

## Methodological review of the urban-rural typology in the 2022 Demographic Census

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THEMATIC ARTICLE

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**Abstract** *This article deals with the methodological review of the differentiation of urban and rural areas and enumerations areas in the 2022 Demographic Census. As such a methodology is the result of an evolutionary process of understanding the territory, involving a wide range of techniques, instances and scales, our study sought, in a synthetic manner, to rescue the history of this differentiation in Brazilian territorial planning, confronting different objectives and conceptual bases, such as statistical purposes, territorial management, and geographic analyses. Subsequently, the new conceptual framework of the Census Cartography is presented, constructed, for the first time, based on the use of high-resolution orbital images that, supported by fieldwork, brought the census section closer to the space lived and perceived by people. This context gives the initiative an innovative character, which will guide the dissemination of updated data for both urban and rural scenarios, as well as for rural settlements, cities, and towns, an important input necessary to understand the concentration and dispersion of the population throughout the country and their respective modes of life.*

**Key words** *Demographic Census, Urban, Rural, Spatial planning*

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## Introduction

Urban/rural differentiation is a relatively old topic. The planning in Roman Law in Roman law, for example, differentiated properties (*fundus*) according to urban and rural conditions. In this context, the city concentrated, in addition to public and political life, the administrative and commercial functions of the dominant social group. The other space, divided into rustic lands, including large estates, was destined for agricultural, pastoral, and extractive production, in a pre-capitalist production system, in which enslaved labor predominated<sup>1</sup> (p. 68). This territorial order, supported by private property, spread throughout Europe and was brought to Brazil by the European colonizer, in the form of the *sesmarial system* integrated with the foundation of cities and towns, with their respective chambers and jurisdictions.

Over time, urban and rural became traditional categories to differentiate spaces, populations, and contexts, present in the scientific discourse in its broadest definitions. In Geography, Sociology, Economy, and their interfaces, the discussion surrounding the distinction between urban and rural spaces was the driving force behind the development of several theories and empirical scientific assertions concerning the form of agglomeration and the dispersion of human beings and constructed materialities based on their presence in the world and their relationship with nature. With the advent of Statistics, this discussion reached state structures, becoming a structuring demand for public administration, both from the point of view of the national and international production and dissemination of population data, as well as with regard to the planning and execution of policies and government programs.

Many gaps can be found when searching for a classification that can support an in-depth analytical study of the country's reality, given the complex dynamics of urban and rural spaces in Brazil today. Thus, this article aims to clarify the process of construction of the urban and rural categories by Brazilian institutions, especially by the Brazilian Institute of Geography and Statistics (IBGE) in the formulation of its Territorial Base, subsequently used in each operation of the survey and dissemination of statistics and geographic data. The first section deals with the origin of the current methodology for defining urban areas in Brazil, from the context of its formulation to the formats it currently applies. The second section contains reflections and clarifications concerning the 2010 Census methodology.

And the third part presents a general picture of the criteria currently adopted by IBGE, signaling changes and improvements made to the urban/rural classification methodology, especially regarding delimitation and characterization of census sectors, the geographic structure unit of the Territorial Base.

It is important to note that this article is based on the 2021 Territorial Base and census sector grid, which subsidized the 2022 data collection and whose methodology will be the subject of a specific publication by IBGE. This base may still undergo possible adjustments resulting from the census work before the long-awaited release of data by census sector status is carried out.

### From territorial ordering to the statistics system

In Latin, *urbis* is Rome. As an adjective, it designates what is related to Rome, from which the idea of the city as a center of power and unit of territorial administration in the vastness of the Roman world emanates, as Tacitus<sup>2</sup> (p. 161) claimed: "because we were citizens of one city". *Urbi et Orbi*, where cities, modeled on the idea of *urbe*, were essential as an instrument of colonization, enabling the maintenance of territorial and military power over conquered areas. Hence the *Municipium*, a political-administrative unit based in the city or town, which embodies the process of territorialization of the empire<sup>3</sup> (p. 33).

