

Eurostat methodology applied to the characterization of rural and urban Brazilian spaces

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Abstract. The Brazilian official statistics show that the country is mainly urban, while authors including Veiga (2002) and Miranda and Silva (2013) present a more rural Brazil. The absence of a uniform way to define the rural areas in Brazil has led to diffused data about rural Brazil's size. Therefore, are Brazilian regions predominantly urban, rural or intermediate? This paper applies the rural definition methodologies from Eurostat/European Union to the municipalities of Brazil. The results show the predominance of the intermediary category in Brazilian territory, while the population mostly lives in urban areas. However, due to methodological characteristics, this paper reinforces the necessity of developing other methodologies which would be able to identify rurality and urbanity, considering socioeconomic dimensions.

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1. Introduction

Rural societies have been subjected to deep transformations around the world. In Poland, for example, several demographic changes have affected rural areas (Biegańska, 2013). The rise of non-agricultural rural properties points to new socioeconomic alternatives. These economic alternatives improve access to house amenities and new technologies in rural areas. This phenomenon has changed the life of people who live in rural areas. In this scenario, the differences between rural and urban are more difficult to observe. Therewith, a universal definition of rural seems a step too far. Determining what is rural (and urban) is a complex issue in modern geography, as demonstrated by Brauer and Dymitrow (2014).

Mazorra and Hoggart (2002) evidence that questions such as “What is rural?” have been consistently emerging throughout the twentieth century. In the mainstream approach, according to Endlich (2010), rural is dispersion and urban is agglomeration. Also, Endlich (2010) criticizes population density to answer this question.

For Schmitt and Goffette-Nagot (2000), the most common definitions continue supporting polarizations between urban and rural. That occurs due to purely empirical criteria, and rural areas remain defined by low population, scarce buildings and agriculture.

Some authors, like Mills (1988), believe that defining rural is a fool’s errand. But Mills (1988) sees the necessity to identify “shades of urban” in the countryside. Since the late seventies, Cloke (Cloke, 1977; Cloke and Edwards, 1986; Cloke and Milbourne, 1992; Cloke, 2006; Cloke, 2013) has sought how to set the rural concept. In 1977, he created a rurality index for England and Wales, which was a seminal study in this area. He aggregated dimensions relative to demography and to lifestyle in his index. He demonstrated that the rural spaces cannot be defined only by demographic density.

In Brazil, the literature discussion aimed at defining rural has also revealed the dissonances found worldwide. Veiga (Veiga, 2002) stated that Brazil was more rural than he imagined, in agreement with Miranda and Silva (Miranda; Silva, 2013). He defended the necessity to differentiate Brazilian city

types, in terms of: “Rural Cities”, “Urban Cities” and “Megacities”. However, Veiga (2002) has been criticized by geographers and social scientists, including Braga (2015) and Kageyama (2004). They argue that the indicators used, such as population density, population size, and distance from urban centres, characterize only physical aspects. Indeed, Veiga (2002) ignored the trend to define rural as a “lifestyle”, as indicated by Ögdül (2010).

In this scenario, Brazil, for example, does not have a unique rural or urban definition. Local authorities in municipalities determine, with their own legislation, which rural areas must be considered. This brings several distortions in Brazilian territory. Areas with similar socio-economics characteristics in different municipalities may be urban or rural.

The European Union is experiencing a similar scenario in its member countries. Eurostat, the European Union statistical agency, is trying to solve this issue with an urban-rural regional typology used by the member countries. This typology has three categories, namely: Predominantly Urban, Intermediate, and Predominantly Rural.

This paper aims to apply the Eurostat regional typology to the Brazilian territory. This application might support public policies in Brazil, especially in rural development. Besides, a European methodology might help Brazilian legislators to create a uniform way to define the rural area.

But, what is rural? This simple question has several answers in scientific literature. According to Jones (1995), the word “rural” is not commonly used in lay discourses, and the ‘country’ and ‘courtyard’ concepts are more frequent. However, for Jones (1995), lay discourse mixes with academic discourse. In this approach, the term “rural” is complex and contradictory.

