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Spatial Mobility and Urbanization Trends in Santa Catarina: An Analysis Based on Demographic Censuses

Mobilidade espacial da população em Santa Catarina: Uma análise das tendências de urbanização através dos censos demográficos

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ABSTRACT

This study discusses the use of spatial analysis metrics in a Geographic Information Systems (GIS) environment applied to population census data from the Brazilian Institute of Geography and Statistics (IBGE) from the years 2000 and 2010 to understand the complex and multifaceted spatial mobility in Santa Catherine. For this, quantitative data collected in the different administrative regions of the state of SC were used. The phenomenon, observed in several countries, involves population density in metropolitan regions, motivated by the search for better living conditions and catalyzed by the rural exodus due to technological advances in agriculture and the employment of temporary labor. This movement, generally originating in smaller municipalities and moving towards larger ones, has significant consequences for the economic, social, and environmental dynamics of the places involved, directly affecting the quality of life of individuals. The municipalities of São Pedro de Alcântara, Ituporanga, Campo Alegre and Bom Retiro, in this 10-year period, showed a considerable rural exodus, with a drop in population of -34.48%, -5.24%, -5.29% and -4.03% respectively, while the increase in the urban population occurred in the regions of Norte Catarinense, Vale do Itajaí and Grande Florianópolis, with emphasis on the following municipalities: Massaranduba, Garopaba, Guabiruba, Tijucas, Florianópolis, Blumenau and Joinville, with 64.31% , 42.88%, 41.65%, 38.97%, 22.01%, 21.84% and 19.97%, respectively. This information is useful for public managers in defining ways to provide resources, infrastructure, and services, given the demand for housing, sanitation, education, health, among others.

KEYWORDS: special mobility: spatial analysis: geoprocessing: demography: urbanization trends: GIS.

RESUMO

Este estudo discute a utilização de métricas de análise espacial em ambiente de Sistemas de Informação Geográficas (SIG) aplicadas a dados do censo populacional do Instituto Brasileiro de Geografia e Estatística (IBGE) dos anos de 2000 e 2010 para entender a complexa e multifacetada mobilidade espacial em Santa Catarina. Para isso, foram usados dados quantitativos coletados nas diferentes regiões administrativas do estado de SC. O fenômeno, observado em vários países, envolve o adensamento populacional em regiões metropolitanas, motivado pela busca por melhores condições de vida e catalisado pelo êxodo rural devido ao avanço tecnológico na agricultura e ao emprego de mão de obra temporária. Tal movimento, geralmente originado em municípios menores em direção a maiores, tem consequências significativas para a dinâmica econômica, social e ambiental dos locais envolvidos, afetando diretamente a qualidade de vida dos indivíduos. Os municípios de São Pedro de Alcântara, Ituporanga, Campo Alegre e Bom Retiro, neste período de 10 anos, apresentaram êxodo rural considerável, com uma queda da população de -34,48%, -5,24%, -5,29% e -4,03% respetivamente, enquanto o aumento da população urbana ocorreu nas regiões do Norte Catarinense, Vale do Itajaí e Grande Florianópolis, com destaque nos seguintes municípios: Massaranduba, Garopaba, Guabiruba, Tijucas, Florianópolis, Blumenau e Joinville, com 64,31%, 42,88%, 41,65%, 38,97%, 22,01%, 21,84% e 19,97%, respetivamente. Estas informações são de utilidade para gestores públicos na definição de meios para viabilizar recursos, infraestrutura e serviços, dada a demanda de moradia, saneamento, educação, saúde entre outros.

PALAVRAS-CHAVE: mobilidade especial: análise espacial: geoprocessamento: demografia: tendências de urbanização: SIG.

INTRODUCTION

From the beginning, human beings tend to live in society. With sedentarization, the formation of housing clusters began, which evolved into a more complex society, resulting in urban centers. These areas have been able to attract individuals from the most distant and isolated rural areas, where livestock, agriculture, and extractivism were developed. Commerce, handicrafts, and commercial workshops, as well as the search for socialization, were concentrated in urban agglomeration areas, representing an attraction for the improvement of life.

New forms of communication, and industrialization, are actively functioning as diffusers; however, they standardize new forms and cultural styles (RIBEIRO 2006). This portrays the standardization of cultural models of inhabitants of urban areas, which mitigates differences between populations moving toward an urbanized region.

The state of Santa Catarina has stood out as one of the most prosperous Brazilian federal units in terms of quality of life. Whether in the countryside or in the city, the evolution of this state has attracted and retained a population that grows with each census, demonstrating extraordinary potential. The Human Development Index (HDI), which considers per capita income, education, and longevity, has improved every year, and its most prosperous cities have advanced in these aspects, increasing their population. However, some municipalities have experienced notable population declines (ATLAS BRASIL 2023).

