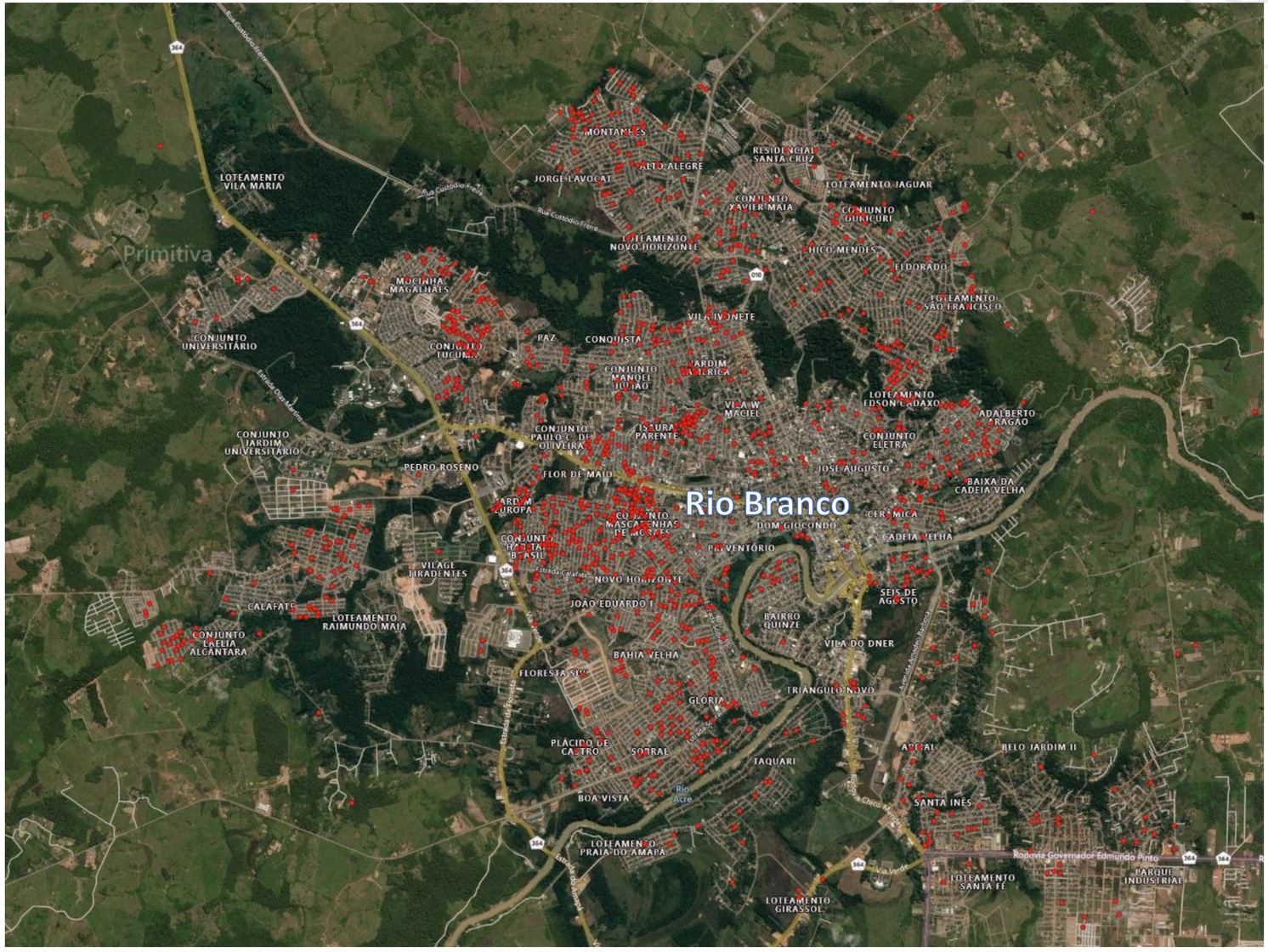
Source: IBGE, Brazil.