In Brazil, colonization also made use of the municipality, present through the creation of cities and towns, which were delimited by term and provided with *rossio*. However, the need to identify what qualifies as urban appeared, in a more evident and institutionalized manner, with the creation of the tenth building, established by the royal charter of 1808<sup>4</sup>:

I. *The owners of all urban buildings that are ready to be inhabited, in this Court and in all other cities, towns, and notable places located on the seafront in this State of Brazil [...], shall henceforth pay annually to my Real Fazenda 10% of your net income.*

II. *Urban buildings will be considered all those that, according to the demarcations of the respective Chambers, are included within the limits of Cities, Towns and Notable locations.*

Since the creation of the *Décima Predial* (also known as the *Urban Tenth*), several laws and decrees deal with the urban condition of buildings and the need to demarcate tax incidence areas, as noted, for example, in the *Decima Predial Regulation*, Decree 152 of 1942<sup>4</sup>:

*Art. 1 The demarcation of the City's limits and the designation of notable locations, whose buildings will be subject to the imposition of the Urban Tenth, will be established every four years [...] by the City Council.*

In other words, with the tax came the need for its own spatial planning, focused on the urban condition of the buildings, duly registered in a property registry created essentially for this purpose. The divisions carried out by parishes/church communities, common in the territorial organization of cities and towns, were then added to these demarcated areas. In Rio de Janeiro, for example, some parishes were considered completely urban (such as those from the center city) and others rural, for the purposes of the *Urban Tenth*.

In the General Census of the Empire, carried out in 1872, the adopted territorial structure was limited to the political-administrative division (Province, Municipality, and Church Community/Parish) without identifying the urban/rural condition of the buildings that housed families, according to decree 797 of 1851. However, in the 1906 Census, carried out in the city of Rio de Janeiro, the fiscal and administrative division by parishes and then by districts, served as the basis for the Sectional Census Commissions, which were circumscriptions defined for operational purposes, which would be further subdivided into collection zones. This organization allowed the dissemination of statistical data according to the condition of the parish: whether it was a city or a suburb<sup>5</sup> (p. 26-27). This methodology, restricted to the Federal District, was evidently not institutionalized at a national level.

Concerns about the urban/rural classification of the entire Brazilian territory emerged with the need to publish data on the country's reality, in an international context marked by the search to promote international comparability of statistical data. This concern gained strength in the Republic, during Vargas' constitutional government. The Brazilian Statistics Institute (*Instituto Brasileiro Estatística* – INE), installed in 1936, emerged as the arm of the centralized Government responsible for offering responses to the demands for organizing the political division, in addition to spatial and statistical information, based on a rationalist ideal of the State<sup>6</sup>.

The National Statistics Convention, ratified by federal decree 1,022/1936, established the uniformity of the territorial grid/framework throughout the country, aimed at the comparability of data from Brazil's general censuses, the "precision and rationality of circumscriptional

limits"; the systematization of nomenclature and "the attribution of the city and town category and forums according to specific criteria clearly established by law"<sup>7</sup>. The construction of a unitary State, therefore involved standardizing the political-administrative status of localities and systematizing the administration of specific locations.

This concern regarding the systematization of the political framework was not new. The division into Provinces, Municipalities, and Parishes (Church circumscription) was established by the Portuguese colonizer, enshrined in the Constitution of 1824 and already used in the General Census of the Empire. However, as the Republican Constitution of 1891 did not address the distinction between cities and towns, a topic directly related to the differentiation between the urban and the rural, the General Assembly of the National Statistics Council (*Conselho Nacional de Estatística* – CNE), published Resolution no. 59, which suggested that, from 1940 onwards, the censuses would begin to determine the urban and rural populations, distinctly, which "presupposes the prior and precise delimitation of the urban frameworks of the municipal and district headquarters" according to objective and uniform criteria. The resolution also provided "that it be determined that the 'town' and 'city' forums are exclusive to urban centers that are raised to the category, respectively, of district or municipal centers, district or municipal"<sup>8</sup> (p. 371).

IBGE's perspective was the construction of a unified political-administrative framework, which also addressed the vacuum in the definition of urban and rural frameworks, and which still operationally supported the demands for the representation of the Brazilian territory in order to execute the 1940 General Census. All of these requests were covered by Decree-Law no. 311 of March 2, 1938, the so-called "geographic law of the *Estado Novo*"<sup>9</sup>, which was published taking into account both the National Statistics Convention and Resolution no. 59 of the CNE General Assembly and aimed to definitively resolve the limits of the national territory, promote the uniform delimitation of territorial districts, and support the carrying out of the general population census. This instrument clearly reflected the authoritarian bias of the government, threatening municipalities with the loss of the historical principle of autonomy if the adjustments to the territorial framework required by law were not made.

The standardizing criterion adopted in Decree-Law 311 was, firstly, political-administrative, linked to the installation of the city's core and, secondly, quantitative in relation to the

number of houses, without, however, specifying any density or contingency criteria among housing units. And by linking the city and town categories to the concept of the urban, it practically reproduced what was applied in the nineteenth century regarding the Urban Tenth in Rio de Janeiro and other cities, that is, a more operational delimitation for fiscal purposes. One would have expected clearer criteria that would define what the urban phenomenon would effectively be. However, Resolution no. 3 of the National Geography Council of March 29, 1938, brought more specific guidelines on determining the urban and suburban frameworks of cities and towns, through the following delimitation:

1. In the urban area, “the center of greatest building concentration” stands out, where “the main public buildings are located and the commercial, financial, and social life of the city’s core is most intensely manifested”, where, in many cases, “there is an incidence of taxes, such as the urban tenth”.

