The global indicator Framework: New and Innovative Methods for Disaggregation by geolocation.

Revealing the secrets of the territory

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Summary

1) How to characterize the territories?

   A) Diversity of territorial patterns

2) Geospatial information for SDGs and public policy

   A) Geocoding statistical data

   B) Information and statistics from geospatial data

   C) Flows and territory articulations

   D) Finding relevant geographies

3) Integrated environment of information for SDGs and public policy

4) Final remarks

How to characterize the territories?

How to characterize the territories?

<u>Local, regional characteristics:</u>

* They are the result of a historical formation process.
* It is related to territorial cohesion, cultural ties, identity.
* It is related to natural and social characteristics.

<u>Network articulation:</u>

* The flow space controls the economic process of organization of the territory.
* The space is unequally connected.
* The network articulations is the most powerful force of transformation of the territory.

> For good public policy and 2030 agenda implementation, it is necessary to know its local, regional characteristics and how it articulates with other regions

How to characterize the territories?
Diversity of territorial patterns in Brazil

Irece region, Bahia, Brazil

(scale A - local)

Let's compare 4 Brazilian regions to better show the diversity and complexity of the territory. This region has a high rural density, small properties, family farming and small settlements.

How to characterize the territories?
Diversity of territorial patterns in Brazil

Irece region, Bahia, Brazil

(scale B - microregional)

Previous area
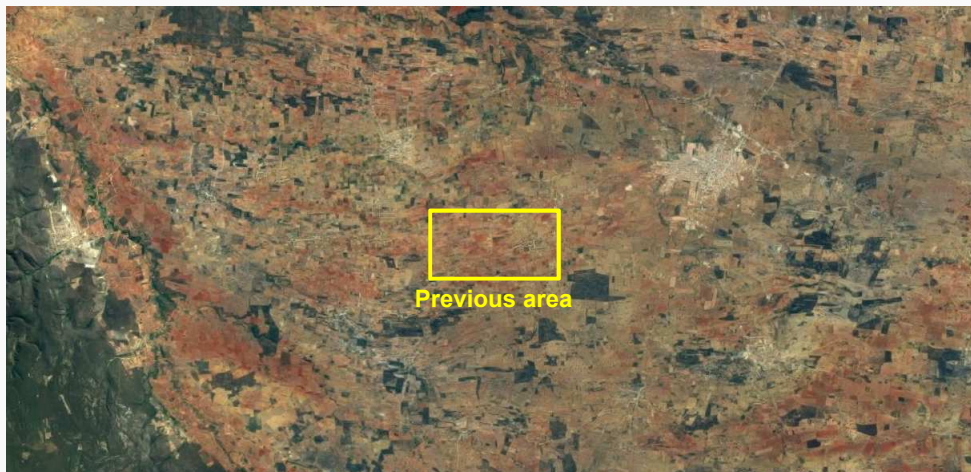
The largest urban area is Irecê, with just over 50 thousand inhabitants. There are also other small urbanized areas.

How to characterize the territories?
Diversity of territorial patterns in Brazil

Irece region, Bahia, Brazil

(scale C - regional)

The whole region has similar characteristics

How to characterize the territories?
Diversity of territorial patterns in Brazil

Luis Eduardo Magalhães region, Bahia, Brazil

(scale A - local)

This region is characterized by low rural population density, large farms and modern agribusiness (soy, maize, cotton)

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How to characterize the territories?
Diversity of territorial patterns in Brazil

Luis Eduardo Magalhães region, Bahia, Brazil

**(scale B - microregional)**

Previous area

The transition from the urbanized landscape to the rural landscape is abrupt. The urbanized area has emerged and owes its dynamics to supporting agribusiness. Luis Eduardo Magalhães has about 40 thousand inhabitants

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How to characterize the territories?
Diversity of territorial patterns in Brazil

Luis Eduardo Magalhães region, Bahia, Brazil

(scale c - regional)

Previous area
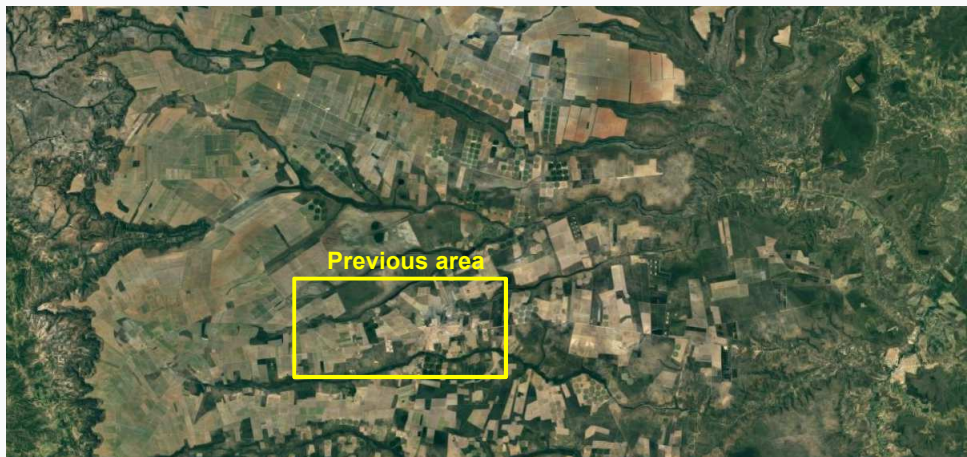
The landscape in the area has plantations spreading over large tracts of land, with the population concentrated in the urbanized areas. In the image it is possible to see Barreiras, main city of the region, with about 120 thousand inhabitants and with a deep relation with the surrounding rural areas

