

## THE CONSOLIDATION OF POLARIZED URBAN AREAS IN THE BRAZILIAN NORTHEAST SEMI-ARID REGION

*A consolidação de áreas urbanas polarizadas no semiárido do nordeste brasileiro*

*La consolidación de las áreas urbanas polarizadas en el semiárido del nordeste brasileño*

**João Paulo Silva dos SANTOS** – Universidade Federal do Rio Grande do Norte (UFRN); ORCID ID: <https://orcid.org/0000-0003-3723-5463>  
URL: <http://lattes.cnpq.br/1998443990140968>  
EMAIL: [joaozcx@yahoo.com.br](mailto:joaozcx@yahoo.com.br)

**Alexsandra Ferreira GOMES** – Universidade do Estado do Rio Grande do Norte (UERN); ORCID ID: <https://orcid.org/0009-0002-9725-9125>  
URL: <http://lattes.cnpq.br/4712664285169355>  
EMAIL: [alexsandrafq@gmail.com](mailto:alexsandrafq@gmail.com)



### ABSTRACT

This article understands that polarization is a phenomenon that operates in the unequal production of capitalist space. Its objective is to identify, in academic production (between the years 2000 and 2021), factors that can be related to the consolidation of polarized urban areas in the semi-arid region of Northeast Brazil. The methodology used was the execution of an integrative systematic bibliographic review. The textual data were analyzed with the support of the IRAMUTEQ software. The main factors identified were: the capitalist expansion movement; state-owned actions for regional development and attraction of industrial activities; the continued productive specialization of urban areas and the consequent expansion of commerce and services.

**Keywords:** Polarization; Process; Capitalist space; Textual data; Iramuteq.

### RESUMO

Este artigo entende que a polarização é um fenômeno que atua na produção desigual do espaço capitalista. O seu objetivo é identificar, na produção acadêmica (entre os anos 2000 e 2021), fatores que podem ser relacionados com a consolidação de áreas urbanas polarizadas no Semiárido do Nordeste do Brasil. A metodologia utilizada foi a execução de revisão bibliográfica sistemática integrativa. Os dados textuais foram analisados com o apoio do software Iramuteq. Os principais fatores identificados foram: o movimento de expansão capitalista; ações estatais de desenvolvimento regional e de atração de atividades industriais; a contínua especialização produtiva das áreas urbanas e a consequente expansão do comércio e dos serviços.

**Palavras-chave:** Polarização; Processo; Espaço capitalista; Dados textuais; Iramuteq.

<http://periodicos.apps.uern.br/index.php/GEOTemas/index>

## RESUMEN

Este artículo entiende que la polarización es un fenómeno que opera en la producción desigual del espacio capitalista. Su objetivo es identificar, en la producción académica (entre los años 2000 y 2021), factores que puedan estar relacionados con la consolidación de áreas urbanas polarizadas en la región semiárida del Nordeste de Brasil. La metodología utilizada fue la ejecución de una revisión bibliográfica sistemática integradora. Los datos textuales fueron analizados con el apoyo del software Iramuteq. Los principales factores identificados fueron: el movimiento de expansión capitalista; acciones propiedad del estado para el desarrollo regional y la atracción de actividades industriales; la continua especialización productiva de las zonas urbanas y la consiguiente expansión del comercio y los servicios.

**Palabras clave:** Polarización; Proceso; Espacio capitalista; Datos textuales; Iramuteq.

## 1 INTRODUCTION

When we encounter a study proposal that has polarized urban areas as its theme, possibly the first associations that we make to these terms are articulated with the theory of centralities, formulated by Walter Christaller and August Losch, or the ideas of poles of growth, developed by François Perroux and Jacques Boudeville. These memories are usual since the proposals launched by the theorists introduced the understanding of the category of space as an essential factor for the development of the capitalist productive system (Alves, 2016).

Nevertheless, without intending to disagree with the elements outlined in the theories presented<sup>1</sup>, the discussion presented in this article aims to treat urban and regional polarization not only as an active element in the productive dynamics but as a phenomenon that acts in the unequal production of the capitalist space<sup>2</sup>. For this, it is necessary to understand that the polarization process contemplates a hierarchical system that reflects characteristics of domination and irreversibility amidst a system of center-periphery relations (Brandão, 2012). Therefore, it is not only related to the hierarchy between the urban areas<sup>3</sup>.