2. In the suburban area, an “area within which the expansion of the urban area of the city’s core is already taking place or, due to its favorable topographic conditions, is naturally destined for this expansion” 10 (p. 85).

Thus, the official methodology that represents the urban and suburban frameworks, although based on the local management of cities and towns, was also based on a general criterion related to the morphological conformation of urban elements (building concentration) and the built mass (public buildings). In other words, it dialogues with functional aspects linked to the commercial, financial and social life of the city. The suburban framework, in turn, would be linked to areas of urban expansion, including rustic land destined for the future expansion of the city. The remainder of the municipal territory would, by exclusion, be considered rural.

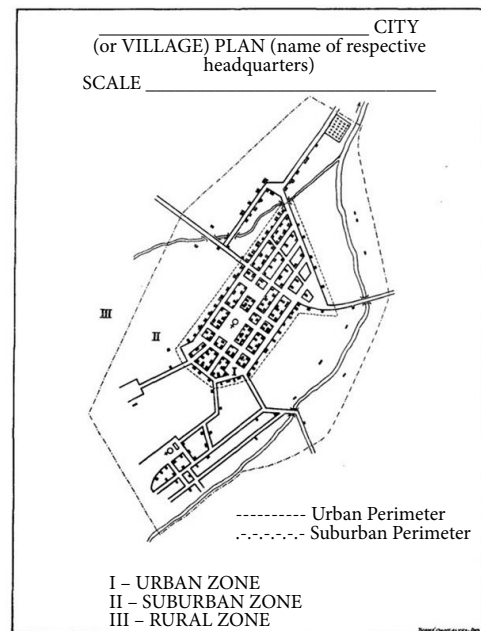
Figure 1 expresses this methodological concept well. It is a schematic plan that should be part of the municipal map. Note that the delimitation of the urban perimeter and, consequently, the urban area is located where the houses are most contingent, demonstrating the morphological character of this classification.

With the 1940 Demographic Census, IBGE began the construction of an operational base made up of the so-called census sectors, initially characterized as: “every portion of the territory, belonging to a single district and delimited in such a way that, within its perimeter, the collection of the demographic census can be fully carried out by a single census enumerator, cumu-

lately, or not, with the collection of another or other censuses”<sup>11</sup> (p. 1).

The sectors were designed to ensure the link of population data to the appropriate territorial districts to which the population would be linked, directly impacting the collection and dissemination of information so that no census sector would cover the territory of more than one district, nor, equally, from more than one of the subdivisions, namely: subdistricts, judicial-administrative zones, and urban, suburban and rural perimeters or frameworks.

Thus, in the 1940 Census, a systematization of data collection and spatialization of rural and urban areas and populations in the country began, which made it possible, in subsequent censuses, to compare the historical series. In this context, the historical importance of Decree-Law 311 is observed, as it establishes a standardization in the delimitation of urban and rural areas in Brazil (and, in a complementary way, to resolution 3 of 1938 of the National Geography Council, which guided such a delimitation to a morphological aspect). However, despite recognizing the role played by such an instrument at the time, it is understood that most of its provisions have fallen into disuse, especially in relation to the Brazilian’s Constitution of 1988, which defined territorial



**Figure 1.** Schematic plan of the city or town – 1940 Census.

Source: Authors.

ordering as an attribution shared by all federated entities.

In the current legal system, municipalities have greater autonomy (and duty) in the delimitation and planning of their respective territories, with greater freedom in the creation of infra-municipal divisions (districts, administrative regions, and the like), zoning and territorial planning, according to article 30 of the Federal Constitution<sup>12</sup>, simply by being aligned with state constitutions and general guidelines established set forth under federal law (such as Federal Law 10271 of 2001 – city statute). Of the 1938 instrument, even though most of its provisions have not been formally revoked (or not accepted), it is understood that, due to the contrast with the new legal system, with the guidelines established in the *Carta Maior* and in federal legislation subsequent to 1988, such devices fell into a scenario of “ostracism”, both in the legal aspect and in the daily life of public policies.

The only exception to this panorama is what appears in articles 3 and 4 of Decree-Law 311, which assign the name “City” to the municipal headquarters and “Vila” to the district headquarters, which is why the IBGE brings, from 1940, such denominations in its methodological series.