How to characterize the territories?
Diversity of territorial patterns in Brazil

Ribeirão Preto region, São Paulo, Brazil

(scale A - local)

This region has medium properties and large mechanized production of sugar cane, integrated to industrial plants of ethanol and sugar

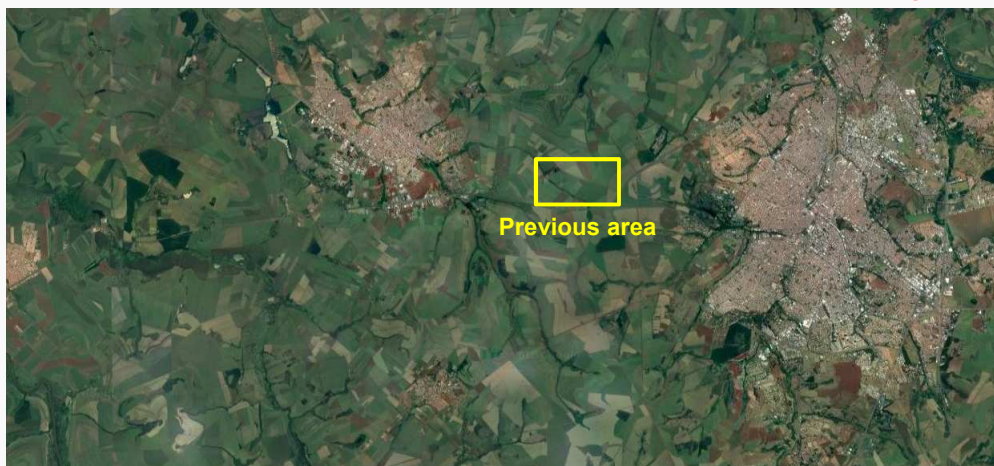**How to characterize the territories?**
Diversity of territorial patterns in Brazil

Ribeirão Preto region, São Paulo, Brazil

(scale B - microregional)

Previous area

It is located in a highly urbanized area with a complex urban network. Ribeirão Preto, with about 600 thousand inhabitants is the main city.
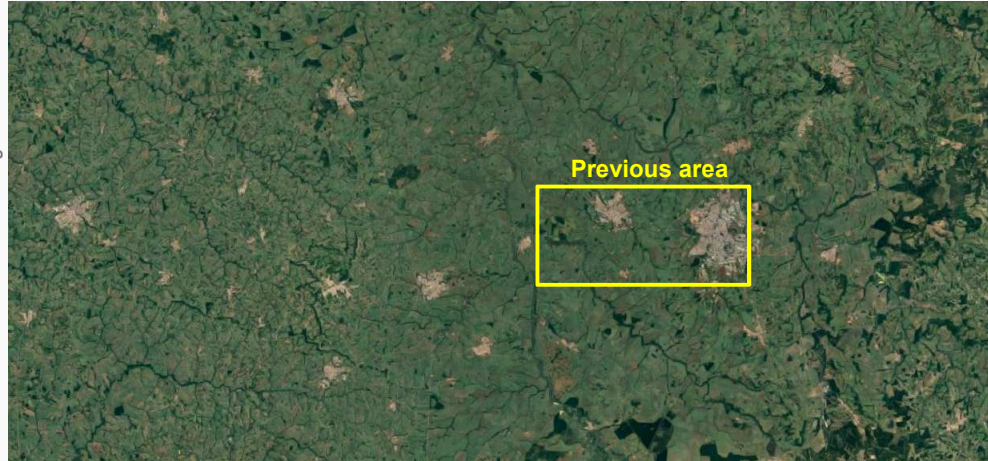
How to characterize the territories?
Diversity of territorial patterns in Brazil

Ribeirão Preto region, São Paulo, Brazil

(scale c - regional)

It is possible to see in this image numerous cities that characterize the urban network of the region near the metropolis of São Paulo.

How to characterize the territories?
Diversity of territorial patterns in Brazil

Uarini region, Amazonas, Brazil

(scale A - local)

This is a typical riverside occupation of the Amazon region, characterized by the small production of cassava and fishing. There are no roads in this area and the commutes are made by the rivers.

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How to characterize the territories?
Diversity of territorial patterns in Brazil

Uarini region, Amazonas, Brazil
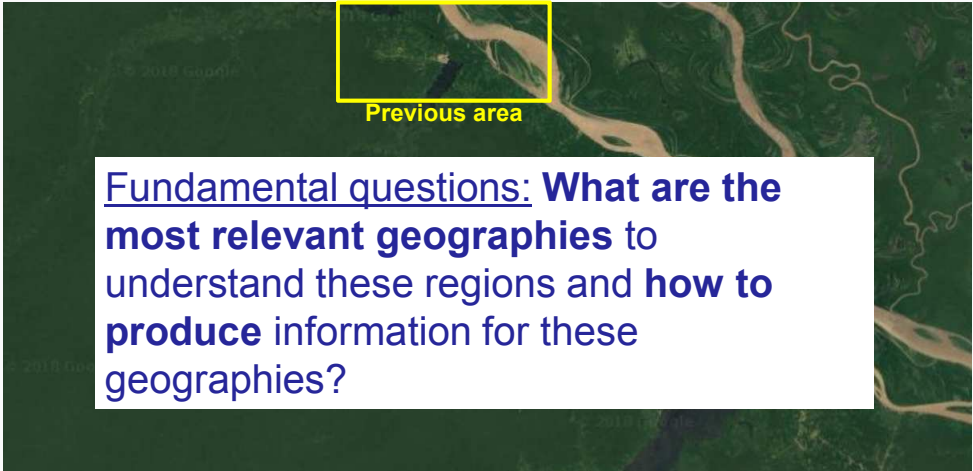
(scale B - microregional)

Previous area

Most of the area preserves rain forest cover. The urbanized area that appears in the image is the seat of the municipality of Uarini, with little about 7 thousand inhabitants. Its main function is to provide basic services to the population.

