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Papers

Land-ownership structure in Bahia, Brazil: an analysis from the perspective of the Gini Index

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Abstract
High concentration of the ownership of land is a phenomenon explained by the agrarian history of Brazil. The possession and use of land in Bahia, and throughout Brazil, reveal the antagonism produced by the relationship between the peasants and a dominant class composed by the landowners, involving subordination, expropriation, and exploitation. In this context, this study analyzes the land-ownership structure in place in Bahia, with the aid of the Gini Index (GI) for the land and the spatial clustering technique, from data of censuses 2006 and 2017 for the 417 municipalities of Bahia. According to the GI results obtained and the classification applied, it was identified a significant land concentration in Bahia, albeit with a moderate reduction between 2006 and 2017. According to the spatial analysis, clusters with high land concentration are mostly found in the municipalities within the Região Geográfica Intermediária de Barreiras (as the region is named by the Instituto Brasileiro de Geografia e Estatística – IBGE). Clusters of municipalities with low GI values, on the other hand, are found in Região Geográfica Intermediária de Guanambi and Região Geográfica Intermediária Vitória da Conquista. The analysis shows a correlation between land-ownership concentration and the socioeconomic condition of the regions.

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INTRODUCTION

In Brazil, and many other countries, colonization and agrarian history have greatly influenced the distribution of agricultural land, defining its current configuration. Furtado (2005) describes Brazil's economy formation as a historical process involving the dissemination of technical progress and the capitalism's stimuli to increase its internal capacity. The author states that such process takes place framed by the difficulty of transitioning from a colonial economy to a national economy. He highlights that the Brazil of the current days has never broken with its colonial past, subjecting itself to a relationship entailing dependence on the colonizer and, later, dependence on the financial markets and the industries of the wealthiest countries (MIELITZ NETO; MELO; MAIA, 2010).

Historically, the ownership of land in Brazil has followed a pattern of high concentration, thus the origin of latifundium exploitation in Brazil is based on the capitalist mode of production (PRADO JÚNIOR, 1979; FURTADO, 2005).

Within the huge dimensions of Brazilian territory, the Northeast region presents historical particularities that have not favored its development in the same rhythm experienced in other regions, such as the South (SEI, 2003). According to Goodman (1976), most of the problems faced by farmers in the Northeast arise from the social formation, which promoted an articulation between pre-capitalist and capitalist modes of production. It is noteworthy that unbalanced income between regions is more accentuated in the Northeast, where the median income was lower than other Brazilian regions, from 1992 to 2008. Moreover, despite being a region marked by a large number of small rural enterprises, the Northeast has the smallest average area of agricultural enterprises (HOFFMAN; NEY, 2010).

Like the overall Northeast region, the state of Bahia presents a large concentration of land in the hands of a few landowners, as opposed to the majority of the population living on small properties. According to Santos et al. (2014), the state of Bahia has a similar configuration to Brazil in terms of land structure, characterized as an "inheritance" of colonization, when the territory was divided among donees. Within this conception of land organization in Bahia, the area occupied by smallholdings is insufficient to guarantee the livelihood of most families on these lands (COUTO FILHO, 2000).

Based on these elements, this study analyzed the land structure in Bahia, with a focus on the socioeconomic factors that influence its configuration. The study applied the Gini Index for the land and the spatial clustering technique for the 417 municipalities of Bahia, on data of the last two agricultural censuses of 2006 and 2017.

This study contributes to the analysis of the reality of the rural environment in Bahia, regarding land-ownership. Acknowledgment of the particularities of each region of the state, combined with the understanding of the historical exploitation of each reality can enable better policies to foster rural development.

METHODOLOGICAL PROCEDURES

Study area

The scope of the study was the state of Bahia, Brazil, with 417 municipalities distributed in an area of 564.732,450 km². Of that area, almost 53% represent rural lands, with 762.620 agricultural establishments, according to Agricultural Census 2017 of the *Instituto Brasileiro de Geografia e Estatística* (IBGE). According to data from the IBGE (2018), the state has about 15,344,447 inhabitants, of which 3,914,430, approximately 28%, live in rural areas.