2. Rural Definition

Mazorra and Hoggart (2002) pointed out that the question “What is rural?” has been used in sociological and geographical literature throughout the 20th century. Halfacree (1993) set forth that classical sociologists, including Weber, Durkheim, Becker, and Maine, have indirectly tried to categorize

the urban and non-urban society. This concern was demonstrated in other areas, such as economics and philosophy. In all areas of knowledge, the rural construct does not have a single clear definition. Indeed, Coca et al. (2012) argued that the definition of rural cannot be construed through Boolean logic. It is necessary to make use of fuzzy logic to understand the rural.

Despite the multi-variant rural definition, several authors have endeavoured to group the rural definition approaches. Diniz (1996) segmented the approaches in three groups according to their emphasis on certain criteria: occupational, socio-cultural, or ecological. Alternatively, Mazorra and Hoggart (2002) defined the lines of research on the said definition according to the methodology used: quantitative, qualitative, or flux-based. This last approach sees rural and urban as opposed images. The terms are defined by social relationship, environment, health, and lifestyle.

Bengs and Schmidt-thomé (2006) also classify the rural definition approaches. They synthesized four research lines: implicit definitions; statistically derived policy-relevant differentiation of rural areas; statistically derived index of rurality; and neutrally defined rural delimitation. The implicit definition approach is based on intuitive ideas about rural or empirical evidences. These ideas are commonly used by public agencies and international organizations, like OECD (1994; 2009; 2010; 2013a; 2013b; 2013c) and the European Commission / Eurostat (2013).

Meanwhile, the researchers that identify with the “statistically derived policy-relevant” differentiation of rural areas distinguish urban and rural with a quantitative-exploratory study. These authors, such as Malinen (1995), tried to select the variables under a theory. This approach generally uses quantitative methodology techniques, including cluster analysis and factorial analysis.

Bengs and Schmidt-Thomé's (2006) third approach includes the authors that create rurality indexes. Several authors take part in this research line, which includes studies for America (Waldorf and County, 2007), Asia (Long et al. 2009), Africa (Schlesinger, 2013) and Oceania (Humphreys, 1998). However, these indexes are mainly concerned with European Countries and use statistical methodology (Braga, 2015). The main author in this ap-

proach is the British researcher Cloke (1977). Cloke (1977) performed a seminal study on rurality indexes in England and Wales, as previously mentioned.

The last approach described by Bengs and Schmidt-Thomé (2006) is the neutrally defined rural delimitation. This research line is commonly used as a preliminary study. The neutrally defined rural delimitation uses univariate statistics and focuses on variables relating to population density and accessibility.

Countries all over the world do not have a single official definition of rural spaces, either. However, it is generally possible to detect similarities among countries, and they are mostly connected to an implicit definition line, proposed by Schmidt-Thomé (2006).

The IPUMS-International project collects descriptions of rural definitions made by official statistical agencies of numerous countries. These countries are presented in Table 1, and, they are to group the similarities for the official rural definition according to the criteria used. Thus, seven variable groups were found that might be included in most rural definition criteria. These groups are:

Demographic level – it concerns variables relative to the number of inhabitants that live in the single area of settlement;

Demographic density – it includes demographic density variables;

Administrative definition – the public authority arbitrarily defines the limits between rural and urban, Or, equally arbitrarily, the public authority determines the exception rules to the rural/urban definition;

- Agricultural activities – variables linked to agricultural GDP and/or the proportion of economically active population undertaking agricultural activity;
- Land use – variables relative to land use;
- Access to public services – it concerns variables corresponding to access to public service, like garbage collection;
- Employed population – percentage of the economically active population currently employed.

Table 1 presents the main criteria that countries used to define the rural spaces.