The 1950, 1960, and 1970 Censuses followed the classification of census sectors according to urban, suburban, and rural situations, even with criticism of the insufficiency of these categories. Discussions about a better analysis of Brazilian rural space gain strength with the studies of Nilo Bernardes, who drew attention to the need for a more effective approach to those groups of housing that were not “in the condition of town and city”<sup>13</sup>. In this sense, Bernardes proposed classifying rural habitats into forms of dispersion, intermediate forms, and forms of concentration, a distinction that Keller<sup>14</sup> would later summarize as dispersed habitat and concentrated habitat, which configures the origin of the classification of rural census tracts used by IBGE even today. The concentrated habitat, in turn, was subdivided into three distinct categories of settlement: private village *lugarêjo*: small rural settlement *povoado*: rural settlement. This proposal, however, only had an impact on the IBGE’s operational base after the 1980 Census.

The 1970 Census did not bring major advances in the classification of rural areas, but it did in relation to urban areas. In this census operation, special sectors of two types were created: those with collective households with more than 50 people and those in exceptional urban agglomerations. At that time, “urban agglomerations,

generally known as favelas, mocambos, alagados, etc.”<sup>15</sup> (pp. 10-13) were considered exceptional, this classification gave rise to the study that, in 2023, became known as Favelas and Urban Communities<sup>16</sup>.

The 1980 Census was the first to diversify the classification of the situation of census sectors, changing the traditional categories of urban, suburban, and rural to city or town, isolated urban area, rural agglomeration, and rural area. This classification sought to add a locational and positional attribute to the census sectors, so as to facilitate the census operation. Likewise, it was in the 1980 census that census tracts became important as primary or intermediate units of probabilistic sampling surveys. By contrast, geographic studies of a probabilistic nature heavily developed at IBGE in the 1970s, consolidated a line of research in which the elementary unit of work was often the census sector itself<sup>17</sup> (p. 4).

This implied the need to open the enumeration areas grid of census sectors to the most varied demands for knowledge of the territory, without, however, failing to satisfy the demands of the political-administrative framework and the delimitation of urban frameworks by municipal governments, in addition to maintaining the operational viability of census collection. In this sense, the three purposes that the census sectors should serve (and which remain to this day) were managed: operational, conceptual, and legal. The various demands have been developing since the 1940s and ended up being consolidated in a very rich moment in Brazilian geography and IBGE.

### **The urban-rural classification until the 2010 Census**

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In the political-administrative scenario, the discussion on urban areas, and urban and rural expansion, gained strength with two legal instruments: the National Tax Code<sup>18</sup> and the Federal Law that deals with the division of land for urban purposes<sup>19</sup>. The first required that, for tax purposes, the urban zone be defined by municipal law, considering the existence of two requirements among water supply, sidewalks or curbs, sewage network, elementary school, and public lighting. The second determined that “the division of land for urban purposes would only be permitted in urban areas, areas of urban expansion, or specific urbanization, as approved by municipal law” (and Master Plan, based on Federal Law 9785/1999). Such purposes are, however, complementary, because even when a purely fiscal objective is claimed, the urban/rural division “depends on urban planning in accordance with local policy guidelines, as it defines the destination of the soil and the potential value of urban land, whether for construction, expropriation, taxation, subdivisions, preservation, or urbanization”<sup>20</sup> (p. 8).

In the 1991 Census, this classification was also influenced by the book *Mapping for Censuses and Surveys*, published by the United States Bureau of the Census in 1978<sup>21</sup>, which highlighted the problem that city limits, established for administrative purposes, rarely define the actual extent of the urban settlement. Therefore, as a solution, the Bureau of the Census suggested adopting the concept of urbanized areas, distinct from that of urban areas. Thus, the areas defined by the Public Power for political-administrative purposes as urban would be called urban areas, which normally differ from effectively and morphologically urbanized areas, either in terms of construction density or population density, which would thus be called urbanized areas. In census planning, therefore, a new grid of interpretation of census sectors was implemented, initially classifying them between urban and rural, according to municipal law<sup>22</sup> (p. 224).

In the 1991, 2000, and 2010 censuses, the urban sectors were divided into three situations:

- Situation 1: sectors of urbanized areas of a city or town.

- Situation 2: sectors of non-urbanized areas of the city or town, equivalent to the old suburban areas present in the censuses from 1940 to 1970, contiguous to the urbanized areas.

- Situation 3: sectors of isolated urban areas, which would be defined as urban by municipal law, a kind of fragment of the urbanization process including areas reserved for industries and subdivisions.

The rural sectors, in turn, would form five scenarios, classified primarily according to their characteristic of agglomeration or population dispersion:

- Situation 4: urban extension sectors, which would be located outside the legal urban perimeter, such as inhabited subdivisions and housing complexes.