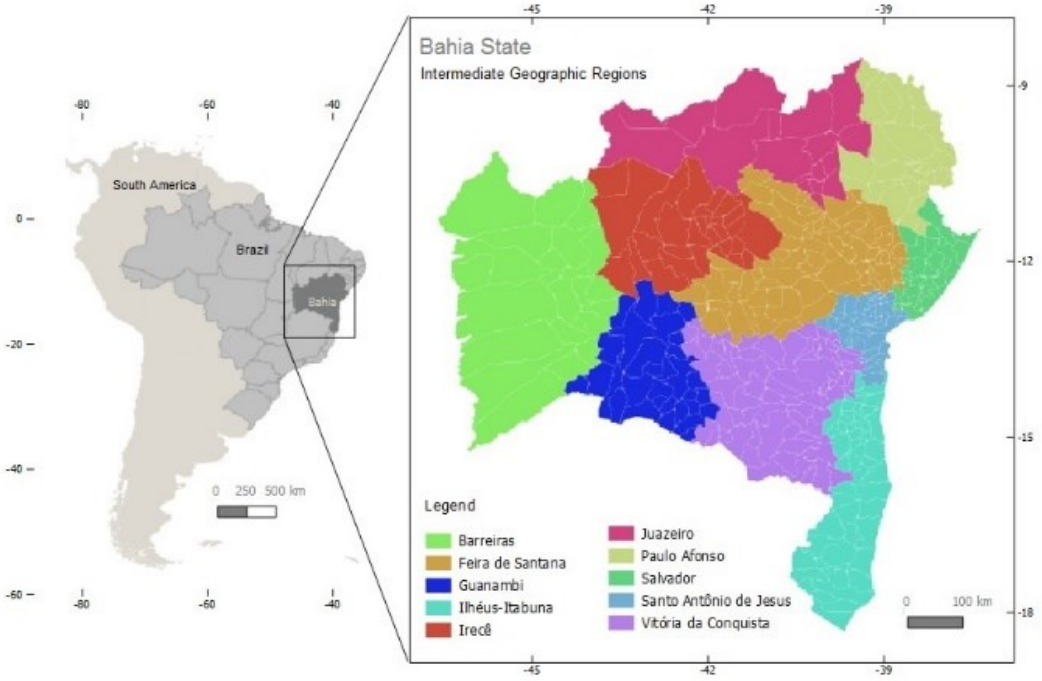
In 2017, the IBGE adopted a new regional subdivision for Brazil, updating the regional Mesoregions and Microregions distribution to introduce a subdivision into Intermediate Geographic Regions (RGIs) and Immediate Geographic Regions, respectively, to reflect the increasing internal differentiation of the Brazilian territory.

> The regional subdivision into Immediate and Intermediate Geographic Areas 2017 incorporates the changes occurred in Brazil over the last three decades [...] This approach turns regions into a construction of geographic knowledge, delineated by the dynamics of the transformation processes that have occurred recently and operated from concrete elements (urban network, hierarchical classification of urban centers, and detection of management flows, among others), capable to identify regional spaces at proper scales (IBGE 2017, pp. 35-36).

Figure 1 shows the geographic location of the

state of Bahia and its RGIs, the subdivision adopted in this study.

Figure 1 - Delimitation of the Intermediate Geographic Regions of Bahia, Brazil, 2017.



Source: the authors, 2018.

Measurability and analysis of the Gini Index

The Gini Index is used to measure the degree of concentration of statistical distributions and is commonly applied to income and land ownership (HOFFMANN; NEY, 2010). In this study, the index was used to measure the degree of land concentration, calculated as the relationship between the accumulated proportion of land and the proportion of individual farms, making it possible to analyze the distribution of land use in Bahia. The Gini coefficient ranges from zero to one; the closer to zero, the lower the land concentration, while the closer to one, the higher the land concentration.

For this study, the index is measured by the following formula (1) (HOFFMANN, 1998):

$$G = 1 - \sum_{i=1}^{n} (Y_i + Y_{i-1})(X_i - X_{i-1}) \qquad (1)$$

where: G = Gini index; Y_i= cumulative proportion of rural areas by area strata; X_i= cumulative proportion of the number of agricultural establishments by area strata.

The GI was calculated using 17 property strata divided into groups of area, ranging from more than 0 to more than 2,500 hectares. The category "producer without land", created in the Agricultural Census 2006, as reported by Hoffmann and Ney (2010), was excluded in all the cases. The 17 area strata are divided into the following groups: from more than 0 to less than 0.1 ha; from 0.1 to less than 0.2 ha; from 0.2 to less than 0.5 ha; from 0.5 to less than 1 ha; from 1 to less than 2 ha; from 2 to less than 3 ha; 3 to less than 4 ha; 4 to less than 5 ha; 5 to less than 10 ha; 10 to less than 20 ha; 20 to less than 50 ha; 50 to less than 100 ha; 100 to less than 200 ha; 200 to less than 500 ha; 500 to less than 1000 ha; 1000 to less than 2500 ha and 2500 ha and over.