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How to characterize the territories?
Diversity of territorial patterns in Brazil

Uarini region, Amazonas, Brazil

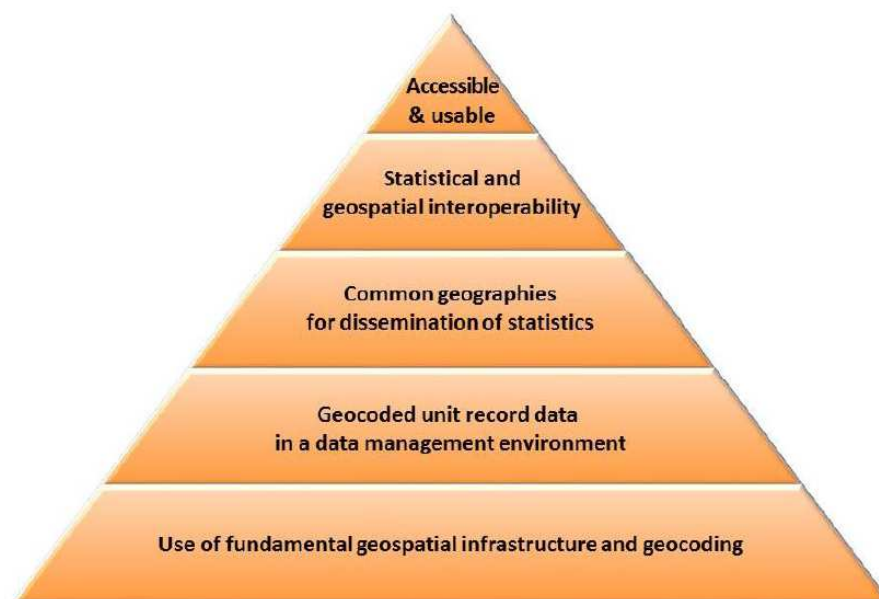**(scale c - regional)**

Previous area

Fundamental questions: **What are the most relevant geographies** to understand these regions and **how to produce** information for these geographies?

The rainforest dominates the landscape. It is possible to see in the image the city of Tefé (50 thousand inhabitants), main urban reference of a vast region.

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Geospatial information for SDGs and public policy

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Geospatial information for SDGs and public policy

Global Statistical Geospatial Framework (GSGF)

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

Geospatial information for SDGs and public policy

Global Fundamental Geoespatial Data Themes

Challenge: Maintain all geospatial issues with periodic updating and also to develop a methodology to monitor changes, so as to provide subsidies for SDG implementations. Monitoring involves the maintenance of production methodologies and the identification of changes occurring in the territory, in order to generate statistics and information for SGDs

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Geospatial information for SDGs and public policy
Geocoding

Why is geocoding important? When you have household and economic surveys accurately georeferenced, with the location of each households and establishments units, you can design more accurate geographies and produce better statistics in to direction of the objectives of general public policy and SDGs.