SOME ADVANTAGES OF INTEGRATED DATA

Improves the quality of statistical data, through planning and supervision of field operations



On this map it is possible to see the households (**red** dots) that **refused to receive enumerators**, in the city of Rio Branco, state of Acre, Brazil. This information was available in **real time** during the census operation, enabling the **development of strategies** that significantly **reduced the percentage of households that refused to respond** to the 2022 Census.

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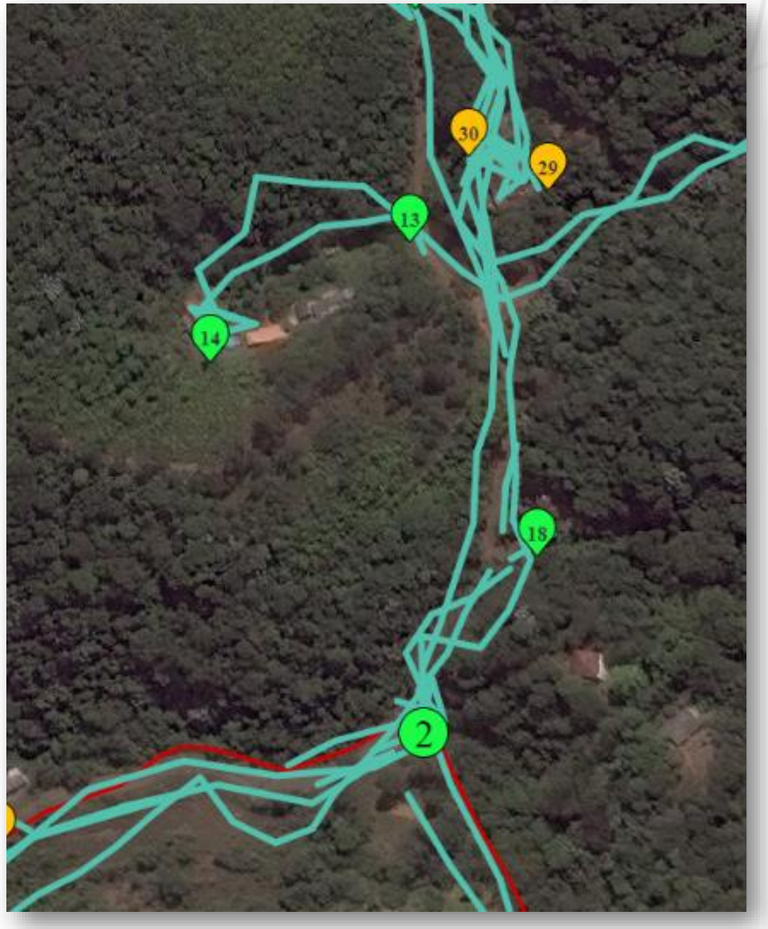
Source: IBGE, Brazil.

SOME ADVANTAGES OF INTEGRATED DATA

Improves the quality of statistical data, through planning and supervision of field operations