The analysis followed the classification proposed by Câmara (1949), which measures land-ownership concentration according to the GI (Table 1), and considers any value above 0.500 as inadequate from a distributive point of view (CAMARA, 1949).

Table 1 - Classification of the Gini Index for land-ownership concentration.

Gini Index	Classification
0,000 to 0,100	Null concentration
0,101 to 0,250	Zero to weak concentration
0,251 to 0,500	Weak to medium concentration
0,501 to 0,700	Medium to strong concentration
0,701 to 0,900	Strong to very strong concentration
0,901 to 1,000	Very strong to concentration the absolute

Source: Câmara (1949, p.517).

The results of the GI calculation can be associated, at a spatial level, for certain areas; this allows identifying similar behaviors and configuring a system of groups, called *clusters*.

According to Perobelli et al. (2007), the Exploratory Spatial Data Analysis (ESDA) is based on the spatial aspects of the database, dealing directly with issues such as spatial dependence and heterogeneity. In other words, this method describes the spatial distribution and the patterns of spatial association, as well as verifying the different spatial regimes or other forms of spatial instability, in addition to identifying atypical observations.

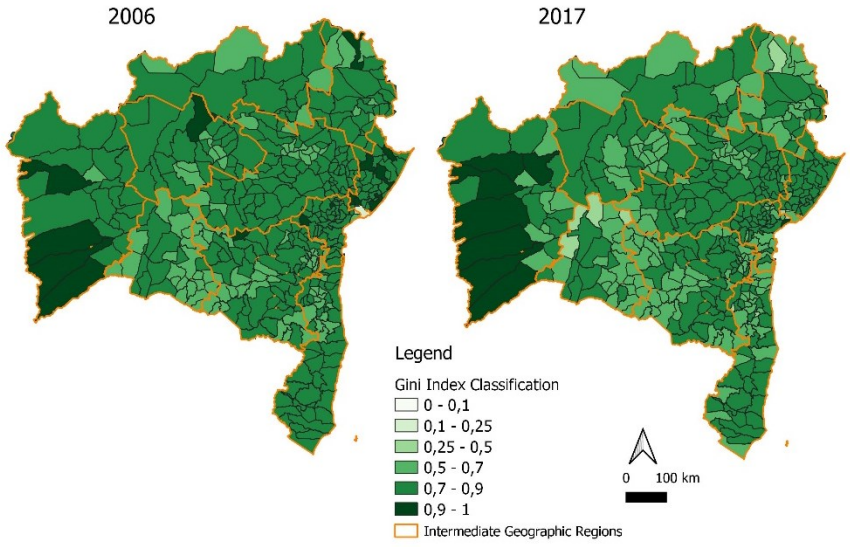
This statistical technique contributes to the analysis of Bahia's land-ownership structure, by identifying configuration similarities regarding concentration in land's possession. Moran's index (Moran's I) measures the spatial dependence between areas, by calculating the spatial autocorrelation as a covariance of the product of the deviations from the mean, relating the value attributed to a given phenomenon in a given place to the average value of its neighbors (PEROBELLI et al., 2007). Thus, in this case, the analysis through Moran's I considers clusters formation between municipalities of Bahia that present common characteristics regarding the level of inequality of land ownership.

RESULTS AND DISCUSSION

Land concentration in Bahia: evidence of spatial clustering

The land concentration classification proposed by Câmara (1949), allow depicting the spatial distribution of land by municipality (Figure 2). Th e darker the green color, the higher the value of the GI and, consequently, the higher the land concentration.

Figure 2 - Gini Index for the land, for the municipalities of Bahia, in 2006 and 2017, by intermediate geographic regions.