This view stems from the condition that the process of polarization is the result of the development of capitalist productive forces that are organized in a centralized manner

---

<sup>1</sup> The purpose of the proposal is not to debate these theories but rather to address the term "polarization" as a process. In addition, disagreement with the theories would cause a contradiction since they are the methodological basis on which the official regional studies, cited throughout the text, are developed.

<sup>2</sup> Ideas about this understanding can be seen in the works of Brandão (2012), Harvey (1992; 2013), and Santos (1994). Throughout the work, the theoretical perspectives idealized by these authors will be used to attribute meaning to the empirical reality discussed.

<sup>3</sup> This understanding was used for the development as a part of the doctoral research on the regional/urban position of the municipality of Mossoró/RN. This study, which is still being finalized, is linked to the Postgraduate Program in Urban and Regional Studies at the Federal University of Rio Grande do Norte.

and unequally dispersed throughout space, according to the forces exerted by the levels of fixed capital concentrated in certain territorial areas (Brandão, 2012). As a consequence, the higher the hierarchical level of this polarization, the greater its condition of counterbalancing and anti-reversal of power since, over time, these places become increasingly concentrating productive infrastructure, service specialties, territorial management institutions, consumption, and political and cultural power (Brandão, 2012)<sup>4</sup>.

From this, we understand that thinking about polarization as a process associated with the production of unequal capitalist space (due to the hierarchy between the center/periphery of capitalism) can help in the understanding of how the productive conjunctures<sup>5</sup> of urban areas cause socioeconomic effects on their existing others in their vicinity. To this end, in a more general context, one must consider the performance of the central decision-making forces linked to the nuclei of the highest hierarchical level and their repercussions in the peripheral areas. At a detailed level, must be considered, the scope and characteristics (productive, socioeconomic and natural, political and cultural) of the influences of capital, the interdependencies of economic activities, and their connections with the actions of the agents associated with them.

Through these movements, polarization (as a process)<sup>6</sup> generates particular urban areas<sup>7</sup> where productive and political-administrative characteristics coexist that produce enough gravity to agglutinate the dynamics of urban areas that have low levels of fixed installed capital and power<sup>8</sup>. Examples of this condition are the existence of several urban areas in the semi-arid region of the Northeast<sup>9</sup>, classified as Regional Capitals by IBGE (2020), such as Mossoró (RN), Sobral (CE), and Caruaru (PE), among others.

---

<sup>4</sup> Studies by the Brazilian Institute of Geography and Statistics (IBGE) on Brazil's urban hierarchy demonstrate these characteristics. In the publications Region of Influence of Cities (REGIC) (IBGE, 2008; 2020), the agency characterizes the centrality levels of the country's urban areas, mainly considering the levels of territory management, business management, and the number of trips to access commerce and services.

<sup>5</sup> In this work, the expression "productive conjuncture" refers to how the productive activities of a region are organized over time and space. It involves elements such as the availability of natural resources, financial resources, employment relations, government policies, and economic dynamics at different scales.

<sup>6</sup> Within the theoretical proposal that considers that the production of space is not homogeneous, the understanding of the term polarization, discussed in this article, crosses multiple scales (territory, place, scale, and networks) (Jessop; Brenner; Jones, 2018) and is related to other processes that produce capitalist space, such as homogenization, integration, and hegemony, in Brandão (2012), or the concentration of capital, the acceleration of the rotation time of capitalist activity, and the establishment of structured coherence, in Harvey (2005).

<sup>7</sup> As demonstrated by official studies of the national urban hierarchy (IBGE, 2008; 2020).

<sup>8</sup> Economic and political-administrative.

<sup>9</sup> The Northeast Semi-arid region is an area that encompasses nine states in the Northeast region of Brazil. This territorial scope is delimited by the Superintendence of Development of the Northeast (SUDENE), considering climatic characteristics such as semi-aridity are related to low rainfall rates (IBGE, 2022).

In this scenario<sup>10</sup>, this proposal aimed at carrying out, in an exploratory way, research to identify, in the national academic work carried out between the years 2000 and 2021, factors<sup>11</sup> that can be related to the consolidation<sup>12</sup> of polarized urban areas in the Semi-arid region of Northeastern Brazil.