Table 1 presents several countries that use more than one criterion of classification, as demonstrated

by Nagy (2009). For example, Chile uses the combination of two criteria to define rural areas. This country joins the demographic level and agricultural activity and/or agricultural work. From the year 1992 to 2002, an agglomerate was considered a Chilean urban area if it had at least 2000 inhabitants or between 1001 and 2000 inhabitants, with more than half of its economically active population not working in the agricultural sector. Thus, Chile is aligned with traditional definitions, as pointed out by Kageyama (2008). This author considers the traditional vision of rural as a predominantly natural environment, in which agricultural activities are carried out.

Cameroon defines rural based on a mix of demographic levels, administrative definition and access to public services. In that African country, the expression “rural village” must be accepted by people. This criterion reinforces the sociological dimension of rural, ignored by several countries.

Summing up, all countries has shown different criteria to define rural. However, despite such diversity, there has been a trend to incorporate a demographic density indicator. Hence, this indicator was included in the international rural typology, such as Eurostat and OECD regional typology.

3. Materials and research methods

The European urban-rural typology has been used for transnational comparison by member countries. Nevertheless, every country has maintained its own definition of rural and urban areas. Portugal, for example, has a rural-urban typology called TIPAU “Tipologia de áreas urbanas” (Urban Areas Typology) (Instituto Nacional de Estatística, 2014).

Eurostat methodology was based on the OECD regional typology. The OECD typology uses population density to characterize a region as mainly urban or rural. It includes three categories: Predominantly Urban, Intermediate, Predominantly Rural. This classification has three steps.

Firstly, it identifies localities with less than 150 inhabitants per square kilometre. These places are considered rural areas. Secondly, TL3 Regions (Territorial Level 3) are classified as Predominantly Urban, Intermediate, or Predominantly Rural. A

region is set as Predominantly Rural if more than 50% of its population lives in rural areas. If less than fifty percent of a population lives in rural areas, this region is considered Predominantly Urban. Intermediate regions are described as those where 15% to 50% of the population lives in rural communities (OECD, 1994; 2009; 2010; 2013a; 2013b; 2013c).

After the first classification, the TL3 Regions are submitted to the last OECD typology criterion. The areas may be reclassified according to the size of their urban centres. If a certain region, firstly classified as Predominantly Rural, has an urban centre with more than 200,000 inhabitants (500,000 for Japan) representing no less than 25% of the regional population, it is reclassified as an Intermediate region. Likewise, Intermediate regions with an urban centre with more than 500,000 inhabitants (1 million for Japan) representing no less than 25% of the regional population are reclassified as Predominantly Urban regions (OECD, 1994; 2009; 2010; 2013a; 2013b; 2013c). Figure 1 presents the OECD regional typology.

The European typology, similar to that of the OECD, uses demographical density as the main criterion. However, there are several differences between the European methodology and the OECD typology. The first difference is the use of a cut-off in the form of 300 inhabitants by square kilometre to consider an area urban, twice the value of the OECD criterion. In addition, urban areas must have at least 5,000 inhabitants, a criterion that does not exist in the OECD typology (European Commission, 2013; OECD, 2010).

Another important distinction between the methodologies is the aggregation data. While the OECD uses Local Administrative Unit Level 2 (LAU2) data, Eurostat uses grid cells of 1 square kilometre. Moreover, the European methodology has amended the cut-off to set a region as Predominantly Urban. The OECD considers regions Predominantly Urban if less than 15% of their inhabitants live in rural areas. The Eurostat typology sets a region as Predominantly Urban when less than 20% of its population dwells in rural areas. These differences might change the results, since regions classified as Predominantly Rural by the OECD might be considered Predominantly Urban by the European classification (European Commis-