Geospatial information for SDGs and public policy
Geocoding – Example of brazilian census
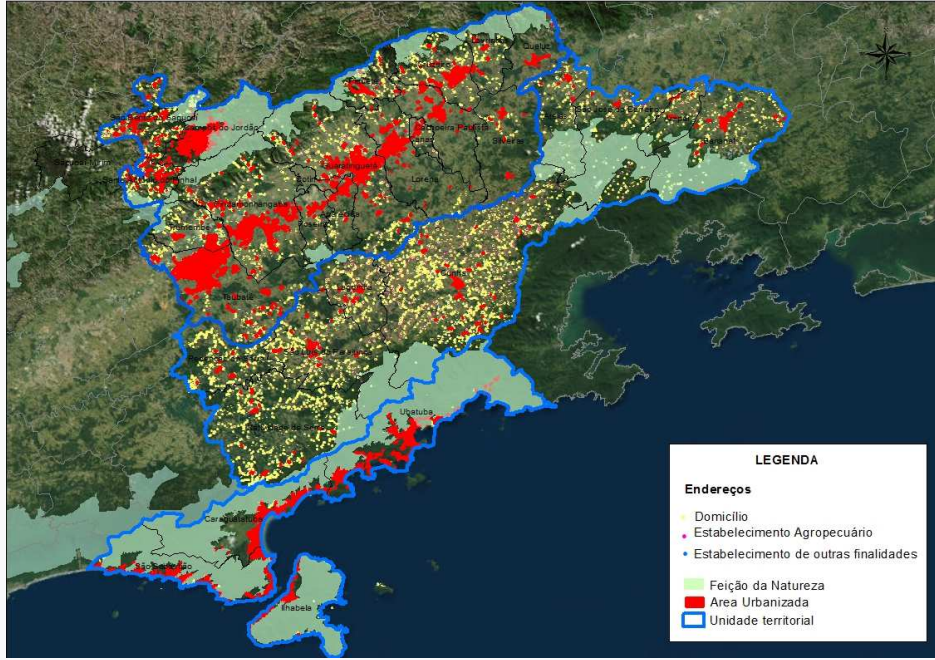
Geospatial information for SDGs and public policy
Geocoding – Example of brazilian census
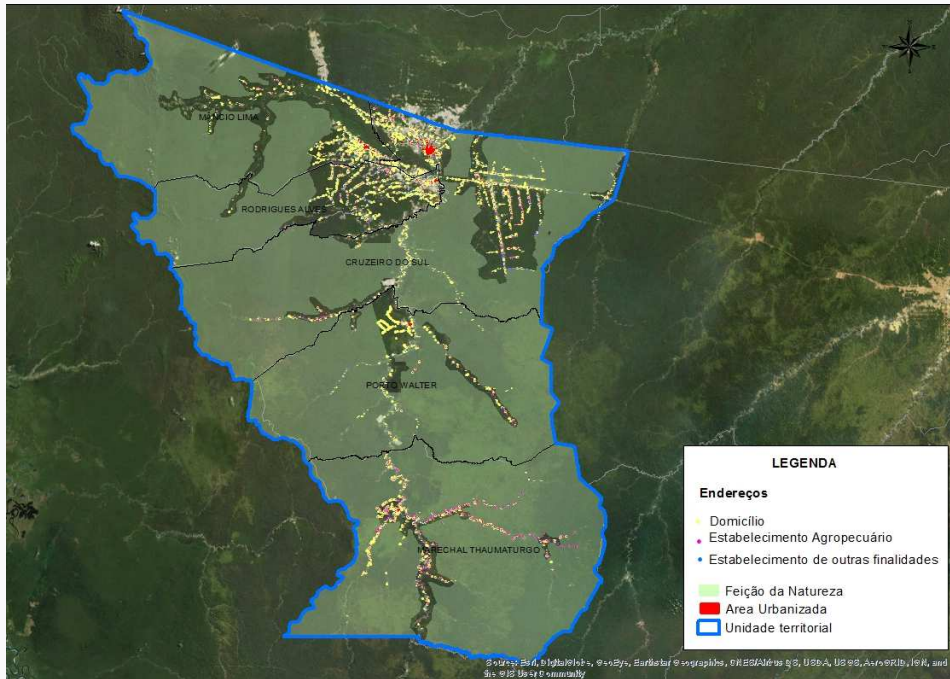
Geospatial information for SDGs and public policy
Information and statistics from geospatial data – urbanized/built-up areas example
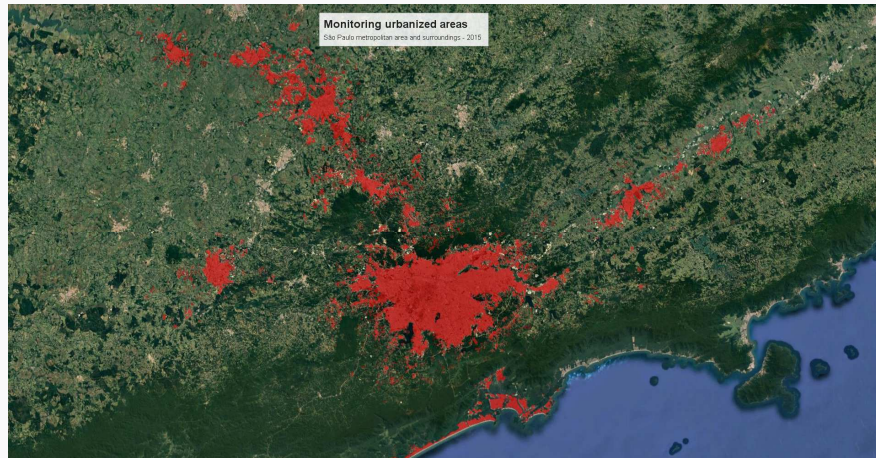
Urbanized/built-up area: We have all urban areas with more than 100.000 inhabitants delimited in a scale of 1:50.000. We are working to delimited others urban areas until the end of 2020. This information will improve Census track classification and is key to updating the definition of urban agglomerations.

Geospatial information for SDGs and public policy
Information and statistics from geospatial data – urbanized/built-up areas example
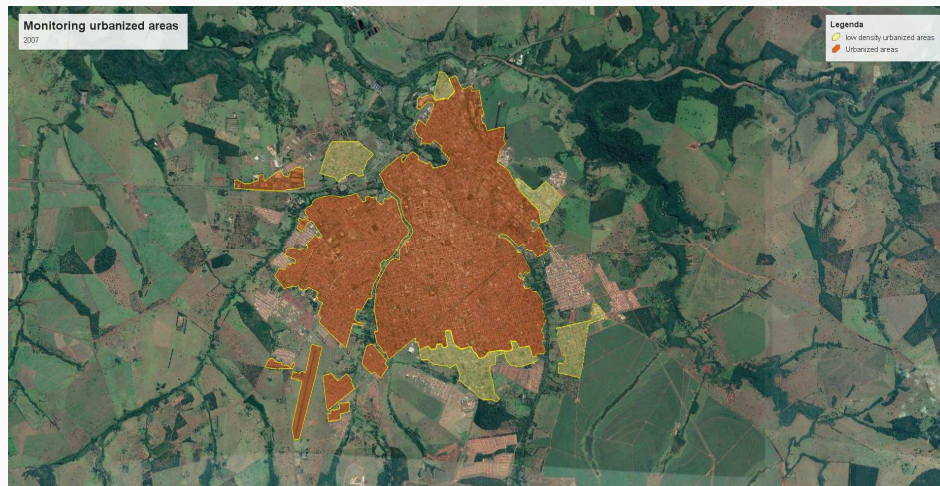
Urbanized/built-up area challenge: Create a process to monitoring the urbanized area growth in order to offer local level information. We will work on this process in 2018.

Geospatial information for SDGs and public policy
Flows and territory articulations – Urban network example

This map shows the urban hierarchy of Brazilian cities and how they are articulated. This is a crucial geospatial information for territorial management: the urban network is the main structural element of the territory.