The analysis of these scenarios is essential for understanding the mesoregions of Santa Catarina, with the objective of identifying migration patterns, their characteristics, causes, consequences, and influences on neighboring areas, forming an effective mapping of the area of influence of each municipality.

MATERIAL AND METHODS

This study was based on data derived from the Brazilian national censuses of 2000 and 2010 conducted by the Brazilian Institute of Geography and Statistics (IBGE) (IBGE 2000, IBGE 2010a). These data provide a technical overview of the demographic transformations that occurred during the decade, with the current census data not yet available for common use.

The data used were acquired from Table 202 of the IBGE, which aggregates demographic information fundamental to understanding the population dynamics of Santa Catarina during the study period. For each municipality, population trends related to variations in the number of inhabitants were investigated. The data for Santa Catarina, considering the total population and the total population by household situation, comprise the values shown in Table 1.

Table 1. Total population (A) and household situations (B) in the state of Santa Catarina from 2000 to 2010. The values in parentheses for B represent the percentage of the total populations (A).

(A)

Population	2000	%	2010	%
Grand total	5356360	100	6248436	100
Male	2669311	49.83	3100360	49.62
Female	2687049	50.16	3148076	50.38

(B)

Population	2000	%	2010	%
Total rural	1138429	100 (21.25)	1000523	100 (16.02)
Male	593095	52.10 (11.07)	521839	52.16 (8.35)
Female	545334	47.90 (10.18)	478684	47.84 (7.67)

Source: IBGE Census (Table 202).

For spatial analysis using the ArcGIS application, the Santa Catarina municipal boundaries database (Municipal Mesh 2010), made available by the IBGE in *shapefiles* format (IBGE 2010b), was applied. Using the *"join data" tools,* we linked the numerical population data in the Attributes Table to the perimeters of the respective municipalities using the standard code. In 2000–2010, the municipalities of Pescaria Brava and

Balneário Rincão, formerly belonging to the municipalities of Laguna and Içara, respectively (SANTA CATARINA 2003a and 2003b), were emancipated.

However, it was necessary to normalize the data because negative values could influence subsequent analyses, that is, municipalities that experienced population reduction in 2010 compared to 2000. It is worth noting that this normalization did not alter the results because the study was based on population difference values. Thus, adding equal intervals to the data of interest does not change this variation.

The differences between the total, total urban, and total rural populations were obtained through simple operations performed using the Field Calculator Tool *available in the* Attributes Table of the vector file. To characterize them, the symbology of quantities was applied to the differences found, using the *Natural Breaks Methodology (Jenks) with four different intervals (Figure 1)*. For better visualization and interpretation of the results, it was necessary to apply intervals proportional to the differences for each case, with greater emphasis on those in the North Catarinense region, Vale do Itajaí and Greater Florianópolis.