Table 1. Criteria used to define the rural

	Demographic level	Demographic density	Administrative definition	Agricultural activities	Land use	Employed population
Argentina	X					
Armenia	X		X	X		
Belarus	X				X	
Bolivia	X	X				
Brazil			X			
Cambodia			X			
Cameroon	X		X			X
Canada	X	X				
Chile	X			X		
Colombia			X			
Costa Rica		X		X	X	X
Ecuador			X			
Egypt			X			
El Salvador	X		X			X
Fiji *						
France	X					
Ghana	X					
Guinea			X			
Haiti			X			
Hungary			X			
India	X	X		X		
Indonesia**						
Iran			X			
Iraq			X			
Ireland	X					
Israel	X					
Jamaica	X				X	X
Jordan	X					
Kenya	X					
Kyrgyzstan	X		X	X		
Malawi			X			
Malaysia	X					
Mali	X					
Mexico	X					
Nepal	X					
Nicaragua	X					X
Pakistan			X			
Palestine	X		X			X
Panama	X					X
Peru	X		X			
Philippines	X					

Table 1. Continuation

Portugal	X		
Romania	X	X	
Rwanda		X	
Senegal	X		
Sierra Leone	X		
Slovenia	X		
South Africa			X
Southern Sudan	X	X	
Spain	X		
Sudan	X		
Tanzania		X	
Thailand		X	
Uganda	X		
USA	X		
Uruguay***			
Venezuela	X		
Vietnam	X		X

* Fiji considers urban such inhabitants that live in a “city”. However, the country does not define “city”.

** Indonesia defines an urban area as a place with present urban characteristics.

*** Uruguay, similarly to Fiji, defines urban population as the people that live in “cities”.

Source: Elaborated based on Minnesota Population Center data (2013)

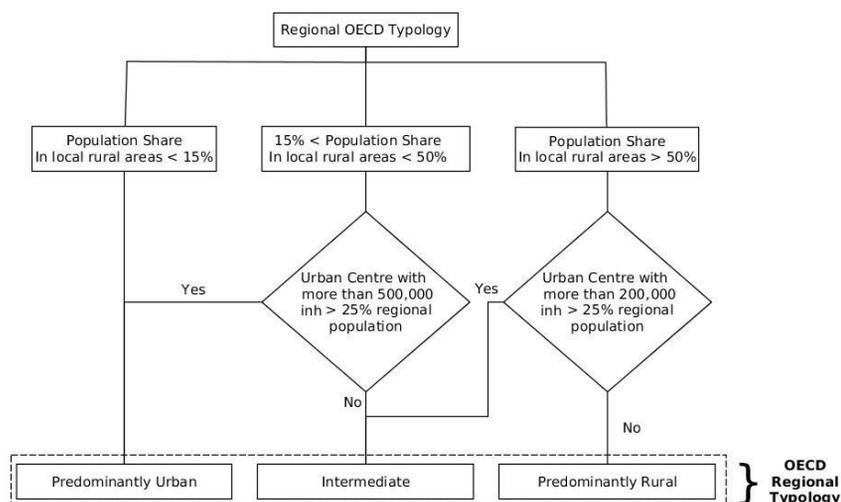


Fig. 1. OECD Regional Typology
Source: Based on Brezzi, Dijkstra and Ruiz (2011)

sion, 2013; OECD, 2010). Figure 2 presents a synthesis of Eurostat methodology.

These changes in the OECD and Eurostat typologies were made for two main reasons. Firstly, the changes might mend distortions due to the wide variation of Local Administrative Units level 2 (LAU2) areas. Braga et al. (2016) demonstrated that Brazilian municipalities, the Brazilian LAU2, present a larger variation than OECD countries. In-

deed, Brazilian LAU2 can be larger than European countries, as in the case of Altamira in the State of Pará, has 159,533.3 km², or smaller than European villages, as with Santa Cruz de Minas in the State of Minas Gerais, with 3.5 km² (IBGE, 2017). Thus, this alteration might improve the regional typology in the Brazilian territory and revise any overestimation of Brazilian urban population.