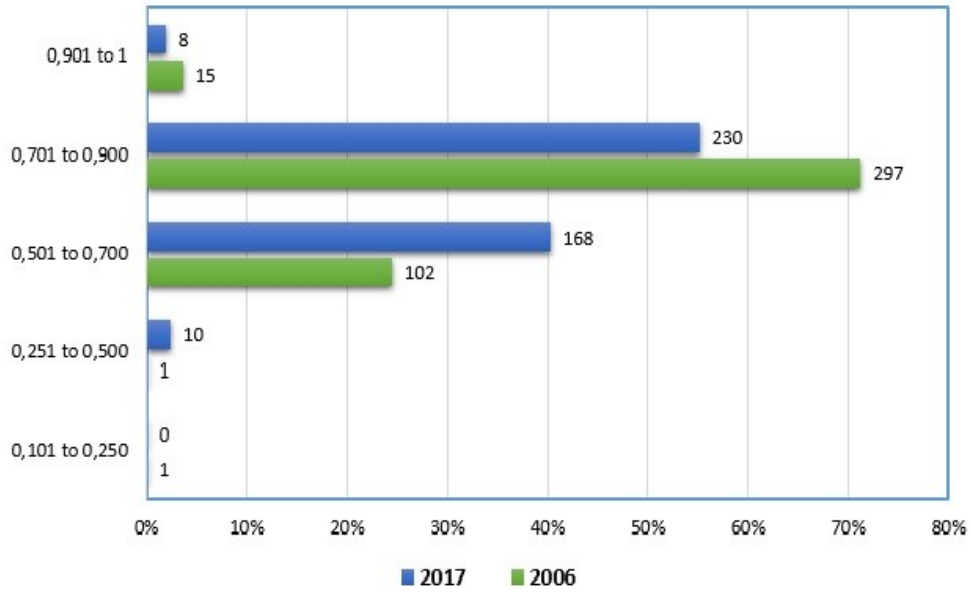
Source: the authors, 2018.

Note: The municipality of Madre de Deus scored zero for the GI, due to the lack of data on this municipality in the IBGE Agricultural Censuses 2006 and 2017.

In terms of spatial location, it is noted that most municipalities in Bahia have a GI greater than 0,500 (414 municipalities in 2006 and 406 in 2017). The classification, identified as strong to very strong (0,700 to 0,900), concentrates the largest number of municipalities in the studied years (71% in 2006 and 55% in 2017), even presenting a 16% drop between both censuses. However, there is an increase in the number of municipalities in the class 0,500 to 0,700, from 24% in 2006 to more than 40% in 2017. It is also observed the presence of some municipalities with a very strong to absolute concentration (GI from 0,900 to 1), varying from 15 municipalities in 2006 to 8 in 2017.

There is a slight decrease in land concentration in the state; from 0,752 in 2006 to 0,713 in 2017 (Figure 3). In 2006, 46,5% of the municipalities were below the average, while 53,5% were above in 2017.

Figure 3 - Quantity and percentage of Bahia municipalities, by type of land classification, according to the Gini Index for land in 2006 and 2017.



Source: the authors, 2018.

Figures 1 and 2 indicate that the concentration of land in Bahia dropped 22,5% between the two studied periods for the strong to very strong concentration class, and almost 47% for the very strong to absolute class. Despite these reductions, just a few municipalities scored within the first three classes, those representing the best distribution of land among agriculture establishments.

In 2006, most of the municipalities with a GI of 0,900 to 1 were in the IGRs of Salvador and Barreiras, and that concentration strengthened for the IGR Barreiras in 2017. Meanwhile, in the same year, almost half of the municipalities in the RGI of Guanambi had a GI of 0,251 to 0,500, considered as a weak to average concentration. Table 2 shows the ranking of the 10 municipalities with the lowest and the highest GI values for 2006 and 2017, and the Intermediate Geographic Regions they belong to.

The RGI of Salvador includes the municipalities with the lowest and highest GI for 2006, namely Salvador (0,213) and São Francisco do Conde (0,982) respectively. In 2017, the municipality of Itaparica, in the RGI of Santo Antônio de Jesus, scored the lowest GI value (0,308), while Correntina, in the RGI of Barreiras, scored the highest GI (0,945).

The RGI of Salvador is the main economic region of the state and has the highest population density. The city of Salvador, capital of Bahia, absorbs proportionally most of the wealth produced in the state. It also polarizes the surrounding municipalities, which make the metropolitan region, especially concerning the manufacturing sector, as it stands out in the production of industrial inputs, namely chemicals and petrochemicals (CARVALHO; CARVALHO; GÓES, 2011).

Table 2. Ranking of the 10 highest and lowest GI values, for 2006 and 2017, by Intermediate Geographic Region (IGR) in which they are located.