- Situations 5 (villages), 6 (nuclei), and 7 (places) are sectors of isolated rural agglomerations that follow the methodology previously constructed by Fredrich, Brito, and Rocha<sup>23</sup>.

- Situation 8: rural sectors characterized by population dispersion, located outside the urban perimeter, considered a rural area.

This situational classification system of census sectors was used for operational collection, since in the methodology of the 1991 and 2000 censuses the results were totalized only as urban and rural: “The situation can be urban or rural. In an urban situation, areas are considered urbanized or not, corresponding to cities (municipal headquarters), towns (district headquarters), or isolated urban areas. The rural situation covers the entire area located outside the urban perimeter, including rural agglomerations with urban extension, villages and centers”<sup>22</sup> (p. 224).

This understanding remained practically the same in the 2010 census; however, the operational classification, with coding of situation and type, began to be published together with the Results of the Population Census Universe Aggregated by Census Sectors, offering the user the possibility of handling the information<sup>24</sup> (p. 381). From an analytical point of view, the classification methodology into urbanized and non-urbanized urban areas adopted in the 2000 and 2010 Censuses enabled the differentiation of an urban area designed for political-administrative purposes, supported by law (when available) and aimed at the allocation of soil, of an urban other, that which is perceived, experienced, with a morphological basis, and understood as a state of fact. In this way, the urban/rural classification of census sectors gained more importance, con-

figuring a more detailed level of knowledge of the phenomenon, previously limited to municipal sections. Furthermore: the spatial representation of census sectors, according to the urban/rural situation, gave visibility to both urban and rural territorial extensions and the complexity of the network of urban locations in Brazil<sup>25</sup>.

The adoption of the concept of rural agglomeration expanded the possibilities of use and analysis, as this category was home to around 4.5 million inhabitants in 2010<sup>26</sup>. These small nodes dispersed throughout Brazilian rural areas can present different degrees of articulation with the urban network and with the local service network, demanding a series of studies that may reveal hitherto unknown territorial contents. There are plenty of examples of rural settlements that have broad links to cities and towns, that is, they are linked to urban logic, which are very different from cases in typical rural agglomerations.

By contrast, the logic of mapping urban areas underwent significant changes with the advent of Master Plans and new urban policy instruments in Municipalities. This new scenario proved to be quite heterogeneous and, depending on the methodology adopted, could maintain the classic division between urban and rural or create new regionalizations, some very peculiar, which make standardization difficult at a national level. If references to the urban perimeter, created by municipal law, according to the logic of taxation, were frequent, even in IBGE methodological documents, the experience of the 2010 Census showed that the use of such legislation to define the urban and the rural, at a national level, brought quite significant limitations, including:

- Non-existence of the standard in some municipalities. The MUNIC survey indicated that 67.3% of the municipalities declared that they had urban perimeter laws in 1999. In 2001, only 57% of all municipalities in the Northeast Region had urban perimeter laws<sup>27</sup> (p.52). After all, how would the urban population of those municipalities that did not delimit their territory by means of a standard be calculated?

- Divergences between the “state of fact” and the “rule of law”: since the urban zone or urban expansion also deals with the allocation of land, it can contain land of rural dimensions and uses, such as farms and sites intended for subdivision and urbanization in the future; forested areas, whether protected or not; dunes; and mangroves. In other words: the law does not represent the “actual urban”, that is, that which comes from the experience of a lived space, as highlighted by Garcia<sup>20</sup> (p. 9). If the Census seeks to provide a terri-

torial portrait of Brazil, what is defined as “legal urban” may differ greatly from what is observed.

- High incidence of “straight lines” in urban perimeters, which can cut through localities and even clusters, colliding with the operational criteria used by the IBGE to delimit census sectors.

- How effective is the local urban dynamics standard? Is it updated? How accurate are your descriptions, maps, and plans? What methodology was used? What are the motivations and interests involved? During the work to update the Territorial Base, it was not uncommon to find housing complexes licensed by the municipality and located outside the current urban perimeter law.

It can therefore be concluded that, if, on the one hand, municipal legislation is an important source to understand municipal territorial planning, on the other hand, it cannot be the final word on such a complex subject, either due to its own limitations and specificities or because these are not the only ways of understanding the urban phenomenon and its dynamics.