To achieve the delimited purpose, the methodology used was the execution of an integrative systematic literature review (RBSI). The textual data collected in scientific articles, books, theses, dissertations, course completion work, and publications of scientific events subsidized this methodology. Data analysis was performed using the lexicological analysis process in the *software Interface de R pour les Analyses Multidimensionnelles de Textes et de Questionnaires*<sup>13</sup> (Iramuteq).

The present article is divided into four parts in addition to the introduction. The first part of this article provides a brief theoretical description of the urban and regional polarization process as a determinant in the unequal production of the capitalist space. The second part presents methodological issues about RBSI performance and analyses and interpretations of the results of lexicographic analyses of textual data. The last part presents final considerations on the findings reached with the RBSI.

## 2 POLARIZATION AS A PROCESS ASSOCIATED WITH THE UNEVEN DEVELOPMENT OF CAPITALIST SPACE

In the classical view of the term "polarization", there is already the idea that the development of the productive forces of capitalism in different parts of space does not appear simultaneously. The explanation that Perroux (1977) offers for this is that the advance of development occurs at localized points, or rather, at poles that concentrate growth, causing differentiated impacts on the economic conjuncture in which they relate. The power of the pole arises precisely from the disequilibrium relations between the forces that drive capitalist dynamics in space. In this sense, an urban pole is, above all, a consequence of the process of capitalist development, considering that, as Coraggio (1972)

---

<sup>10</sup> Even considering the polarization process as a central point of the discussion, this article does not seek applied understandings about the causal relations and conditions between urban and regional conjunctures.

<sup>11</sup> The research is expected to identify mainly political, productive, and socioeconomic factors.

<sup>12</sup> In this document, the "consolidation" term refers to the process by which an urban area strengthens its position and hierarchical influence over a given regional area.

<sup>13</sup> *Iramuteq software* is a text analysis tool used to perform multidimensional analysis of textual data. It is used in qualitative studies and content analysis in research associated with sociology, linguistics, psychology, political science, and other disciplines that perform textual analysis. In this study, was used version 0.7 alpha 2.

explains, in each economic system present in a portion of space, there are relations of domination based on asymmetry and irreversibility.

From this condition arise the hierarchies between the poles. Manuel Correia de Andrade (1963) explains this by demonstrating that, between the polarized areas (from the international to the local), there is an organization that provokes forces of attraction, diffusion, and concentration of capitalist flows that are essentially, according to Milton Santos (2003), the surplus of capitalist activity.

This condition promotes heterogeneity among urban areas because, due to characteristics such as spatial positioning, types of economic specialization, functions, and their population and territorial size, they assume different positions in a hierarchical pattern of spaces. Alves (2016) evidences this finding in the view of Christaller and Lösch:

The theory of centrality, in Walter Christaller's version and in August Lösch's, states that cities are essentially centers that provide services to the populations around them. They are spatialized within a hierarchical pattern based on the goods they have to offer (Alves, 2016 p. 06).

In this sense, it is possible to understand that the regions are organized around urban areas that gradually become dominating the regional productive flows due to receiving more contributions of fixed capital, having higher levels of specialization, and being the target of the installation of state agencies that manage the territory and provide diversified public services.

Considering these conditions, the discussion presented in this work believes that the model that Hagget (1973) features is coherent, where material and immaterial flows<sup>14</sup> (Figure 01) are considered the precursors and maintainers of polarization. Initially, the intensification of flows provides a network formation that develops and creates nodes or poles<sup>15</sup>. Considering the heterogeneous character of each node within the network, hierarchies are configured that develop their positions of domination<sup>16</sup> and create areas of influence where they concentrate and disperse flows<sup>17</sup> over time.

---

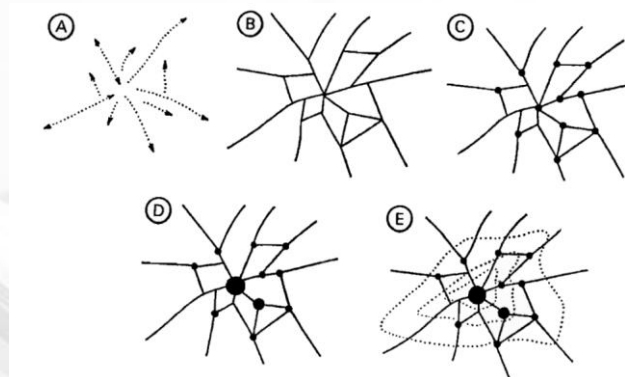
<sup>14</sup> That involves people, goods, capital, and information.