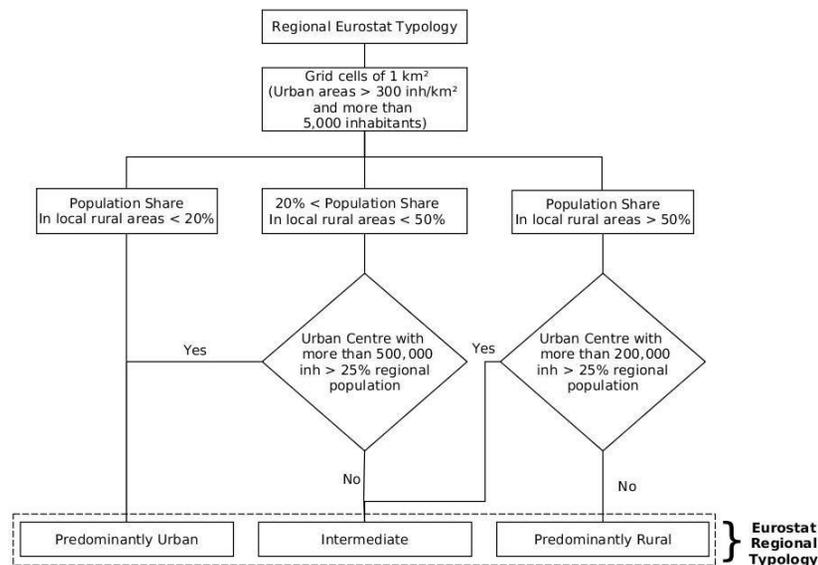


Fig. 2. Eurostat Regional Typology
Source: Elaborated by the authors

The second issue is the wide variation in the surface area of NUTS 3 regions and the practice, in some countries, to isolate a (small) city centre from its surrounding region. In this regard, Brazil has similarities with European countries. The Brazilian NUTS3 (The Brazilian *mesoregions*) have variations like those found in LAU2. Nevertheless, Brazilian municipality boards are defined administratively, which might separate a city centre from the surrounding region (Braga et al. 2016).

Therefore, this paper applies the Eurostat regional typology to Brazilian territory and investigates the limitations and potential of Brazilian application.

4. Results

This research was applied to the Brazilian territory using a cross-section in the year of the last demographic census, 2010. Therefore, the research universe is composed of 190,822,750 inhabitants, 67,569,688 households in 5,565 municipalities, 26 States and the Federal District (IBGE, 2013a, b, c).

In the application of the Eurostat regional typology at Brazilian level, it was impossible to obtain data from grid cells of 1 square kilometre in the

Brazilian census data. Therefore, this research used the most disaggregated Brazilian census level data, the *setor censitário*. The *setor censitário* is a continuous territorial unit with a dimension that allows survey to be applied by only one census taker. This area must be inserted only in urban or rural official surface (IBGE, 2013a, b, c). Thus, *setores censitários* have similar areas. The using of *setores censitários* can fix the distortions by the large variation of Brazilian LAU level 2, the Brazilian municipalities. Thus, results are not expected to present substantial bias.

According to the Eurostat regional typology, an urban area needs up to 300 inhabitants per square kilometre and, simultaneously, more than 5,000 inhabitants continuously (European Commission, 2013). This criterion is used in the Brazilian application. The *setores censitários* were considered continuous if these showed a presence at least one border among them. The results of the Brazilian application are presented in the Figure 3.

Figure 3 presents Brazil with 68 TL3 regions classified as Intermediate (49.6%), 42 as Predominantly Urban (30.7%), and 27 as Predominantly Rural (19.7%). The percentage of predominantly rural regions in Brazil is smaller than in Europe (European Commission, 2013). The States of Ceará, Piauí, Acre and Roraima have only one TL3 region not classi-