### **Adjustments to the urban x rural classification methodology in the 2022**

#### **Census**

Since the first census, the IBGE began to maintain a set of information, called the Territorial Base, organized in registers and maps, capable of depicting, at appropriate scales, the diversity of arrangements that make up its political-administrative configuration and other geographic levels through which the capture and dissemination of statistical information becomes feasible. As published on the IBGE website:

*It is the spatial information system, designed to support the collection and dissemination of statistical data. The network of census sectors is formed by a graphic base of georeferenced information, by representations of territorial structures (political-administrative division, cities, towns, indigenous groups, and of a wide range of other spatial elements) and integrated into a set of alphanumeric registers (geocodes), maintained in a decentralized manner through the territorial database's registration banks and graphs<sup>28</sup>.*

The main objective of the Territorial Base today is to organize this set of georeferenced information, as well as to develop solutions that offer territorial sections that are consistently more suitable for capturing and disseminating geographic and statistical information. Its structure consists of a graphic base of georeferenced information that contains the representation of ter-

ritorial structures related to the country's political-administrative division, census sectors, and other cartographic and thematic elements that may be relevant to the various stages of construction of geographic studies or reference statistics. In this sense, there is a key concern regarding the patterns of concentration and dispersion of the units to be visited during the study, seeking efficient, well-defined census sectors that make the enumerator's work feasible and that are also coherent with the expected time necessary for data collection in the field.

This operational demand, supported by registration methodologies and the number of households, as well as attentive to the conditions of field research, such as the census taker's route and accessibility to places and public places, forms a kind of triad with the conceptual and legal demands. The need to meet this triad generates certain constraints in analytical terms, but it also has potential. If criteria supported by legal delimitations, in many cases, do not allow for the correct identification of spatial typologies, such as urban and rural, they do, by contrast, allow for the extraction of data by administrative structures and, subsequently, provide support to public policies. In this context of complexity, each of these demands requires not only attention, but also recognition of its own limitations. Therefore, the methodological review work of the Territorial Base that supported the 2022 Census sought to reconcile legal, conceptual, and operational demands, supported by a review of work processes and the use of new technologies. Once the morphological analysis was prioritized, the classification of census tracts needed review, especially in those situations most affected by outdated information or inaccuracy of the local perimeter or urban zoning legislation, as compared to recent, high-resolution images.

The images were also useful in reviewing the boundaries of sectors, especially in cases of straight or imaginary lines, tolerated only due to political-administrative limits or in cases of sectors of rural agglomerations where it was not possible to identify stable physical elements, such as rivers, roads, etc.

All of this was carried out by 2021, in time to support the preparation of data collection, either through maps in different scales and according to sections of the most diverse territorial structures, such as Indigenous Lands and *Quilombola* Territories. The maps of the census sectors were produced in two ways: a) as digital and analog maps containing the respective limits, streets, and essential cartographic information and b) represented on the highly detailed orbital image,

accessed both on the census worker handheld computer and on data collection monitoring systems at IBGE.

The sectoral mesh of the 2022 Census, with the necessary adjustments resulting from situations arising from data collection itself, will still be released. Meanwhile, the 2021 sectoral grid and the 2022 Geographic Framework are now available for download on the IBGE website, and it is now possible to carry out spatial analyses of the sectoral grid that were taken to the field, together with the census takers.

From the point of view of the situation (urban/rural) of the census tracts, this review resulted in the new conceptual framework, as shown in Chart 1.

This new situational framework, in addition to bringing two new categories: urban core and water bodies, redefined procedures for interpreting the areas surrounding cities and towns, confronting the legal demarcation with field observations and image analysis. In the case of old isolated urban areas and rural agglomerations of urban extension, situations 3 and 4, respectively, in the previous Census, the prioritization of morphological analysis led to the fusion of the two situations into a new one, of urban isolated settlement, as shown in the Table in Chart 2, which brings a comparison between the classifications used in the 2010 and 2022 Census, with the respective number of sectors for each situation.

Based on this conceptual adaptation, situation 3 no longer depends on municipal legislation, as long as it presents morphological characteristics of subdivisions, "horizontal condominiums", and even favelas and urban communities. Situation 4, of rural agglomerations of urban extension, was added to the new situation 3, of urban nuclei, since they were subdivisions, condominiums, and even urban communities, counted as rural in the previous methodology for the simple fact that they are outside the urban perimeter.

Thus, the new situation 3 of urban centers now meets the following criteria:

- Defined as urban by municipal law, effectively occupied and located far from cities and towns;
- Settlements with urban characteristics, such as residential condominiums, subdivisions, and housing complexes, favelas and urban communities, even those located outside the urban perimeter.