Geospatial information for SDGs and public policy
### Flows and territory articulations – Urban network example

São José do Rio Preto (SP) - Capital Regional B (2B)

This map shows a detail of the previous map, where it is possible to identify the dominant links between cities. This information is useful, for example, to determine in which city a new regional hospital should be built and what size it should have.

Geospatial information for SDGs and public policy
Flows and territory articulations – economic flows (e-invoices)

This map shows a new approach to the understanding of economic articulations between cities with the use of administrative records of electronic invoices. Here we show the sales intensity of the municipality of Ribeirão Preto.

Geospatial information for SDGs and public policy
Flows and territory articulations – economic flows (e-invoices)

The same information for the municipality of Campinas indicates links to far more distant regions.

Geospatial information for SDGs and public policy
Flows and territory articulations – economic flows (e-invoices)

Observing the economic relations within the region of Campinas, there is a complex web of relations, indicating a high economic density in the region.
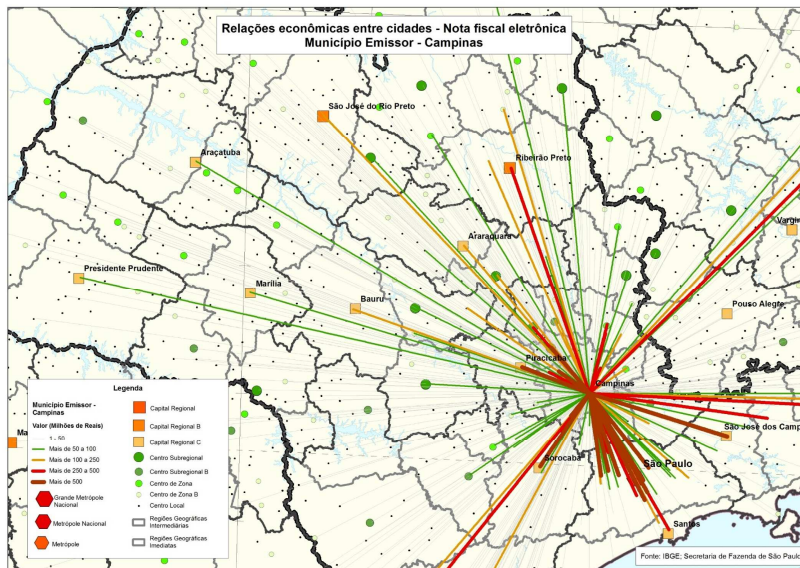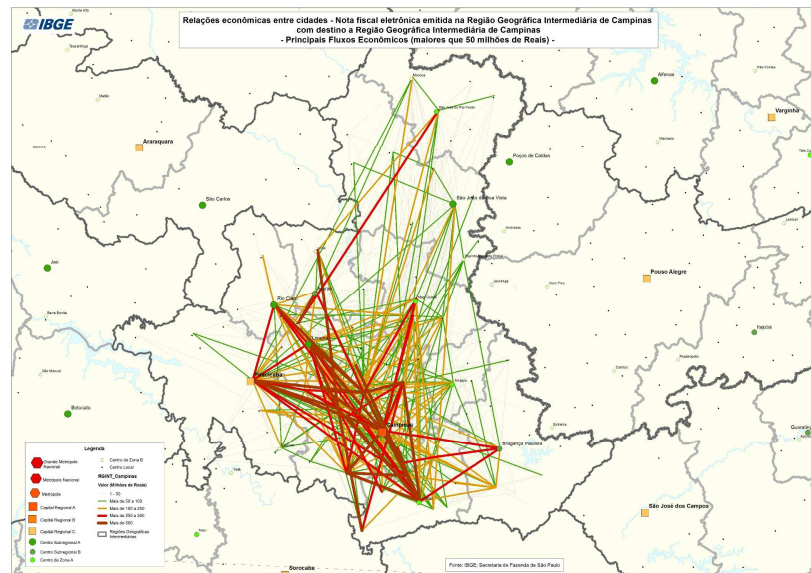
Geospatial information for SDGs and public policy
Flows and territory articulations – economic flows (e-invoices)
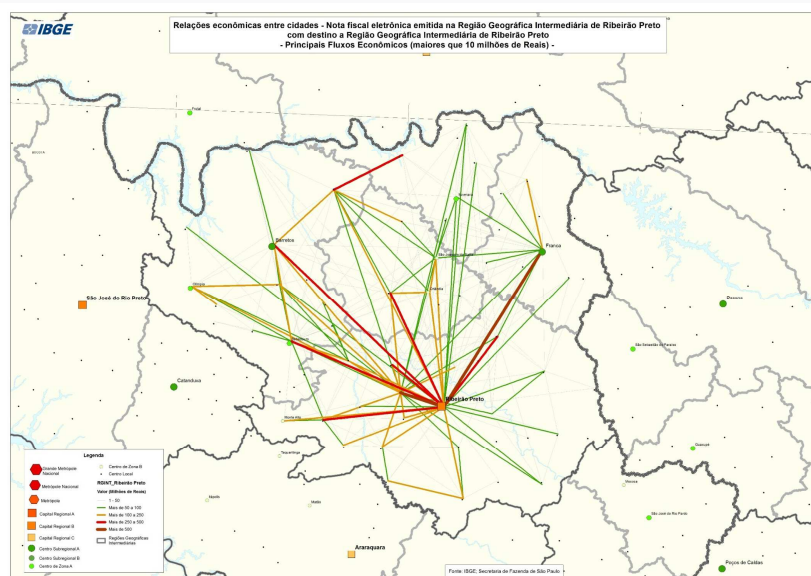
The same evaluation for the region of Ribeirão Preto indicates a strong convergence of the economic flows to its main city and a density of relations much less complex than that existing in the region of Campinas.