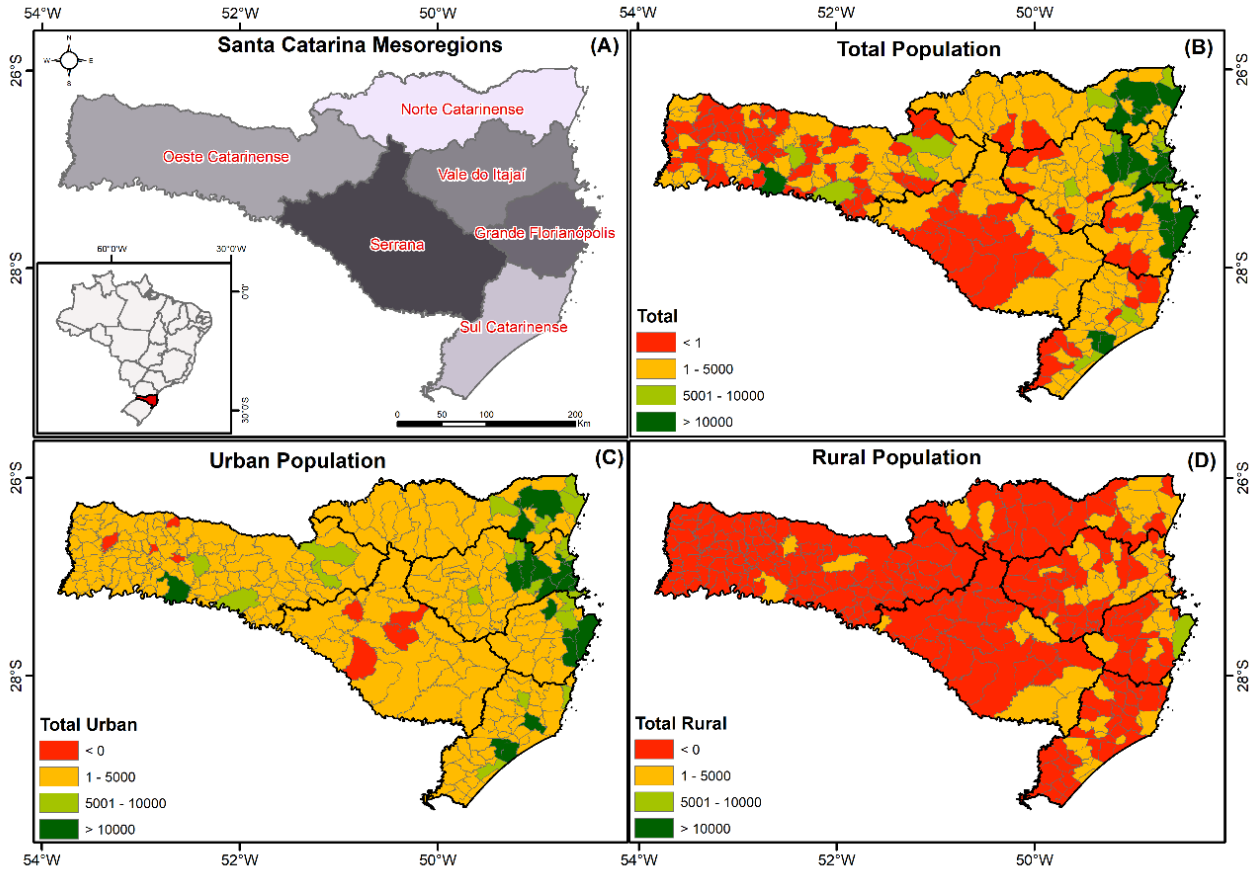

Figure 1. Santa Catarina (A) and absolute population differences for total population (B), urban population (C), and rural population (D).

In addition, to distinguish possible population changes that occurred in the state of Santa Catarina between 2000 and 2010, an assessment was carried out in the different mesoregions. According to the IBGE (2018), physical, economic-social and human characteristics, social processes, natural framework and communication network constitute the delimitation of these regions, expressing a regional identity specific to each area.

Close clusters of data can be identified through cluster analysis and outliers, revealing patterns that reveal important aspects of the variables under study. By applying the LISA (Local Spatial Association Indicators) analysis, according to ANSELIN (1995), in the study of population differences in the state of Santa Catarina from 2000 to 2010, significant spatial clusters were identified (Figure 2). The analysis was performed using the cluster mapping tool: Cluster and outlier analysis (Anselin Local Morans I). The applications of the LISA technique have also been reported in several studies in the agro-veterinary sector (LU & CHENG 2019, Li et al. 2021 and ZHANG et al. 2023).

Then, the size and dynamics of the population were analyzed from 2000 to 2010, using the LISA

technique, in relation to the Municipal Human Development Index (HDI) in the same period. The HDI, according to the United Nations Development Program (UNDP 2023), is a measure composed of indicators of three dimensions of human development: longevity, education, and income. This index is widely used as a measure of social progress, playing an important role in providing an overview of such progress and helping to compare regions. The index ranges from 0 to 1, and a value closer to 1 indicates greater human development.