To conclude, the main guideline for urban/rural classification in the 2022 Census sectoral grid was to prioritize, initially, analyses carried out using high-resolution images. Municipal leg-



**Chart 1.** Situations of the census sector demographic census in 2022.

Situation	Code	Definition
Urban area with high building density	1	Urban area with regular or organic squares, blocks, with high building density and visible lots.
Urban area with low building density	2	Urban area with low building density, processes of urban expansion and fragmented occupation, uninhabited green areas, among others.
Urban nucleus	3	Áreas urbanas isoladas e aglomerados rurais de extensão urbana (conforme definição da metodologia anterior) que estejam descoladas da área urbana. Inclui também conjuntos habitacionais e condomínios mesmo que em áreas consideradas rurais
Town	3	Isolated urban areas and rural settlements in the urban outskirts (according to the definition set forth by previous methodology) that are separate from the urban area. Also includes housing complexes and condominiums even in areas considered to be rural.
Rural nucleus	5	Rural settlement with no private or corporate features, that is, not linked to a single land owner and characterized by the existence of commerce and services.
Hamlet	6	Isolated rural settlement linked to a single land owner (company, agriculture, agro-industry, plants, etc.)
Rural area – only settlement	7	Isolated rural settlements that do not have the urban services and equipment that define a town and that are not linked to a single land owner.
Bodies of water	8	Areas of rural use characterized by the diffusion of households and by the usual presence of agriculture and cattle raising establishments.
Bodies of water	9	Bodies of water that correspond to rivers, estuaries, bays, lagoons, lakes, reservoirs, etc., which, for operational reasons, establish the sectorial boundaries.

Source: Authors based on IBGE<sup>29,30</sup>.

**Chart 2.** Comparative table of census sector situations,

Code	2010 Census		2022 Census	
	Description	Sector	Description	Sector
1	Urbanized areas of city or village	229,781	Urban area of high building density	306,095
2	Non-urbanized areas of city or village	7,161	Urban area of low building density	31,869
3	Isolated urban areas	3,440	Urban Nucleus	7,682
Total	URBAN	240,382	URBAN (situations 1, 2, 3)	345,646
4	(situations 1, 2, 3)	1,610		
5	Rural settlement in urban outskirts	9,260	Town	16,832
6	Rural settlement – town	246	Rural nucleus	295
7	Rural settlement – nucleus	1,306	Hamlet	5,010
8	Rural settlement – hamlet	63,770	Rural area – only settlements	83,569
Total	Rural area (situations 4, 5, 6, 7, 8)	76,192	RURAL (situations 5, 6, 7, 8)	105,706
9			Bodies of water	894

Source: Authors based on data from the Territorial Base via corporate systems.

isolation – especially Master Plans and Macrozonings – remained an important input to help identify consolidated and expanding urban areas, but conditioned on morphological and operational criteria, that is, avoiding dry lines and paying attention to the number of households, maintained from the 2010 Census.

In addition to the situation of the census sector, which addresses urban and rural issues, the classification according to the type of census sectors meets, as a priority, operational collection criteria. This resource is applied in areas with restricted access or that require a different route, approach, and interview procedures. Their iden-

tification is generally made from administrative records collected from responsible governmental agencies, but they may also require field work. Figure 2 presents a summary table of the situations and types of census sectors in 2022:

This typology of census sectors stemmed from the analysis of their internal compositions, which can interfere with census collection procedures, either because they are collective households, or because they contain specificities in the population group or in access to households. Many of these categories will be the subject of specific IBGE publications, as in the cases of type 1 – Favelas and Urban Communities and those related to traditional peoples and communities, such as types 5 and 9, respectively, indigenous and *quilombola* groups.

The result of this methodological review of the urban and rural categories in the 2022 Demographic Census, applied to the census sector network through a geographic information system (GIS), can be seen in the cartogram in Figure 3, which shows a section of the surroundings of the Metropolitan Region from Goiânia, GO, Brazil.

In the cartogram in Figure 3, a greater fragmentation of urban areas can be seen, due to the

existence of areas of effective rural use, included in the urban perimeter. According to the new methodological guidance, these fringes of urban expansion were only classified as such if, in fact, they contained subdivisions or urban occupations, albeit fragmentary. Otherwise, they move to situation 8 of a rural area that are exclusive to agglomeration.