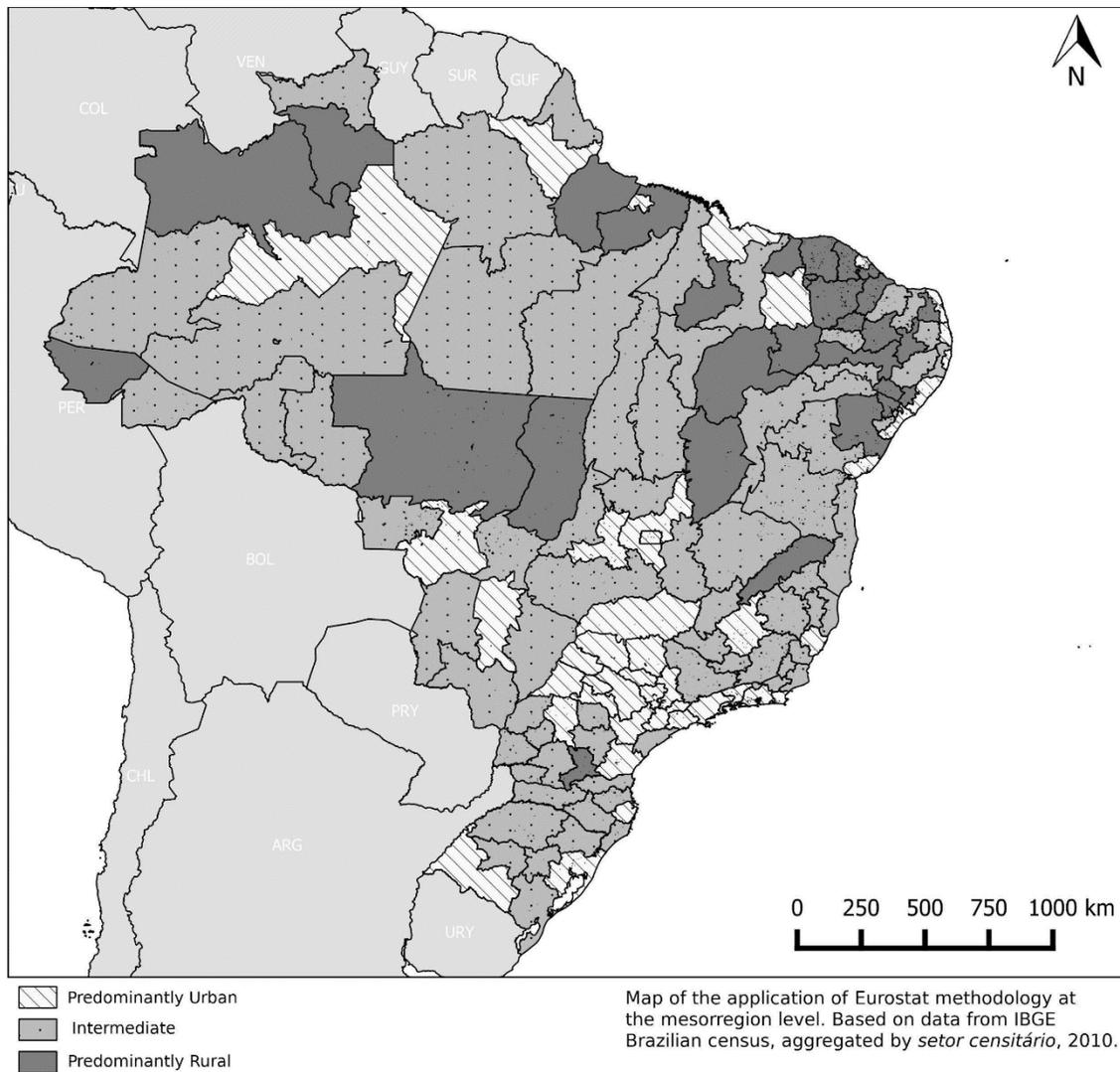


Fig. 3. Eurostat regional typology applied to the Brazilian territory
Source: Elaborated by the authors, based on IBGE data (2013a, 2013b)

fied as Predominantly Rural. However, the State of São Paulo has all TL3 regions classified as Predominantly Urban, except the *Litoral Sul Paulista*.

Braga et al. (2016) applied the OECD typology to the Brazilian space. This study detected only one Predominantly Rural TL3 region in Brazil. These results evidence the contrasts between OECD typology and Eurostat typology.