Geospatial information for SDGs and public policy
Finding relevant geographies

- Appropriate geographies allow for a more accurate interpretation of statistics, as territorial patterns are translated into geographies for the dissemination and analysis of statistics.

- Geographic typologies and regional divisions constitute geospatial information that is fundamental for 2030 agenda, since it allows the territorial patterns to be unveiled and provide adequate statistics for public policies.

Geospatial information for SDGs and public policy
Finding relevant geographies

Geographical reference framework for dissemination and analysis of IBGE statistics
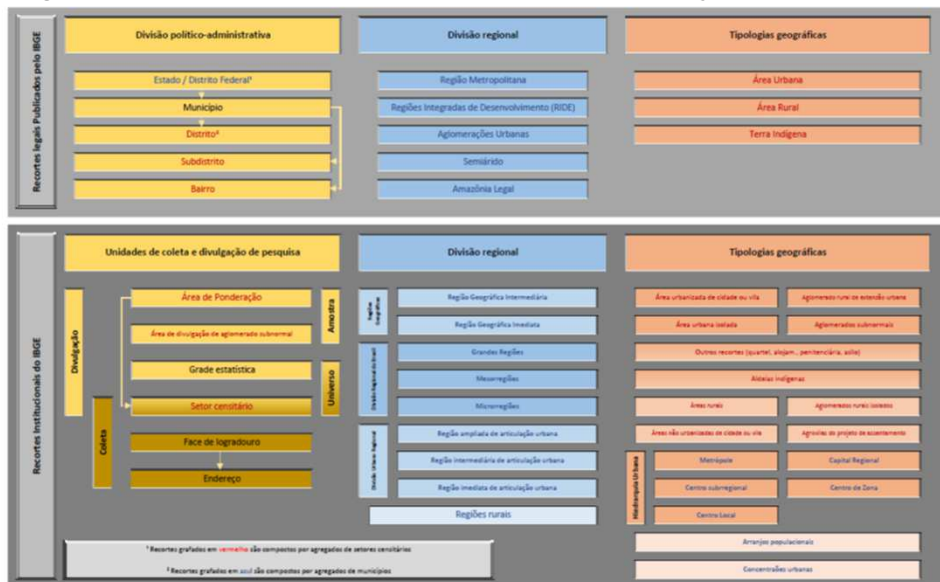
Geospatial information for SDGs and public policy
Finding relevant geographies – Slum areas example

Identifying and delimiting slum areas and storing their geometries and attributes in a database environment is fundamental for the production of statistics that can subsidize public policies aimed at these poor areas. Today in Brazil there are almost 7000 slum areas registered in more than 350 municipalities.

Geospatial information for SDGs and public policy
Finding relevant geographies – Slum areas example

Slum areas in Fortaleza, Brazil
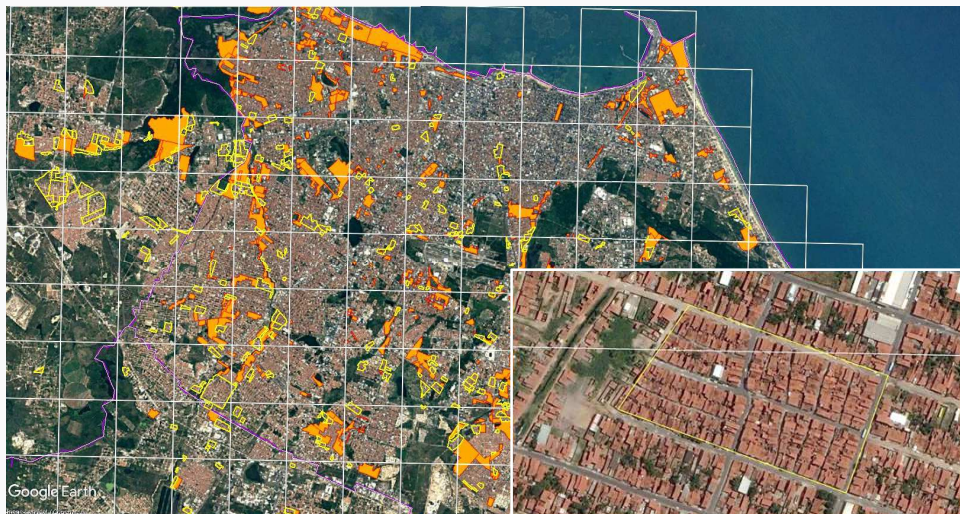
The identification and delimitation of these areas represents a systematic effort to scan the territory through satellite images, consultations with city halls and fieldwork.

Geospatial information for SDGs and public policy
Finding relevant geographies – Slum areas example

Taking advantage of the Slum delimited areas, a work was done in the 2010 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…..

Geospatial information for SDGs and public policy
Finding relevant geographies – Slum areas example

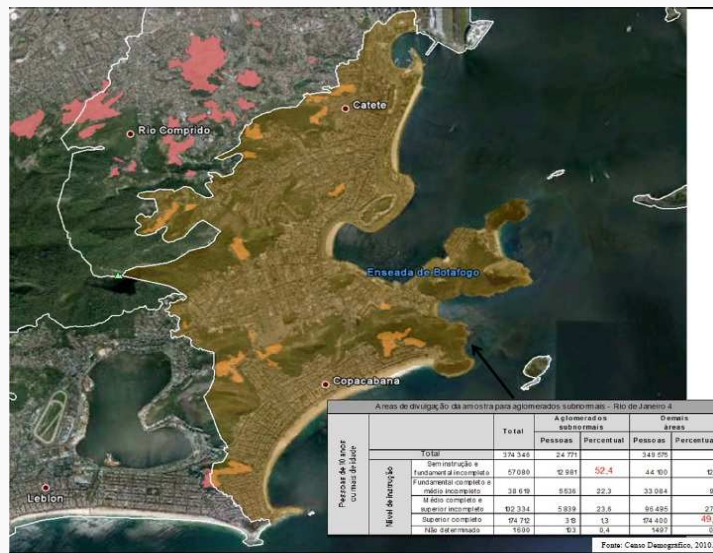……when the statistics of the slum areas are isolated, the percentage of population with a higher education is only 1.3%, while in the regular areas of this part of the city the percentage is 49.9%. Only geospatial information can reveal this reality.