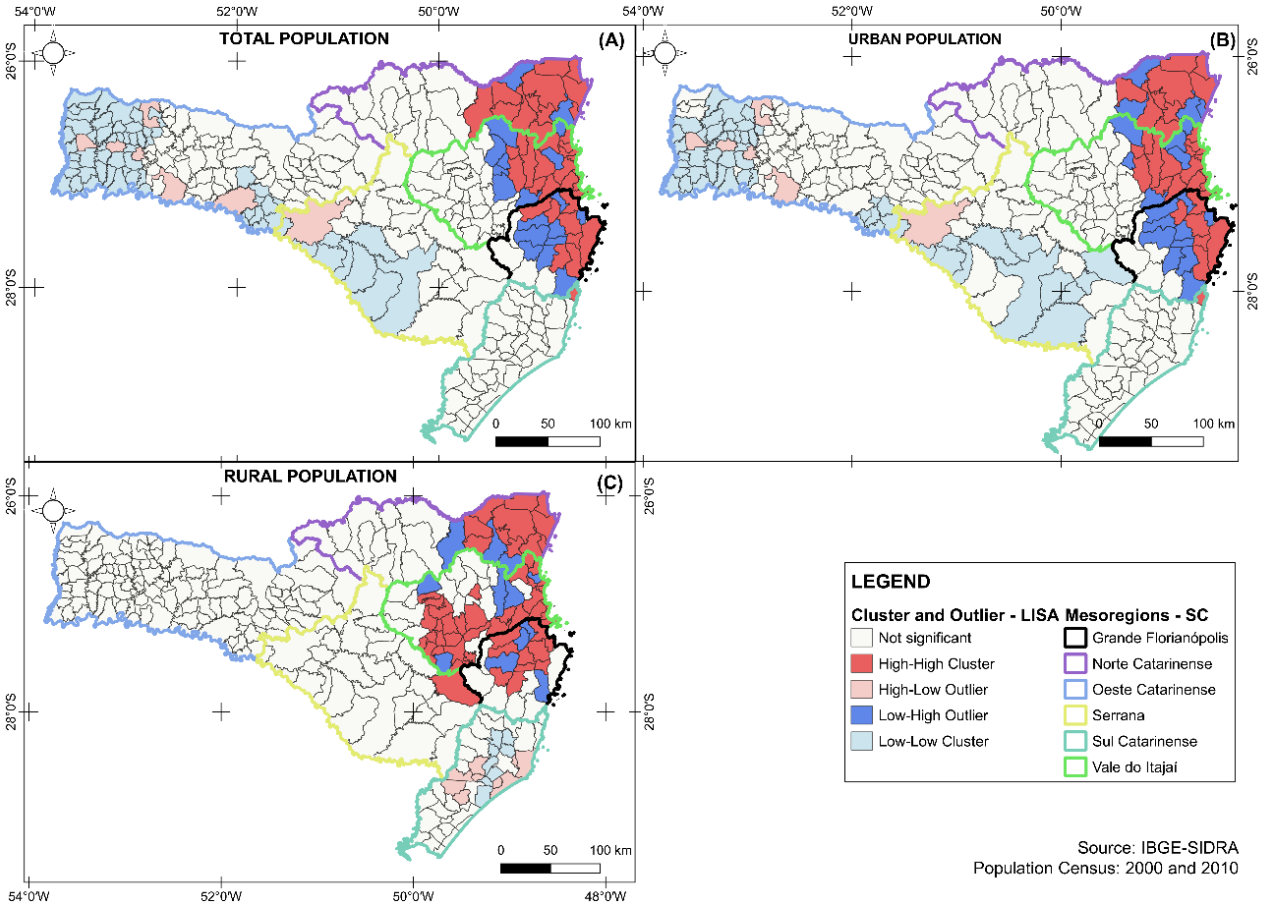

Figure 2. LISA analysis of the mesoregions of Santa Catarina, highlighting in detail the Total Population (A), total urban population (B), and total rural population (C).

Figure 3 highlights some municipalities classified as High-Alto clusters, i.e., statistically significant areas or clusters. These areas have high incidence counts and are surrounded by other regions with high incidence counts. It is important to highlight that clustering differs from absolute differences because clustering analysis allows for a more in-depth assessment, considering the interrelations among the different municipalities and their characteristics. The incidence count considers the total number of residents in the municipalities, including the rural and urban populations.

The Alto-Alto population group was identified in the municipalities of Araquari, Balneário Barra do Sul, Campo Alegre, Corupá, Garuva, Guaramirim, Itapoá, Jaraguá do Sul, Joinville, Massaranduba, São Bento do Sul, São Francisco do Sul, and Schroeder. This cluster indicates a high population density in these regions compared with other municipalities in Santa Catarina.