Indeed, the south-central Brazilian region, the most economically developed, has only two regions considered Predominantly Rural: Jequitinhonha and Sudeste Paraense. The TL3 regions classified as predominantly urban are located in south-central Brazil and in the capitals of the northeast and the Amazon. This is corroborated by Cavaco (2004) and

Braga (2015), who demonstrated the occurrence of a vacuum of urban regions in Brazil, mainly in the north and northeast. This contradicts the official Brazilian classification, that shows a high level of urbanization in all Brazilian regions. These results reflect the Brazilian historical urbanization, centred in these places (Deák and Schiffer, 1999).

According to Eurostat criteria, 78.2% of Brazilian inhabitants live in urban areas, while the official data reports that 84.4% of Brazilian inhabitants are urban. The European criteria sort the Brazilian territory as slightly more rural, despite the recent Brazilian urbanization. In the 1940s Brazil was a rural country, and by the 1970s its official urban population had nearly tripled. At this moment, Brazil

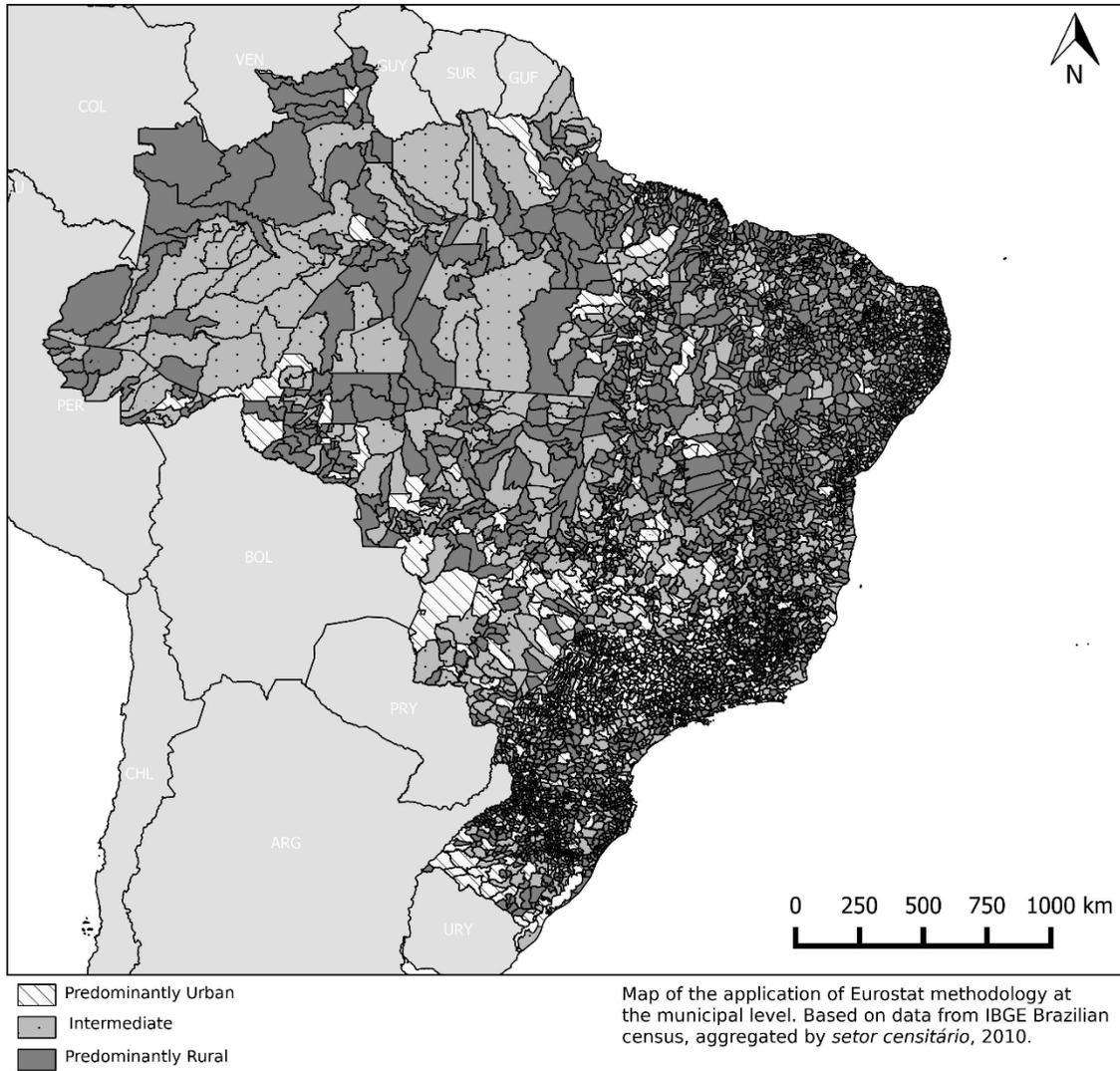


Fig. 4. Eurostat regional typology applied to the Brazilian territory at municipality level
Source: Elaborated by the authors, based on IBGE data (2013a, 2013b)

is officially a predominantly urban country. In the following decades, the urban population will keep increasing. Cities with a population between 250 thousand and 2 million inhabitants have been gaining importance in a process of metropolization of the Brazilian population. In 2010, 84.35% of the official population were living in urban areas (Deák and Schiffer, 1999; IBGE, 2013).

However, the Eurostat typology does not present Brazil as rural, as Veiga (2002) and Miranda and Silva (2013) do. Often, Brazilian TL3 regions are larger than the European TL3 regions. Thus, this research applied the European methodology at municipality level. Figure 4 presents the results obtained from the application of the methodology at municipality level.

In opposition to the application at TL3 level, the application at municipality level shows Brazilian municipalities as Predominantly Rural. This may be true to most Brazilian municipalities with less than 5,000 inhabitants. This population level is a condition for predominantly urban municipalities. The following results were obtained: 3,179 Predominantly Rural municipalities (57.1%), 1,387 Intermediate municipalities (24.9%), and 999 Predominantly Urban municipalities (18%). Northern and north-eastern Brazil are more rural than south-central Brazil, but all municipality classifications can be found in all states.