Geospatial information for SDGs and public policy
Finding relevant geographies – Regional inequality example

Regiões Geográficas Imediatas com PIB per capita inferior a 50% da média nacional - 2015
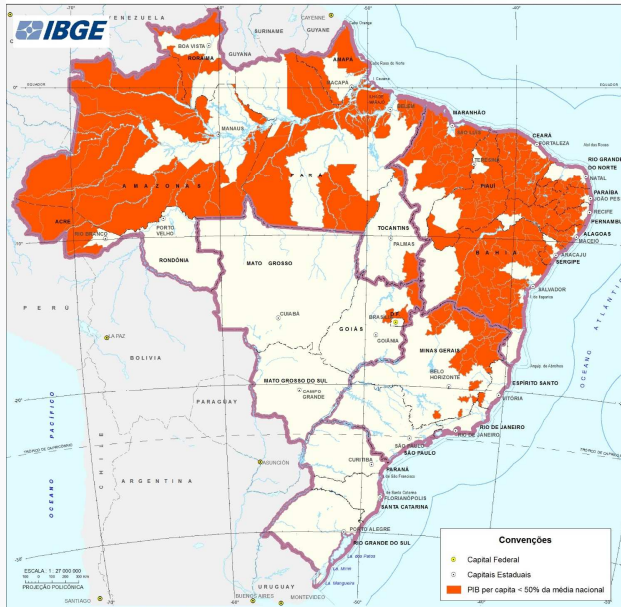
This map indicates which immediate geographic regions (set of 508 small regions that the IBGE divided the country) have per capita GDP less than 50% of the national average. The deep regional inequality is evident, but….

Geospatial information for SDGs and public policy
Finding relevant geographies – Regional inequality example

Regiões Geográficas Imediatas com PIB per capita inferior a 50% da média nacional, municípios polos - 2015
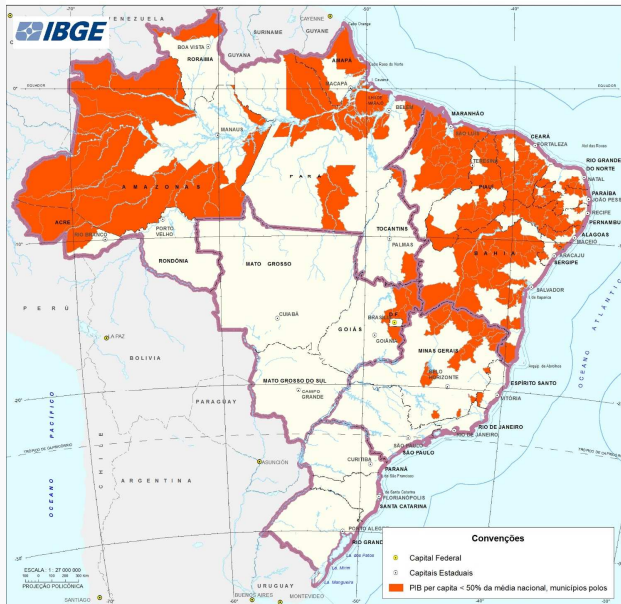
...... when isolate the information only from the **main city of each region**, the covered area of the country with GDP per capita below 50% of the national average is smaller, indicating that main cities are richer, and…..

Geospatial information for SDGs and public policy
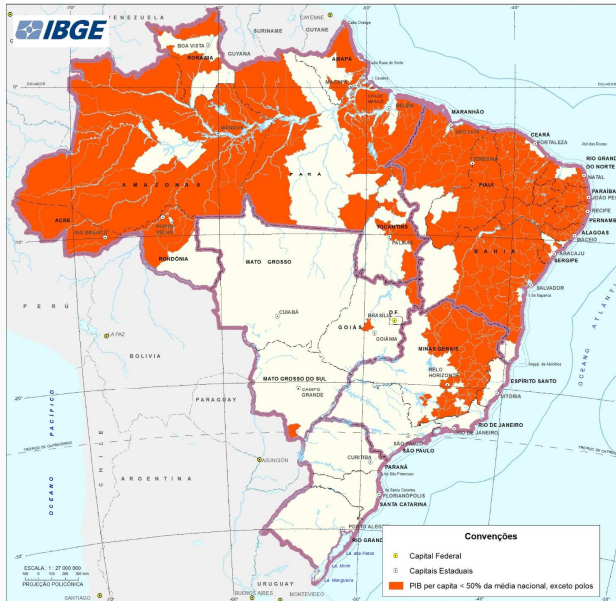### Finding relevant geographies – Regional inequality example

Regiões Geográficas Imediatas com PIB per capita inferior a 50% da média nacional, exceto municípios polos - 2015

...... Information from the **other municipalities of the regions** (except the main city) are isolated, it is noticed that there are many more regions with GDP per capita below 50% of the national average. In addition to macro-regional inequality, this geographical approach shows that there is also a strong intraregional inequality, which may indicate the need for a suitable public policy that does not concentrate resources in the main cities