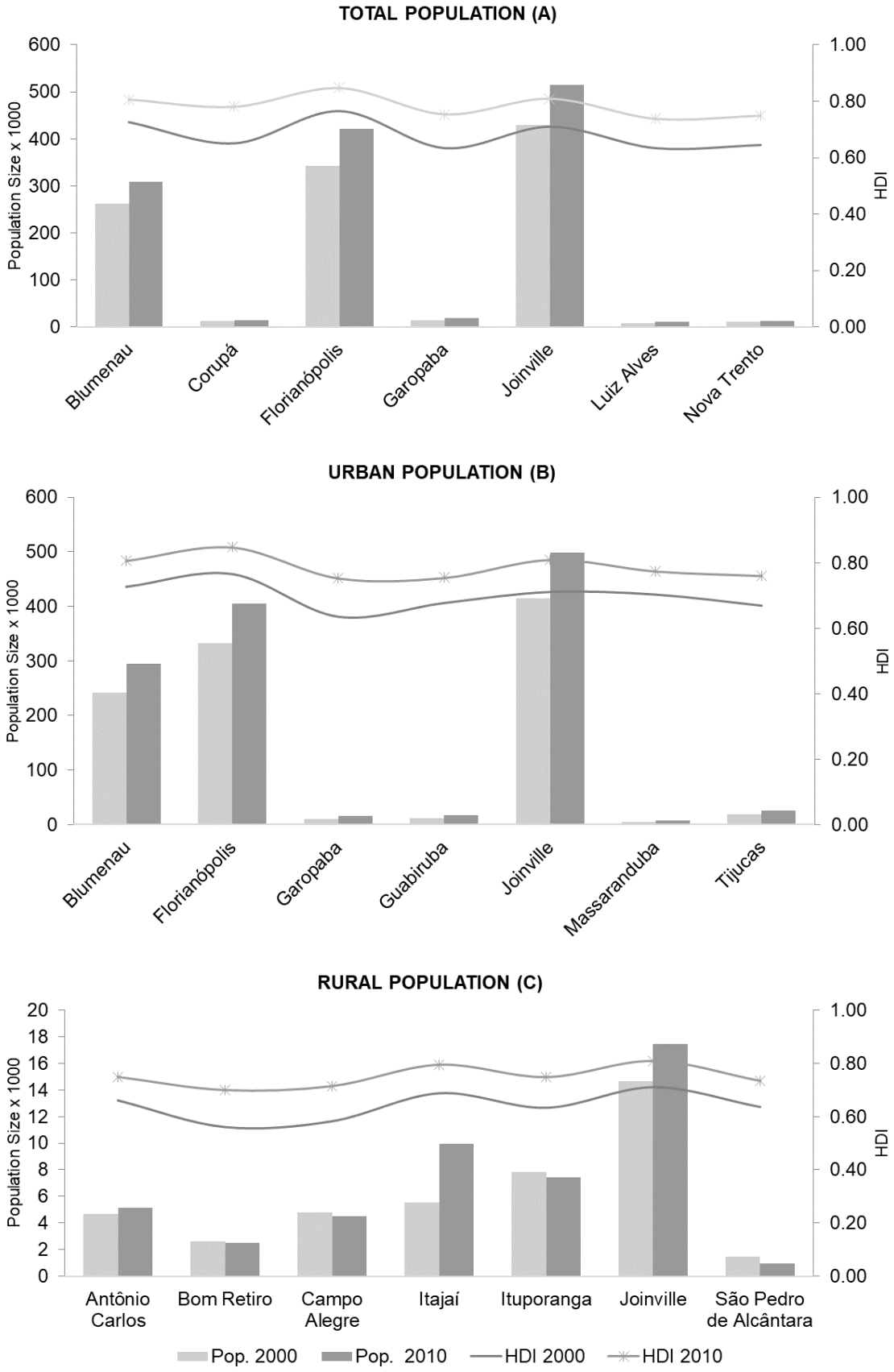

Figure 3. Population growth vs. HDI in selected coastal municipalities with details for Total Population (A), Urban (B), and rural (C).

RESULTS AND DISCUSSION

The results suggest that these municipalities have high values for the measures analyzed (in this case, population) and are surrounded by municipalities with equally high values. This population concentration may

indicate the existence of regional attractions, such as employment opportunities, health services, and quality education, among others, that attract and keep people in these areas.

The economy of the northern region of Santa Catarina is characterized by the interaction of traditional productive sectors, such as industry, with emerging sectors, such as commerce and services. In particular, agro-industries, wholesalers, and electrical and chemical industries play an important role in generating formal employment (GARCEZ et al. 2019). According to MATTEI et al. (2021), trade has been a significant vector of employment, promoting the inclusion of a greater number of women in the labor force. This sector is characterized by many small and medium-sized companies, which may explain the high concentration of formal jobs in the lower wage range.

As shown in Figure 2, the LISA analysis revealed a significantly higher population concentration in the municipalities of Joinville and Jaraguá do Sul compared with the other municipalities in the Northern region of Santa Catarina. This phenomenon, linked to the volume of available employment opportunities, establishes these localities as prominent poles in the northern mesoreodon of Santa Catarina. The demographic density of these municipalities confirms their importance as centers of employment and growth, playing a fundamental role in regional socioeconomic dynamics.

In the analysis of urban population data, a significant population concentration was also observed in the municipalities of Joinville and Jaraguá do Sul. This persistence reinforces the relevance of these municipalities as important demographic centers in the urban structure of the northern region of Santa Catarina.

On the other hand, when considering the data sample referring to the rural population, there was a notable population decrease in the municipalities of Campo Alegre and Araquari. This phenomenon may indicate a migratory tendency of the inhabitants of these localities to the main urban centers, probably motivated by the search for better socioeconomic conditions. This internal migration reflects an important demographic dynamism in the social composition of the northern region of Santa Catarina, which requires additional studies.

The HDI assessment revealed a consistent progression in the municipalities evaluated, suggesting socioeconomic growth in the northern region of Santa Catarina and highlighting a continuous development scenario. Therefore, the classification of these municipalities as an Alto-Alto cluster using the LISA method can be explained by the evolution of the economy of the northern region of Santa Catarina, which has diversified and adapted to continue generating formal employment, even at lower wage levels.

By analyzing data from the Itajaí Valley mesoregion it is possible to highlight historically the strong industrial presence in this region, as well as the advancement of means of transportation, as exemplified by the relevance of the BR 470 and 101 highways, connecting the West and the East, as well as between the South and the North. In addition, it is important to mention the importance of the Itajaí Navegantes Port and Navegantes Airport, which are important for registering large import and export flows (POZO & SANTOS 2020).

Currently, tourist exploration has caused a characteristic urban real estate advance in the region, considerably increasing the total population of the municipalities that stand out in the analyses.