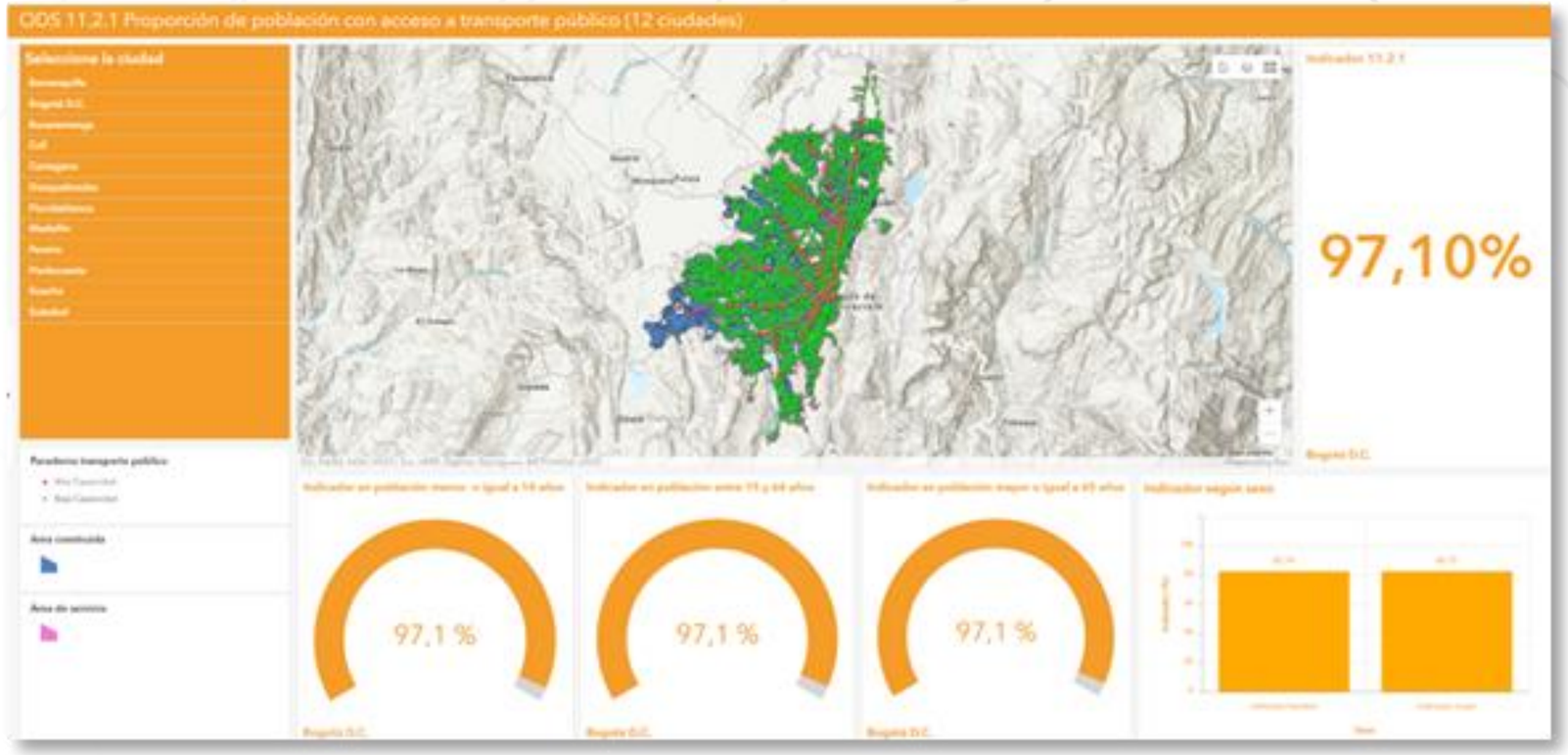


Thanks to use of **geospatial information** during the 2022 Census operation, it was possible to **monitor the enumerators routes** in **real time** (through 3G, 4G networks), making it easy to **identify areas** of the territory **that had already been covered** and plan possible correction actions of coverage.

Source: IBGE, Brazil.

SOME ADVANTAGES OF INTEGRATED DATA

Provides new information, which can only be achieved when the statistical and geospatial data are integrated



Source: DANE, Colômbia

Ex: SDG 11.2.1 - Proportion of the population that has convenient access to public transport. Need georeferenced information from Demographic Censuses and georeferenced information on public transport

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SOME ADVANTAGES OF INTEGRATED DATA

Provides greater meaning to statistical information: A set of common geographies, based on typologies, regional divisions and political-administrative divisions allows the evaluation of statistics in significant geographies for a better understanding of society and to build better public policies.

The Favela of Paraisópolis and the wealthy neighborhood of Morumbi are neighbors in São Paulo. The statistics for these two areas need to be analyzed separately. For this, it is necessary to have the Slums in the set of Common Geographies.

Source: Tuca Vieira.

SOME ADVANTAGES OF INTEGRATED DATA

Provides greater meaning to statistical information: A set of common geographies, based on typologies, regional divisions and political-administrative divisions allows the evaluation of statistics in significant geographies for a better understanding of society and to build better public policies.