<sup>15</sup> Items A and B of Figure 01.

<sup>16</sup> Item C and D of Figure 01.

<sup>17</sup> Item D of Figure 01.

**Figure 01 – Evolution of Polarization**



**Source:** Hagget (1973).

This idea is interconnected with that developed by Furió (1996, p 79, apud Brandão, 2012, p. 82), where he understands that "flows are not randomly distributed, nor with uniform intensities [...] The most important flows tend to be oriented in the direction and from some dominant centers." In the same sense, Santos (2003) understands that polarization follows the trend of capital concentration since the surplus converges to "where the most effective mechanisms for its multiplication are found" (Santos, 2003, p. 156).

With these examples, it can be seen that recent theoretical contributions to polarization models, developed to highlight the importance of spatial analysis for the development of capitalism, have surpassed the postulates that predicted a "spatial equilibrium" through a process of "marginal adjustment" (Friedmann, 1963). In this regard, Santos (2003) points out that the evidence demonstrates the opposite of "spatial balance". The author states that it does not materialize since "each place [...] there is a particular combination of modes of production, that is, [...] a particular form of dialectic between the productive forces and the relations of production" (Santos 2003, p. 155).

These understandings strongly contributed to the elucidation of the cumulativeness of flows in certain polarized urban areas, the uneven growth, and the blocked transmission<sup>18</sup> of development (Brandão, 2012) at the regional level. Viewing these conditions from a broader point of view, Brandão (2012) understands that polarization is the result of associated conditions that are, basically, the concentration and centralization of capital and its consequences in space. This perspective supports the idea that polarization is, first and foremost, the result of capitalist structural heterogeneity caused by forces that favor the accumulation of flows in certain places of space.

<sup>18</sup> Considering that development does not occur in fullness in areas close to a strong urban and regional polarization.

In this sense, to think of the term "polarization" as a process associated with the unequal production of the capitalist space is to visualize, in a macro way<sup>19</sup>, that the dynamism involved in the concentration of capital, in the acceleration of the rotation time of capitalist activity, and the establishment of a structured coherence<sup>20</sup>, are integrated, in a given space, to produce a polarized area.

This thought can be related to the current conjuncture of the urban network in the Northeast of Brazil because, even with the productive and socioeconomic advances experienced in recent decades in the macro-region, its urban network continues with the same aspect of the twentieth century (Clementino and Pessoa, 2013). Historically, it has been structured by large metropolises and urban centers dispersed and atomized within it. For Clementino and Pessoa (2013), this condition results from historical articulation between the flows established between the coast and its inland area, encompassing the semi-arid region.

Thus, considering polarization as a phenomenon that acts on the unequal production of the capitalist space, it is valid to think for the semi-arid region of the Northeast of Brazil that the more diverse and ample the spaces of action of the influences of polarized urban areas, the greater will be their forces of domination and irreversibility because they will continuously provide the concentration of regional flows<sup>21</sup>.

### 3 METHODOLOGICAL PROCEDURES OF THE RBSI

The RBSI used the methodological proposal developed by Botelho, Cunha, and Macedo (2011). The authors, considering the types of literature review, define that:

An integrative review [...] summarizes the past of the empirical or theoretical literature to provide a more comprehensive understanding of a phenomenon [...]. This research method aims to draw an analysis of the knowledge already built in previous research on a given topic. The integrative review

---

<sup>19</sup> Following the precepts of Harvey (2005), these processes are part of the general condition of capital expansion. They develop within the perspective that considers the surplus of capital and workforce to be the main factors of capitalist development.

<sup>20</sup> Jessop (2006), analyzing the ideas of Harvey (2005), understands that structured coherence is a condition of coexistence between factors that can be found in a given spatial cut. It occurs where coherence crystallizes between the forms and technologies of production, the modes of consumption, the rhythms of demand and labor supply, physical infrastructures, and social relations (Harvey, 2005). According to Jessop (2006, p. 08), it creates a spatial condition where "capital can circulate without the cost and time of movement exceeding the profit potential linked to a given time of socially necessary movement.

<sup>21</sup> From the perspective of polarization as a determinant process in spatial inequality.

enables the synthesis of several already published studies, allowing the generation of new knowledge [...] (Botelho; Cunha; Macedo, 2011. p. 117).