This scenario has caused migrations based on urban development, with areas of attraction specific to each municipality. Migration is characterized by a rural exodus, leaving the countryside for the city, seeking better living conditions based on a well-defined working day with fixed hours and days, working conditions, such as safe and comfortable environments, more attractive salaries, the search for “Enrichment”, a situation favorable to the education and health of children, in addition to technological advances and cutting-edge machinery. In addition to real estate speculation, they end up inducing the mentioned migration. In terms of migration, the urban aspect is also highlighted in the data when there is an outflow from smaller municipalities to larger ones, attracted mainly by industries, the secondary sector and the tertiary sector, in the area of service provision and commerce.

In terms of urban development, we can highlight some municipalities in the region, each group having its own characteristics and specific development. On the one hand, Itapema, Camboriú and Balneário Camboriú have geographical proximity, including borders, which helps with population attraction. The fact that Itapema and Balneário Camboriú are bathed by the Atlantic Ocean and have an extremely effective waterfront for leisure makes real estate development and the entire system, especially in the tertiary sector, drive the growth of the city, a condition that is perceptible when verifying the HDI. In Itapema in 2000, the HDI was 0.705, and in 2010 it was 0.796, Balneário Camboriú in 2000 was 0.777, and in 2010 it rose to 0.845, demonstrating the prospect of, improving the characteristics of these migrations. Camboriú, on the other hand, has an advance based on the territorial stagnation of neighboring Balneário Camboriú, because with real

estate investments and the high cost of living in the tourist city itself, the most financially viable opportunities and incentives end up in Camboriú. The HDI in 2000 was 0.592, and in 2010, it went to 0.726, with a notable increase in per capita income, longevity, education, and investments resulting from neighboring stagnation.

On the other hand, Brusque, Gaspar, Rio do Sul, and Indaial based their growth on the secondary sector, where textile and metalworking industries have proven fundamental to development. Based on this situation, the area of health and education is progressing above normal, which is clear when analyzing HDI data in Rio do Sul in 2000, it was 0.698 and in 2010 it was 0.802; in Indaial, it went from 0.678 in 2000 to 0.777 in 2010. Using mainly the industry, Gaspar went from an HDI of 0.670 in 2000 to 0.765 in 2010; in Brusque, the index was from 0.720 in 2000 to 0.795 in 2010. Thus, areas of population attraction are formed.

An interesting case in relation to cities is Pomerode. In addition to industrial growth, the city sought to increase tourism in the tertiary area through leisure parks or an industry promoted in the food sector, such as breweries and chocolate stores. Therefore, HDI increased from 0.708 in 2000 to 0.780 in 2010.

The HDI of Navegantes was 0.606 in 2010, rising to 0.736 in 2010. Such a significant change is reflected in the transportation system that is based in the municipality, the airport being an important means of carrying out air transport to the state of Santa Catarina, while the port that also reaches the city of Itajaí is a major flow for both imports and exports not only to the state but also to the country. This condition caused the HDI of Itajaí to rise from 0.688 to 0.795 in 2010.

The largest urban center of the region is the city of Blumenau, which is a hub for the textile sector and is currently home to a diversified industrial park including the development of technopoles. Thus, a favorable environment is created for the advancement of per capita income, encouraging areas of education through schooling, through trained institutions, and longevity with reference to health through specialized clinics. As a result, HDI in 2000 rose from 0.727 to 0.806 in 2010.

It is notable to note that some municipalities experienced population evasion from these urban centers, thus causing a population decline, even altering the populations of rural areas. The consequences of such processes in urban centers have been demonstrated through urban macrocephaly, which has been a major challenge for governments and social co-existence. In smaller municipalities, population decline is viewed with concern, as abandonment or a demographic vacuum has caused financial losses in relation to fundraising and raises doubts from a sociological perspective (HENRIQUES & MATTEI 2013, GOULARTI 2015).

According to CAVALCANTI (2009), despite creating many ways of being urban, urbanization has helped to further standardize Brazilians on a cultural level without, however, blurring their differences. Industrialization, as a genre of life that creates its own human landscapes, created industrial islands in its regions. New forms of mass communication are actively functioning as diffusers and standardizers of new cultural forms and styles.

In the presented map that presents the LISA Analysis for the mesoregions of the state of Santa Catarina (Figure 2), it was found that, although the municipalities of Alto-Alto should, in theory, present a strong relationship between HDI and demographic density, this direct relationship was not observed. It was found that a smaller number of the population has a high HDI rate, except the municipalities of Florianópolis and São José, considering both the total population and the urban population.

These indices demonstrate the region's dynamism over decades, shaped by external factors ranging from the rural exodus from the interior of Santa Catarina to the urban centers of the state's coastline, the migration of labor from other states to work in state, state, and federal agencies and companies, implemented since the 1960s, and the migration of those who left the large metropolises in search of a better quality of life in smaller cities (Naspolini, sd). Within a few years, the population of Greater Florianópolis has reached a current rate of 96.86% in urban areas. For the rural population, the same relationship was also observed, except for Biguaçu's municipalities, António Carlos, Tijucas and Águas Mornas, respectively.