Leme			
Pessoas de 10 anos ou mais de idade	Total	17854	-
	Nível de instrução: Sem instrução e fundamental incompleto	2970	16,6%
	Nível de instrução: Fundamental completo e médio incompleto	1848	10,4%
	Nível de instrução: Médio completo e superior incompleto	5310	29,7%
	Nível de instrução: Superior completo	7654	42,9%
	Nível de instrução: Não determinado	72	0,4%

Fonte: Censo Demográfico, 2010.

Taking advantage of the Slum delimited areas, a work was done in the 2010 Brazilian Census to generate sample expansion areas that portrayed their characteristics. The image shows a regular expansion area of the sample, merging rich areas to the slum area. The result indicates that the whole area has **42.9%** of its population with higher education, but…..

Source: IBGE, Brazil.

SOME ADVANTAGES OF INTEGRATED DATA

Provides greater meaning to statistical information: A set of common geographies, based on typologies, regional divisions and political-administrative divisions allows the evaluation of statistics in significant geographies for a better understanding of society and to build better public policies.

Source: IBGE, Brazil.

Áreas de divulgação da amostra para aglomerados subnormais - Rio de Janeiro 4

			Total	Aglomerados subnormais		Demais áreas	
				Pessoas	Percentual	Pessoas	Percentual
Pessoas de 10 anos ou mais de idade	Total		374 346	24 771		349 575	
	Nível de instrução	Sem instrução e fundamental incompleto	57 080	12 981	52,4	44 100	12,6
		Fundamental completo e médio incompleto	38 619	5 536	22,3	33 084	9,5
		Médio completo e superior incompleto	102 334	5 839	23,6	96 495	27,6
		Superior completo	174 712	318	1,3	174 400	49,9
		Não determinado	1600	103	0,4	1497	0,4

Fonte: Censo Demográfico, 2010.

……when the statistics of the slum areas are isolated, the percentage of population with a higher education is only **1.3%**, while in the regular areas of this part of the city the percentage is **49.9%**. Only integrated geospatial and statistics information can reveal this reality.

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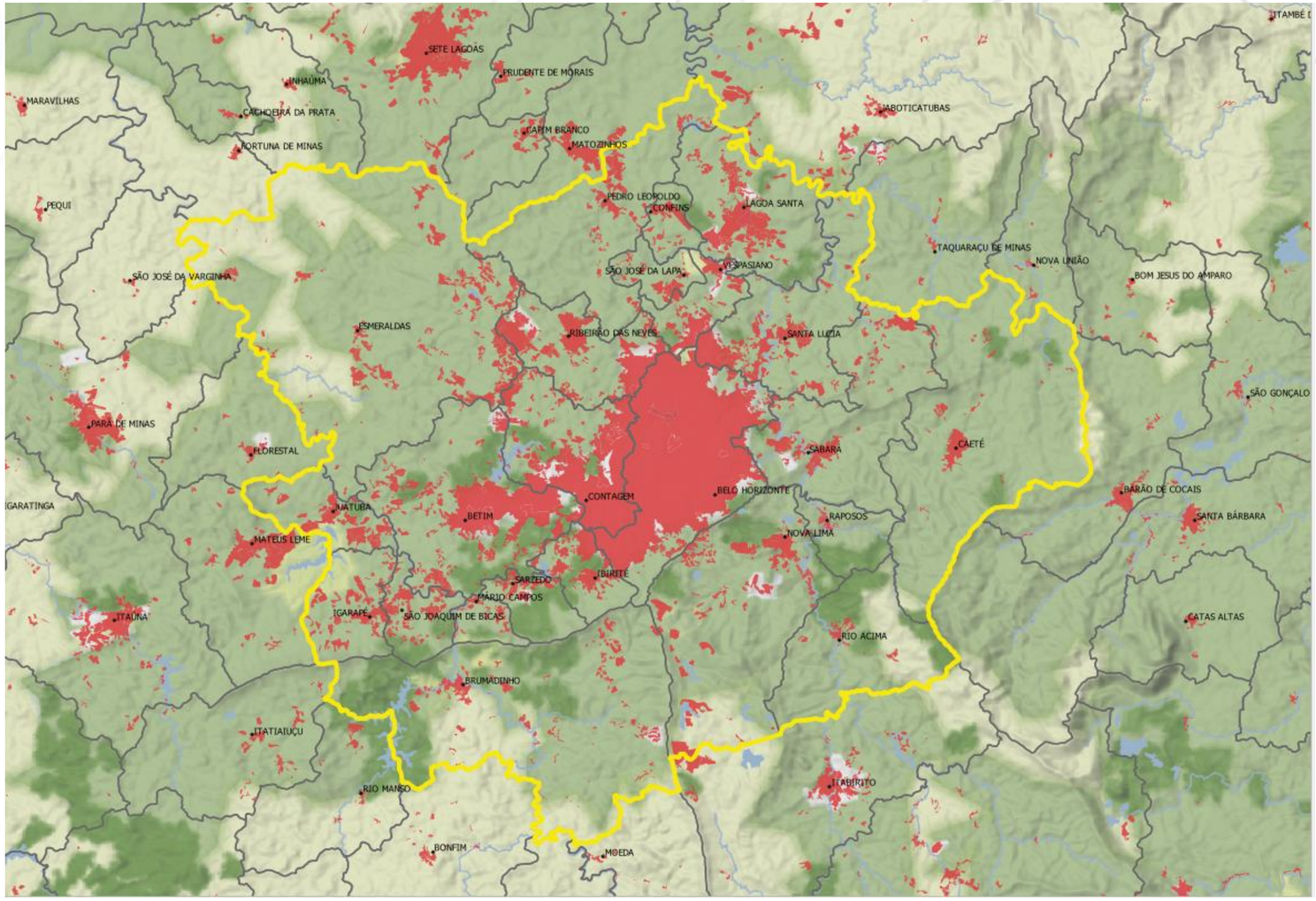