At this level of disaggregated data, it is possible to see the “imaginary cities” (*idades imaginári-*

as) proposed by Veiga (2002; 2004). However, the paper results are far from the 80% of Brazilian cities pointed by the author. According to the Eurostat criteria, Brazilian population is 78.2% urban, against the two-thirds pointed by Veiga (2002;2004).

5. Conclusions

Although the expression “rural” is related to a calm place, with relatively natural landscapes, and low demographic density, its definition is still unclear. The scientific literature and international organizations are making efforts to clarify the concept of “rural”. However, no consensus has been achieved yet. The European Commission, through Eurostat, endeavoured to create a methodology able to define predominantly rural and urban areas. Thus, Eurostat adopts the implicit definition approach developed by Bengs and Schmidt-Thomé (2006).

The European methodology was inspired by the OECD regional typology. It sought to improve the OECD methodology using a different level of disaggregation data and stipulating the minimum of 5,000 inhabitants for an area to be classified as urban. In the Brazilian territory, the Eurostat typology presents results different from those of the OECD typology (Braga et al., 2016), although the method basically uses population density to measure rural areas. Indeed, both methods do not use socioeconomic variables to define the rural-urban regions.

Eurostat methodology applied to the Brazilian territory classifies the country as Intermediate, with most of its population living in urban areas. This result differs from the official Brazilian statistics, which rank Brazil as mostly urban. Some authors, including Veiga (2002, 2004), consider Brazil as mainly rural.

The European methodology has several limitations, including the disregard for the social dimension of rural. It uses only two variables to define a rural area. Understanding rural as more than a populational settlement is a trend in literature (Figueiredo, 2012; Fiúza; Pinto, 2012; Ögdül, 2010). Further studies shall circumvent these limitations, with a methodology that uses other variables to define the rural environment, considering its social dimension, like access to household amenities and time spent

to travel to major cities. These variables widen the concept of rural, since the term denotes not only a demographic void, but also a socially constructed geographic space. In addition, future research shall aim to understand how the Brazilian urbanization processes has led to this scenario.

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