2006					
10 lowest GI value			10 highest GI value		
Municipalities	**GI**	**IGR**	**Municipalities**	**GI**	**IGR**
Salvador	0,213	Salvador	São Francisco do Conde	0,982	Salvador
Itaparica	0,489	Santo Antônio de Jesus	Sapeaçu	0,970	Santo Antônio de Jesus
Serra do Ramalho	0,511	Guanambi	Itaguaçu da Bahia	0,935	Irecê
Ponto Novo	0,514	Juazeiro	Correntina	0,932	Barreiras
Ibicaraí	0,533	Ilhéus-Itabuna	Entre Rios	0,929	Salvador
Chorrochó	0,537	Paulo Afonso	Jaborandi	0,919	Barreiras
Barro Preto	0,545	Ilhéus-Itabuna	Rio Real	0,918	Salvador
Ibipitanga	0,547	Guanambi	Cocos	0,917	Barreiras
Vera Cruz	0,556	Santo Antônio de Jesus	Ibicoara	0,917	Vitória da Conquista
Tanque Novo	0,557	Guanambi	Inhambupe	0,916	Salvador
2017					
Itaparica	0,308	Santo Antônio de Jesus	Correntina	0,945	Barreiras
Serra do Ramalho	0,343	Guanambi	Barreiras	0,931	Barreiras
Saubara	0,369	Salvador	Cocos	0,923	Barreiras
Sítio do Mato	0,389	Guanambi	Vera Cruz	0,922	Santo Antônio de Jesus
Firmino Alves	0,455	Ilhéus-Itabuna	São Desidério	0,917	Barreiras
Macururé	0,457	Guanambi	Jaborandi	0,915	Barreiras
Lauro de Freitas	0,464	Salvador	Riachão das Neves	0,913	Barreiras
Paratinga	0,473	Paulo Afonso	Cotegipe	0,906	Barreiras
Ibipitanga	0,495	Guanambi	São Francisco do Conde	0,884	Salvador
São José da Vitória	0,495	Ilhéus-Itabuna	Brejões	0,877	Santo Antônio de Jesus

Source: the authors, 2018.

The unique characteristics of the RGI of Salvador explain its low values of GI for land, as it concentrates the main industrial and service activities of the state of Bahia. Thus, this region brings together a larger population, which attracts better and larger investments.

Indeed, the historical link of Bahia's economy to the commercial activities related to the export of certain goods (sugarcane, tobacco, etc.) has made the most dynamic regions to be located near the coast (200km. wide strip), remaining the city of Salvador as the main trading center of an "outward-looking economy" (IVO, 1983, p. 37, emphasis added).

About the municipality of São Francisco do Conde, also located in the RGI of Salvador, the

highest value of the GI for land in 2006, which remained high in 2017, shows an economy based on agricultural activities (mainly sugarcane), livestock, forestry, but also on the processing industry (IBGE, 2018). Furthermore, since the 1950s, the municipality has undergone a new territorial organization, resulting from the addition of the oil exploitation by the Landulpho Alves Refinery (RLAM), which has influenced the economy, job generation, and social dynamics (MARTINS JÚNIOR; BARBOSA, 2017).

Carvalho (2008) also points out that the municipalities of São Francisco do Conde and Vera Cruz (located in the RGI of Santo Antônio de Jesus), have the most extreme levels of wealth concentration and, consequently, a greater number of poor compared to the other municipalities in the RGI of Salvador, which helps to understand the high GI values observed in these municipalities. The IBGE (2018), on the other hand, points out that in a total area of 10,991ha, four agricultural establishments have areas greater than 1,000ha in São Francisco do Conde, and that 62,5% of the total area of Vera Cruz belongs to only three establishments.

In the RGI of Barreiras, the number of municipalities with very strong land concentration indices (GI between 0,901 and 1,000) grew between 2006 and 2017. In 2006, of the 24 municipalities in this RGI, four presented a very strong concentration; while in 2017 seven municipalities were in that classification. This condition may be associated with the expansion of the agricultural frontier and the importance of agribusiness in this location, which adopted a modern setting of large properties and production mainly intended to the foreign market (BARBOSA, 2016).

The opening of the agricultural frontier in Bahia, which occurred from 1970 to 1980, was one of the events that had a remarkable influence in the changes to the rural area of the state; changes that conditioned, to some extent, the forms of accessing and using the land. Ivo (1983) states that the largest incorporation of rural areas "Beyond São Francisco", in the state, occurred in the west direction, especially in the municipality of Barreiras, considered the most important regional center of Western Bahia (IVO, 1983). The author also points out that this process can be attributed to the Cerrado biome, with flat relief, abundant land at low prices, and great water availability. Santos (2016, p. 10) points out that these factors

> [...] contributed to the implementation of modern agriculture, capable of meeting the demands at national and international level, with the southerners as the main subjects, who already had some technical knowledge acquired in their regions of origin.