This map shows the mapping, by remote sensing, of **Urban Footprint of Belo Horizonte**. The **gray** lines show the **municipal boundaries**, and the **yellow** line shows the **metropolitan area**. It is only possible to understand the demographic expansion and occupation of the land when evaluating the set of the metropolitan space, which represents a "**common geography**" that will make the generated statistics more meaning. This information is related to the SDG indicator 11.3.1: "**Ratio of land consumption rate to the population growth rate**"

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Source: IBGE, Brazil.

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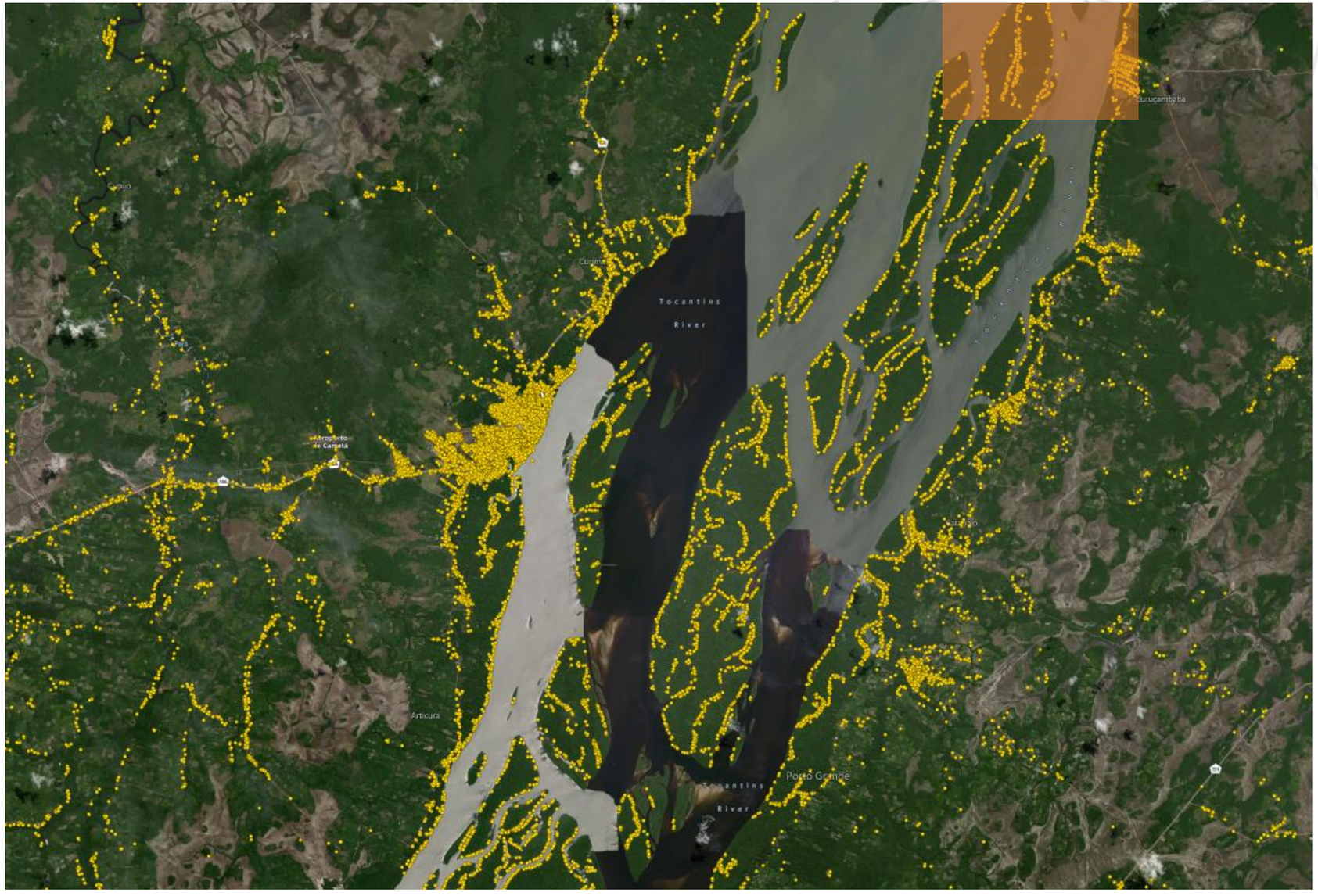

How is it possible to improve public policies through the integration of statistical and geospatial information?

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Source: IBGE, Brazil.

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For example, the need for schools can be accurately measured for the population that lives in this small water channel inside the island or, appropriately and efficiently, a treated water supply network for this small village can be designed.

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Source: IBGE, Brazil.

SOME ADVANTAGES OF INTEGRATED DATA

Common geographies (Principle 3) may include things such as:

- **Municipalities;**
- **Urban agglomerations;**
- **Neighborhoods**
- **Watersheds**
- **Biomes**
- **Vegetation types**
- **Statistical grid**
- **Etc.**

They provide greater meaning to statistical information and allow integration between different types of information, such as remote sensing and demographic data.

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SOME ADVANTAGES OF INTEGRATED DATA