Note that the region is considered the regional hub for industry, commerce, and services, where most jobs and the highest population density are located. Outside the town, there are several centralities scattered around the Island and the low-density continental coast, providing residential and tourism-oriented services and connected to the central conurbation by state and federal highways, with their banks occupied, forming a dendritic network structure.

It is also interesting to see that in all cases, even with the decline in population density, HDI increased from 2000 to 2010. This shows that municipalities have grown proportionately over the years. High-Low municipalities also have great potential to change and improve HDI because they have high HDI values (above 0.50). At the same time, the Low-High municipalities are attractive, as they require more investment to attract people who have high incomes, longevity, and education.

In the western region of Santa Catarina, the clustering patterns differ from those in the coastal regions.

The results of the LISA analysis are significant only for the Total and Total Urban population differences; that is, for the rural issue, there was no significance in the municipalities of that mesoreodon (Figure 2). For the absolute difference in total rural area, only three municipalities—Van Nova Itaberaba, Paial, and Capinzal —(Figure 1). However, it should be noted that these values are not significant for the groups.

There are clearly highlighted High-Low discrepancies and Low-Low Clusters in parts of the mesoreodon for both significant variables. The result differs in some municipalities, highlighting the presence of Concórdia as a high-low discrepancy only for the Total population. This characterization is due to the clustering of neighboring municipalities, with a greater number of Low-Low Clusters surrounding them in the Total Population scenario.

Thus, Concórdia is a significant municipality with high values, surrounded by others with lower values for the difference in the total population. This indicates the potential for population growth in Concórdia, highlighting that its growth does not occur precisely in urban areas, given its insignificance for the difference in the Urban Total (NASCIMENTO & SANTOS 2023). This growth factor, which is not limited to urban development, can be explained by the growing livestock production sector. According to the Santa Catarina Swine Breeders Association (ACCS 2023), the municipality of Concórdia had the fifth largest pig herd in Brazil in 2019. Another related point is the presence of the Swine and Poultry Center of the Brazilian Agricultural Research Corporation (EMBRAPA 2023) in the municipality, which has been responsible for boosting the agricultural sector in the region since 1975.

The other notable municipalities (High/Low) for significant observations were the following: Chapecó, Pinhalzinho, Maravilha, São Miguel do Oeste and São Lourenço do Oeste. These municipalities are listed as having the greatest potential for population growth in the urban area of western Santa Catarina. A characteristic feature of these municipalities is their growing HDI, expressing human development. Among these, Pinhalzinho's municipality showed the highest variation in this index, increasing its HDI from 2000 from 0.663 to 0.783 in 2010.

The main federal highways in western Santa Catarina are BR-282, BR-163, and BR-480. These roads play a crucial role in the development of the region, connecting the listed municipalities. It is interesting how easier access to the flow of people, goods, and services allows for greater economic development, a fact that allows progress in the western region of the state. Analyzing Figure 2, the results obtained indicated that the Serrana and South regions did not generally exhibit significant population concentrations.

CONCLUSION

This technical note presents the development of an index system for evaluating aspects of rural population migration to urban centers, based on the analysis of quantitative data collected in the different administrative regions of the state of Santa Catarina.

The proposed analysis provides a robust empirical basis for identifying the evolution of rural emptying in the state of Santa Catarina, considering two dimensions of space-time. The study also explores the driving forces behind this evolution that can be developed once information from the new census is available.

The results of the obtained indices indicate a general trend of negative selection in urban/rural flows, positive in rural/urban flows, and longer migratory steps. It can therefore be inferred that the North and Vale do Itajaí regions had the highest population growth rates and became the main destinations of the population, motivated by factors such as climate, the economic development of cities, employment opportunities, quality of life, proximity to the sea, and public policies.

On the other hand, the mountainous region and the extreme west of the state experienced a high rate of rural exodus, possibly motivated by the lack of economic opportunities, the adverse climate, and the limitations of infrastructure and basic services that directly affected the quality of life and the opportunities available. Thus, there is a need for specific public policies such as those reported by FERRARI et al. (2007).

It is essential to highlight that the rural exodus is intrinsically linked to the objectives of the Organization for Sustainable Development (SDGs), especially objective 11, which aims to make cities and communities inclusive, safe, and sustainable. The massive displacement of rural populations to urban areas directly impacts sustainable development, causing problems such as overpopulation, the lack of adequate infrastructure, and environmental degradation in cities. In addition, it is also related to objective 1, which seeks to eradicate poverty in all forms, as many rural migrants seek better economic opportunities in cities due to the lack of employment and poor conditions in the countryside.

It is essential to promote the reduction of rural exodus and develop strategies to strengthen rural communities as essential elements to achieve the objectives of the SDGs and ensure sustainable and

equitable development.