The RGI de Barreiras is part of the MATOPIBA region (the acronym that designates a geographic extension formed by the states of Maranhão, Tocantins, Piauí, and Bahia), located north of the Brazilian Cerrado. The agriculture in MATOPIBA encompasses predominantly grain culture; in fact, the western region of Bahia has the largest production of soybean (SEI, 2017), the most exported product. The *Rede Social de Justiça e Direitos Humanos* (RSJDH) and the ActionAid (2017) state that the high concentration of land in this region is due, among other factors, to the growth observed in the prices of land.

In addition, Freitas, Rossini and Queirós (2014), point out that the acquisition of land for agricultural purposes by foreigners in the MATOPIBA region also contributes to the high land-ownership concentration. According to the authors, companies from the Netherlands, USA, and UK are involved in land trading and the production of grains in the Bahia portion of MATOPIBA region. This is a risk to small producers who cannot compete against large agribusiness players and frequently are deprived of access to land by price speculation, resulting in land-ownership concentration.

Moreover, the data reveal that most of Bahia's municipalities score in the strong to very strong class in both years (Figure 2). However, there was a slight decrease in the number of municipalities in this classification, going from 297, in 2006, to 230 in 2017, with an increase of almost 40% of municipalities inserted in the previous classification (medium to strong). Thus, Bahia shows a reduction in land concentration, from a spatial perspective and, in this regard, the municipalities of the Guanambi RGI stand out, as they make up the ranking of the 10 lowest values of GI in 2017 (Table 2). Most of these municipalities are located in the semiarid region of Bahia (central region of the state that includes, besides the RGI of Guanambi, the RGIs of Vitória da Conquista, Feira de Santana, Irecê Juazeiro, and Paulo Afonso).

According to the *Instituto Nacional do Semiárido* - INSA (2017), the area of the

semiarid is 445,613 km², being almost 79% in the state of Bahia. Of the 417 municipalities in Bahia, 278 were in this space and accounted for half the population of the state, besides including, according to Barbosa (2016), the largest number of family farms in Bahia. In 2017, for example, there were 591,213 family establishments (approximately 78% of the total number of agricultural establishments in Bahia) (IBGE, 2018).

The irraegular rainfall makes the region arid, as Baptista and Campos (2013) stated. Such aridity, combined with a poor dynamism, reveals a weak environment in the water storage system, which has not been able to overcome such a situation to transform the socio-economic condition of the population living in rural areas.

Moreover, governments have focused their efforts on combating drought in the semiarid region through broad-impact projects, such as the inter-basin transfer of São Francisco River, the construction of dams and the implementation of large-scale irrigation programs. However, these programs have primarily helped large and medium-sized farmers, favoring the modern irrigated agriculture, and have excluded most of the population from their benefits (BARBOSA, 2012).

Therefore, although land concentration of this region has slightly decreased in some municipalities, its land-ownership structure is still concentrated. In this scenario, the semiarid region lacks policies that promote rural development, adequate to its particularities, and that aim to fulfill various needs on welfare and quality of life. Such policies would foster regional and national markets, driven by the increased productivity of small farmers (FURTADO, 1959).

According to Oliveira (2013), extensive livestock and subsistence farming activities have been predominant in this region since the mid-19th century, considering it was the easiest activity to enter the Caatinga biome in the semiarid region. Despite its key role in the occupation of the territory, this activity was secondary; it supported the sugar cane production by providing supply, especially meat, to the mills. However, its relevance is still present throughout the Brazilian semiarid region: once almost 40% of the total area occupied by farms have pastures, and the percentage is almost 45% in Bahia State (INSA, 2017).

Historically, the semiarid region has not been considered as a key region, attractive for investment, mainly because of the dry climate conditions, characterized by low rainfall, and for the difficult access conditions affecting transport production, on the other hand, these conditions differ from those of coastal regions, which present better distribuition and rainfall volume, besides easier conditions to transport of the production, including greater populations (OLIVEIRA, 2013).

This process of development "pushed" to the poorly capitalized family farms the aridest lands of Bahia for agricultural activities, such as the Sertão region. Thus, according to Sampaio (2008), these activities occupied small areas, preferably on the banks of rivers or, as stated by Oliveira (2013), in latifundia belonging to the rural aristocracy, and a secondary position in the process of industrialization of Bahia, remaining on the fringes of the recent poles that dynamize the economy of the state.