## Conclusion

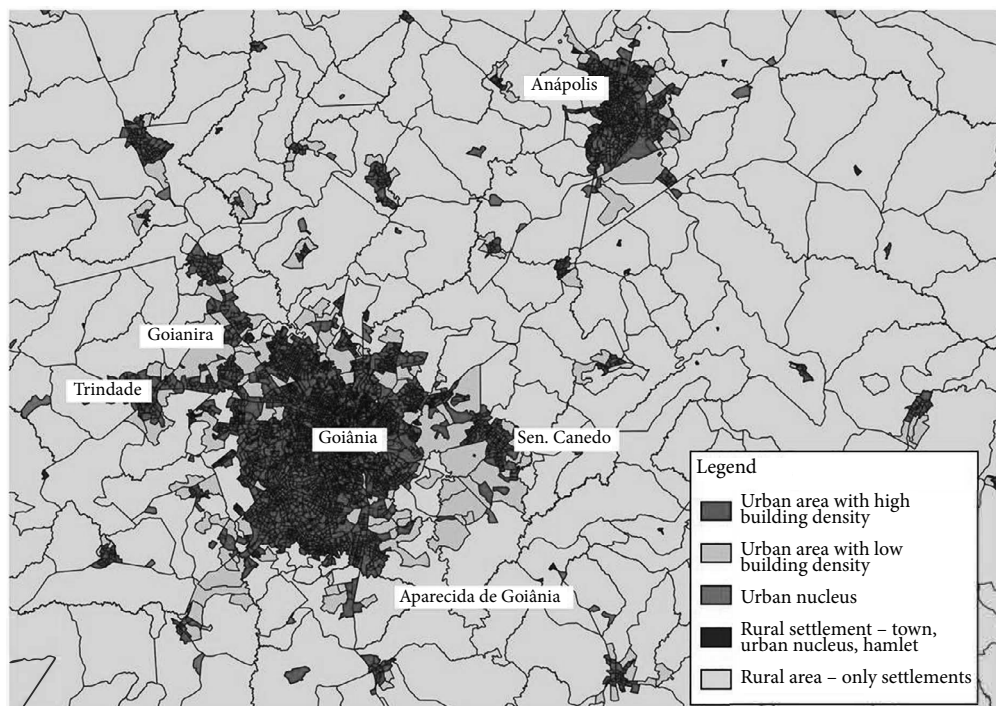
The methodological review discussed in this article, despite the technical innovation in the use of high-resolution orbital images (not available in the preparation of previous censuses) is, in fact, the result of a historical process of understanding the national territory consolidated in a context of institutional culture. In nearly all Censuses, the IBGE invested in new techniques and procedures that required methodological adjustments and, at times, overcoming paradigms. The difference brought by the methodological review in the work of preparing the Territorial Base of the 2010 Census for the 2022 Census was a critical evaluation of the concepts adopted until then, especial-

SITUATIONS		
URBAN		
1	High building density	2 Low building density
3	Urban nucleus	
RURAL		
5	Town	6 Rural nucleus
7	Hamlet	
8	Only settlement	
SITUATIONS 5, 6, AND 7: RURAL SETTLEMENTS		9 Body of water

TYPES		
1	Slums/favelas and urban communities	4 Low household level
2	Military base barracks	5 Indigenous settlement
3	Accommodation Camp	6 Prison units
7	Hospital, convent, ilpi, iaca	
8	PA agrovillage	
9	Quilombola settlement	
TYPE 0: NO SPECIFIC CLASSIFICATION		
OBS: ILPI - long-term care institutions for the elderly, IACA - care institutions for children and adolescents		

**Figure 2.** Summary table of situations and types of census tracts in 2022.



**Figure 3.** Cartogram with classification of census tracts in 2022, Goiânia, Anápolis, and Surrounding Regions.

Source: Authors based on data from the Territorial Base via corporate systems.

ly regarding the role of municipal legislation in defining the urban and the rural for an operation that intends to portray Brazil.

In fact, the use of geotechnology enabled the analysis of the census tract grid, in vector format, in high-resolution images. This resource allowed prior work to identify cases that required field verification and/or review of the sector's classification and representation. This stage of diagnosing the Territorial Base, carried out in an office and decentralized by the regional superintendencies and IBGE agencies, through geotechnology solutions developed at the institute itself, was organized according to the municipality cut-off, except in those with a large population size, where the cut-off was done by district or even sub-district.

In turn, the use of high-resolution images allowed a first perception of the constructed, lived space, which in most cases distances itself from the legal space, more focused on the destination of the land than on its effective use. With this, the spatial form, brought by the understanding of elements of the physical environment, such as

streets, paths, land, fences, buildings, cultivated fields, dunes, and forests, in addition to helping in planning collection routes, has reinforced the importance of the search and geographic weight in statistical research.

### Collaborations

AL Souza, FS Damasco, GBFPS Medeiros and RC Garcia: research, text and review.

### Acknowledgements

The authors would like to thank the team of employees, technicians, collaborators, and interns of the Coordination of Territorial Structures of the Geosciences Directorate and the valuable Territorial Base teams in the 27 State Superintendencies and their respective Agencies: an effort the size of Brazil!

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Article submitted 26/02/2024

Approved 09/04/2024

Final version presented 11/04/2024

Chief editors: Maria Cecília de Souza Minayo, Romeu Gomes, Antônio Augusto Moura da Silva