The analysis has high applicability, offering valuable insights for urban and rural planning, and may influence strategies to minimize rural exodus and promote sustainability. Although our study is comprehensive, we see the potential for expansion: we suggest that future research explore data segregation by gender, as migration may impact men and women differently, allowing for even more targeted strategies for sustainable development.

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REFERENCES

ACCS. 2023. Associação Catarinense de Criadores de Suínos. Concórdia tem o 5º maior efetivo de suínos do Brasil. Available at: https://www.accs.org.br/noticias/5407-concordia-tem-o-5o-maior-efetivo-de-suinos-do-brasil. Accessed on: 05 Jul. 2023.

ANSELIN L. 1995. O Local Indicators of Spatial Association-LISA. Geographical Analysis 27: 93-115.

ATLAS BRASIL. 2003. ATLAS DO DESENVOLVIMENTO HUMANO NO BRASIL. Rio de Janeiro, Programa das Nações Unidas para o Desenvolvimento - PNUD, IPEA, Fundação João Pinheiro. Available at: http://atlasbrasil.org.br/. Accessed on: 04 Jul. 2023.

CAVALCANTI ERS. 2009. "Olhares sobre a cidade segregada." Maceió: UFAL.

EMBRAPA. 2023. Embrapa Suínos e Aves. Available at: https://www.embrapa.br/suinos-e-aves/apresentacao. Accessed on: 05 Jul. 2023.

FERRARI DL et al. 2007. Jovens agricultores do Oeste de Santa Catarina na encruzilhada: entre o rural e o urbano. Agropecuária Catarinense 20: 76-81.

GARCEZ LC et al. 2019. Complexidade econômica e desequilíbrios regionais em Santa Catarina. Textos de Economia 22: 4-31.

GOULARTI JG. 2015. Migrações e urbanização em Santa Catarina. RDSD 1: 85-105.

HENRIQUES FL & MATTEI LF. 2013. O processo migratório em Santa Catarina: evidências a partir da microrregião de Joaçaba. Geosul 28: 65-88.

IBGE. 2010a. Censo Brasileiro de 2010. Rio de Janeiro: IBGE.

IBGE. 2000. Censo Demográfic 2000. Available at: <www.ibge.gov.br>. Accessed on: 07 June. 2023.

IBGE. 2010b. Malha municipal de 2010. Available at: https://www.ibge.gov.br/geociencias/organizacao-do-territorio/malhas-territoriais/15774-malhas.html?edicao=27421. Accessed on: 07 June. 2023.

IBGE. 2018. Divisões Regionais do Brasil. Disponível em: https://www.ibge.gov.br/geociencias/organizacao-do-territorio/divisao-regional/15778-divisoes-regionais-do-brasil.html?=&t=o-que-e. Accessed on: 07 June. 2023.

LI D et al. 2021. Spatial patterns of vegetation coverage change in giant panda habitat based on MODIS time-series observations and local indicators of spatial association. Ecological Indicators 124: 107418.

SANTA CATARINA. 2003a. Lei Ordinária nº 12.690, de 19 de dezembro de 2003. Cria o município de Pescaria Brava e adota outras providências. Available at: https://leisestaduais.com.br/sc/lei-ordinaria-n-12690-2003-santa-catarina-cria-o-municipio-de-pescaria-brava-e-adota-outras-providencias. Accessed on: 26 June. 2023.

SANTA CATARINA. 2003b. Lei Ordinária nº 12.668, de 09 de dezembro de 2003. Cria o Município de Balneário Rincão e adota outras providências. Available at: http://leis.alesc.sc.gov.br/html/2003/12668_2003_Lei.html#:~:text=Art.,elevado%20%C3%A0%20categoria%20de%20cidade. Accessed on: 26 June. 2023.

LU CF & CHENG CY. 2019. Impacts of Spatial Clusters on certified organic farming in Taiwan. Sustainability 11: 2637.

MATTEI L et al. 2021. Evolução e distribuição dos vínculos formais de trabalho nas mesorregiões de Santa Catarina entre 2001 e 2017. Textos de Economia 24: 1-27.

NASCIMENTO E & SANTOS RC. 2023. Migrações internas e dinâmica socioespacial no oeste de Santa Catarina na aurora do século XXI. Revista FOCO 16: e696.

POZO H & SANTOS JFP. 2020. O crescimento do Porto de Itajaí e sua importância para o cenário brasileiro: Um comparativo com o Porto de Santos. South American Development Society Journal 6: 18.

UNPD. 2023. PROGRAMA DAS NAÇÕES UNIDAS PARA O DESENVOLVIMENTO Home Brasil: Desenvolvimento Humano e IDH. Disponível em: https://www.undp.org/pt/brazil/desenvolvimento-humano-e-idh-0. Accessed on: 04 Jul. 2023.

RIBEIRO D. 2006. O povo brasileiro. São Paulo: Companhia de Bolso.

ZHANG R et al. 2023. Impacts of Spatial Clusters on certified organic farming in Taiwan. Agriculture 13: 1172.