As for the RGI of Ilhéus-Itabuna, most of its municipalities have a concentration from strong to very strong, both in 2006 and 2017. According to Pedreira (2004), a significant part of the growth of agricultural activities in this region, especially in the Far South in the 1980s, occurred as a result of the occupation of natural bushes and forest areas, "made possible" by the deforestation of local natural vegetation.

> Road transport facilities, the existence of low-value land, state and federal government incentives, and the region's high natural potential, were attracting various economic agents to the region, such as loggers, cattle ranchers, farmers, reforestation companies and, finally, the pulp and paper industry (PEDREIRA, 2004, p. 1008-1009).

These factors, which make up the occupation of this territory, may be associated with the tendency to intensify the concentration of land in the Far South, reported by Oliveira, Oliveira and Araújo (2007). Furthermore, the high level of concentration can be partially explained by the agricultural activities developed in the region. Santos et al. (2014) point out that extensive strips of land are required to accommodate, whether in permanent or temporary tillage, traditional monocultures, such as cocoa, coffee, and sugarcane, with the latter occupying up to 77% of the entire planted area.

Carvalho and Bajay (2006) also stand out the

expansion of forestry, encouraged by the enterprises that the paper and pulp industry brought to the region, attracted by its favorable soil and by its climate conditions. However, this movement in the agricultural configuration of Bahia, the increased forestry, denotes a paradox between the growth of employment in the urban area and its negative effects on small family production units. Some of these effects are materialized in the concentration of land, the substitution of crops traditionally cultivated in the region, reduction of rural population and increase of social conflicts in the countryside, along with the devastation of the Atlantic Forest and the introduction of large forest massifs (OLIVEIRA; OLIVEIRA; ARAÚJO, 2007).

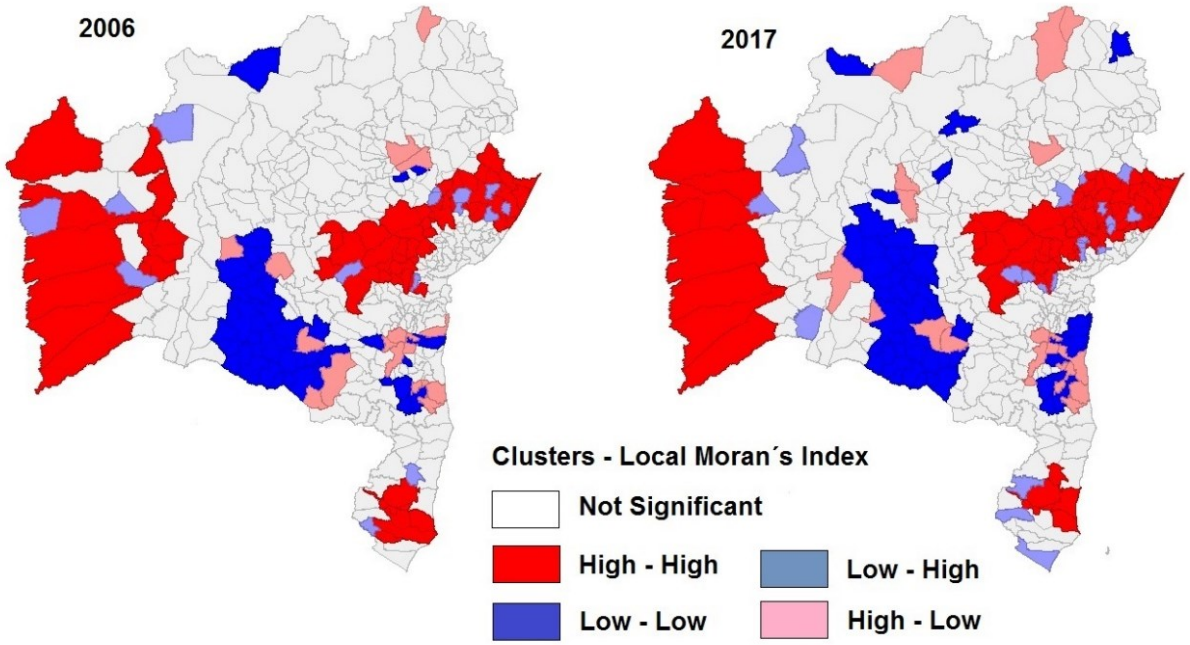
The area north of the RGI of Ilhéus - Itabuna, which covers mainly the territory of identity Litoral Sul (South Coast), has nowadays a land concentration that can be explained by some aspects of its historical formation. Several events in that history shaped a concentrated agrarian setting in the region, one of them the migration of investment-capital, which moved from the Northeast of the country to the cocoa-culture region in the south of Bahia. This movement of the investment capital led to the growth of areas with cocoa culture in Bahia, benefiting the most capitalized producers (ROCHA, 2008).