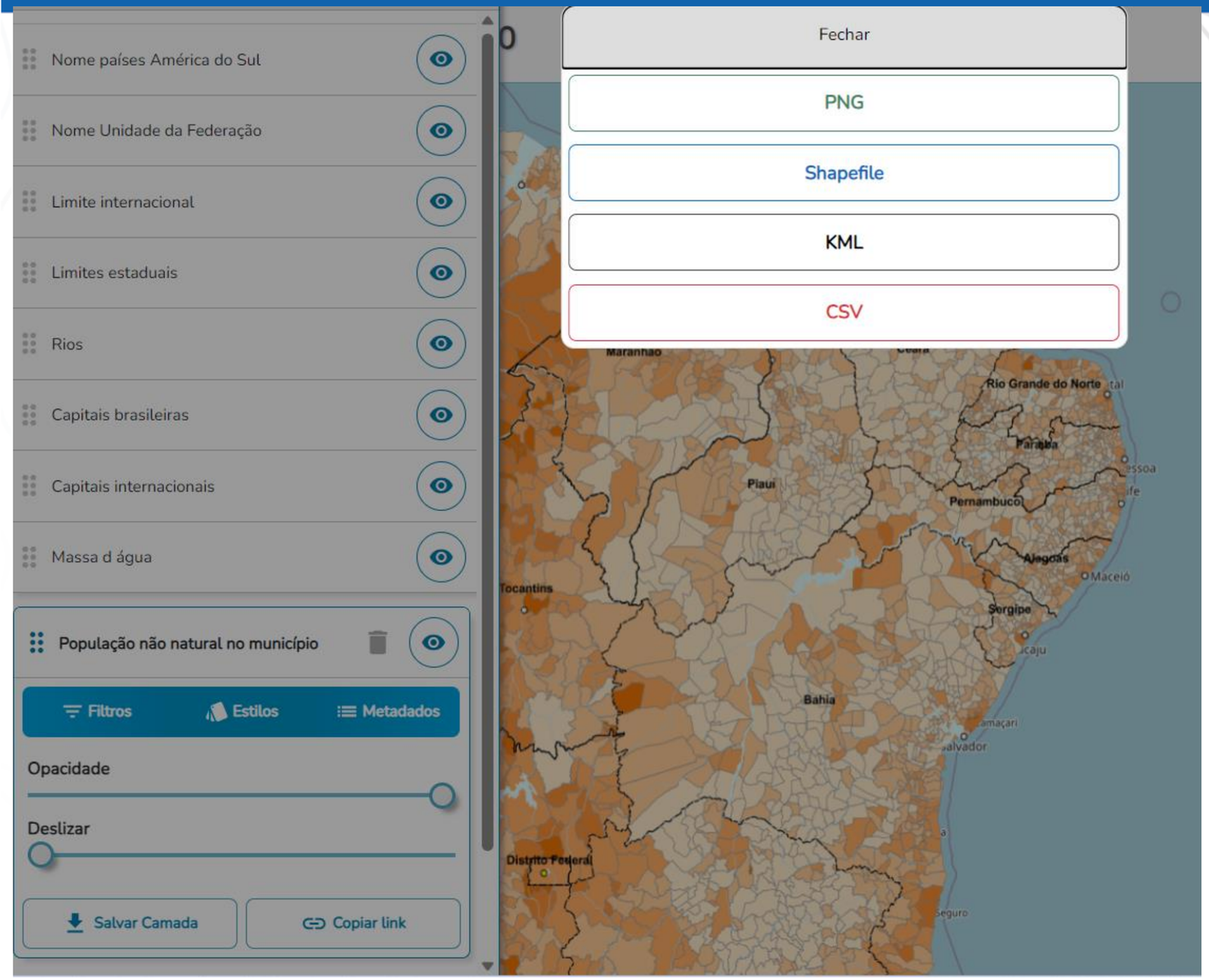
Enables production of information for small areas

In order to leave no one behind, it is necessary that the information be made available to small areas. A efficient public policy needs this kind of geographic disaggregation.

Source: US Census Bureau, USA

SOME ADVANTAGES OF INTEGRATED DATA

Provides interoperability, easy access and usability of integrated information.



Based on international standards, information can be made available in an accessible and in an interoperable way.

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Source: IBGE, Brazil

Why statiscal-geospatial integrated information...

- Save money
- Improve life quality
- **Save lifes?**

Because...

- It allows the production of information for small areas;
- It allows to find the most relevant geography to produce meaningful statistics and better reveal the reality of society;
- It allows public policies to be more efficient and focused in order to leave no one behind;

Because...

- It allows more sophisticated analyzes to be carried out, based on territory, and with the integration of different themes;
- It allows more efficiency in public and private investments;
- It reduces the possibility of conflicts, as analyzes and actions can be carried out based on territories;
- It improves the quality of statistical data, improving planning and supervision of field operations.

THE POWER OF GSGF TO REVEAL THE REALITY

Thank you very much!

claudio.stenner@ibge.gov.br

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Chico Mendes Extractive Reserve, in the state of Acre (Brazil), with green boundaries. The dots in the image indicate homes, within the Amazon forest of Seringueiros. They walk through the forest to extract latex, the raw material for natural rubber.

Statistical Commission

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Source: IBGE, Brazil.