Geospatial information for SDGs and public policy
Finding relevant geographies – Urban aglomeration delimitation
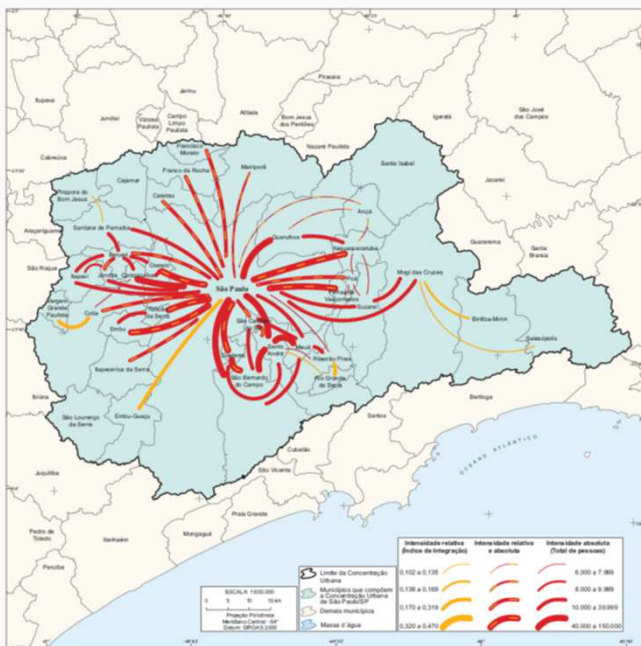
Finding the existing urban agglomerations in the territory is indispensable for the execution of any public policy that involves the cities. In Brazil, 293 urban agglomerations involving 935 municipalities were identified. The sources used were the delimitation of the urbanized areas and work and study commuted data.

In this example, the municipality of São Paulo had in 2010 censos, 19.6 million inhabitants spread over 31 municipalities. The municipality of São Paulo alone had 11.3 million inhabitants,

Geospatial information for SDGs and public policy
Finding relevant geographies – Remoteness example

The territory has very diverse accessibility conditions: some areas are isolated and distant from cities. This type of classification, shown here by the identification of the remote municipalities of the country, makes it possible to develop specific policies for these more isolated areas.

Geospatial information for SDGs and public policy
Finding relevant geographies – Rural-urban classification
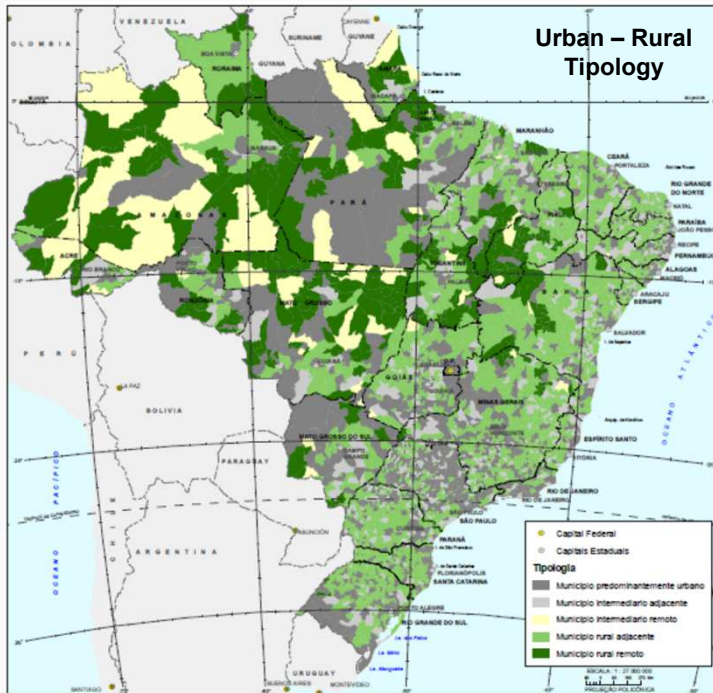
Improving the classification of rural and urban areas provides more precise indicators for the implementation and monitoring of the 2030 agenda. In Brazil we are working on the revision of this classification.

Integrated environment of information for SDGs and public policy

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Integrated environment of information for SDGs and public policy

- There are three fundamental "bricks" in order to guarantee an integration of the information:
    - The implementation and adoption of the National Spatial Data Infrastructure (NSDI)
    - The adoption of the Global Statistical Geospatial Framework principles
    - The adoption of the international interoperability and open data standards, like SDMX and OGC standards.

- Following these principles, data from various sources can be integrated into consultation and analysis systems.

Final Remarks

Final Remarks

- For the implementation of 2030 agenda , geospatial information **professionals have to seek to reveal the "nudity" of the territory, unveiling the hide geographical patterns, its secrets, trough**:

  - **Finding the relevant geographies**, classifying the territory: It is a key process to produce good indicators to implement and monitoring the SGDs and general public policy. If the "right geography" is not known, people will be forgotten by the Agenda 2030.

  - Producing geospatial information from statistical data.

  - Producing geospatial information from remote sensing, ground sensors and fieldwork.

Final Remarks

- Knowing the characteristics of each part of the territory, **but also its articulations with other parts of the territory**; its zonal and relational attributes: knowing the flows is fundamental to monitoring the SDGs and to develop policies to the implementation of the agenda;

- **Develop methodologies to monitor changes in the territory over time:** it is necessary to guarantee the stability of the methods over time, including the sources of information

- **There are good international standards and recommendations** for the production and interoperability of information: adopting them is fundamental.

Thank you very much!

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