In the late 1980s, the production of cocoa collapsed due to several factors, such as the spread of the disease known as the witch's broom (*Moniliophtera perniciosa*), along with the drop of cocoa prices worldwide. Despite its economic and social impact, this crisis had little effect on reducing land concentration. Many producers began to sell land, to capitalize, while others resisted doing so, due to the "fixed capital" represented by cocoa. Thus, to capitalize, many producers sought to diversify their production implementing intercrops, such as cacao tree / rubber tree, along with other productive arrangements.

Moreover, to reduce labor costs, producers started to implement partnerships in the areas of cocoa culture. According to art. 96 of the Land Act of 1964, a partnership is an agricultural agreement in which one person undertakes to assign to another, for a fixed or indefinite period, the specific use of a rural estate, or one or more parts of it, and that may or may not include improvements to the property and other assets or facilities, to perform agriculture-related activities (Estatuto da Terra, 1964). The use of the partnership schema in the cocoa production was a way of "socializing" the losses resulting from the crisis that took place in the southern region of Bahia. It allowed landowners to minimize their losses but, as a "counterpart", it brought great poverty to the rural areas. With more compensatory prices, on the other hand, producers do not "socialize" the gains, and the worker and their family are excluded again from the benefit of such capital surplus (SANTOS et al., 2014).

Making a spatial distribution of the GI with the aid of local Moran's Index, it was possible to identify clusters from the land structure in Bahia, formed by internally homogeneous municipalities with high or low GI values (Figure 4). The most expressive clusters can be noted in the RGI of Barreiras, both in 2006 and 2017, confirming the strength of the agribusiness in this region. A high concentration cluster is also shown, covering the RGIs of Salvador, Feira de Santana, and Santo Antônio de Jesus. The RGI Ilhéus - Itabuna, in turn, presented in 2006 and 2017 a low-low cluster and, further north, a high-low cluster (municipalities in worse condition surrounded by municipalities in a better condition). The RGI also presented, in 2017, a new and larger high-high cluster region to the south of the region.

Figure 4 - Spatial clusters for land concentration in the municipalities of the state of Bahia in 2006 and 2017, according to the Local Moran's technique.



Source: the authors, 2018.

Note: Moran's technique presents the formation of clusters, through spatial associations of high-high (AA) type - stains in red -, for municipalities in the worse condition about this issue; or low-low (BB) - stains in dark blue -, for municipalities in a better condition and surrounded by other municipalities scoring similarly. The remaining two possible situations are highlighted: in light blue, for municipalities in a better relative condition surrounded by municipalities in a worse condition, high-low (AB) and; in light red, for municipalities in worse condition surrounded by those in a relatively better situation, low-high (BA) (SEI, 2014).

A similar configuration is also perceived between the years 2006 and 2017 in the formation of spatial clusters of land concentration in the municipalities of the state of Bahia. However, the region that covers most of the RGIs of Guanambi and Vitória da Conquista, mostly located in the semiarid region of Bahia, scores lower GI values in 2006 and 2017, confirming what is shown in Figure 2.

FINAL CONSIDERATIONS

The state of Bahia has remarkable historical characteristics regarding the evolution of its land-ownership structure, denoting an expressive inequality regarding the possession and use of land for farming. This fact was confirmed by GI for the land in 2006 and 2017, it identified a high land concentration in most of the municipalities in Bahia, despite a small decrease in concentration from strong to very strong from 2006 to 2017.

The land-ownership concentration in Bahia is quite heterogeneous, from a spatial perspective, presenting the formation of regional clusters of high concentration of land (in the west, extreme south and in parts of the Metropolitan Region of Salvador and Recôncavo) and clusters of lower land concentration, especially in the semiarid region of the state.

the type of crop, the production site and the type of labor employed seem to affect the degree of land concentration, thus explaining the relevance of socio-economic, environmental and, above all, historical factors to explain the process of high land concentration in Bahia. This allows us to reflect on the need to delineate policies that make it possible to "break" this vicious circle of land distribution in the state. Furthermore, the heterogeneity observed in the land structure in Bahia reveals the need for policy measures that consider local specificities, dynamics, and existing infrastructure, to achieve better land distribution.

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