The theme selected for the literature review<sup>22</sup> was the process of urban and regional polarization in the Semi-arid Northeast. For this research, the Google Scholar platform was selected, due to its ability to find studies in diverse databases that can bring together scientific articles, books, theses, dissertations, reports, technical notes, and gray literature<sup>23</sup> (Galvão e Ricarte, 2020). Chart 01 shows other information that demonstrates the delimitation of the bibliographic research.

The descriptors were selected to provide the platform's search engine with better possibilities to filter the results more focused on the delimited theme. Thus, between the words "semi-arid," "northeast," "brazil," "economy," and "urbanization," the Boolean operator of intersection *AND* was inserted. Between the words "pole," "polarization," "urban," and "regional," the equivalent operator of the union *OR* was applied. The application of this descriptors set resulted in a total of 11,800 results. Due to the high number of documents identified, words were inserted between the *AND NOT* operator to exclude documents that dealt with discussions unrelated to the theme established in the research<sup>24</sup>. The final total of documents reached after manipulating the descriptors was 278<sup>25</sup>.

**Chart 01 – Delimitation and other information about the bibliographic research**

<b>Selected period:</b>	Between 2000 and 2021
<b>Descriptors:</b>	semiarid <i>AND</i> northeast <i>AND</i> brazil <i>AND</i> economy <i>AND</i> urbanization <i>AND</i> pole <i>OR</i> polarization <i>OR</i> urban <i>OR</i> regional <i>AND NOT</i> environmental <i>AND NOT</i> health <i>AND NOT</i> virus <i>AND NOT</i> engineering <i>AND NOT</i> demography <i>AND NOT</i> agronomy <i>AND NOT</i> Latin
<b>Total results:</b>	278

**Source:** The Author (2023).

<sup>22</sup> This RBSI followed the steps described by Botelho, Cunha, and Macedo (2011).

<sup>23</sup> In the case of this work, only publications made at events were considered.

<sup>24</sup> In the advanced search of the Google Scholar platform, the sequencing of the application of the operators occurs in a specific way. Therefore, the sequence of descriptors was established in the following format: semi-arid northeast brazil economy urbanization pole OR polarization OR urban OR regional -environmental -health -virus -engineering -demography -agronomy -latin.

<sup>25</sup> The total was reached after excluding the results of patents and citations (selection fields located below the selection of the search period on the Google Scholar platform).



After reading the titles, abstracts, and keywords of the 278 documents found, the inclusion and exclusion criteria were applied. In each of them, titles and abstracts, the adherence of the content of the discussion to the delimited theme was verified. For the inclusion and exclusion of the materials in the RBSI, the criteria in Chart 02 were applied. After this stage, 41 documents remained.

In the categorization stage of the selected studies, two categorizations were performed. The primary was developed considering three characteristics: the year of publication, the territorial scope, and the theme addressed<sup>26</sup>. Chart 03 presents data on categorization.

**Chart 02 – Inclusion and exclusion criteria for bibliographic materials in RBSI**

<b>Inclusion:</b>	1 - Economic analysis in the northeastern semi-arid region; 2 - Analysis of the space production in the northeastern semi-arid region; 3 - Regional development in the northeastern semi-arid region; 4 - Economic activities in the northeastern semi-arid region.
<b>Exclusion:</b>	1 - The object deals with another geographical delimitation; 2 - Thematic outside of productive, urban, regional, and socioeconomic debate; 3 - The object of analysis outside the temporal frame; 4 - Duplicate.

**Source:** The Author (2023).

After this organization, due to the titles, abstracts, and many sections of the documents not having sufficient data to demonstrate adherence to the theme delimited for this RBSI, only the textual data of the sections that had discussions associated with the inclusion criteria previously determined were selected.

<sup>26</sup> As the objective of the proposal is to identify factors involved in the process of polarization of the northeastern semi-arid region and not to evaluate the quality of academic production nor to identify the most common types of academic work that deal with the subject, the documents were not categorized by type (scientific articles, theses, dissertations, etc.).

**Chart 03** – Characterization of the categories and their numerical frequencies.

Total Quantity					
Publication Year		Territorial scope		Thematic	
2004	1	Regional	13	Industrial Activities	12
2007	1	State	18	Agricultural Activities	6
2009	3	Municipal	10	Agricultural and Livestock Activities	1
2011	1			Livestock Activities	1
2012	2			Tertiary Activities.	1
2013	1			Regional Development	12
2014	2			Production of the space	6
2015	3			Local development	1
2016	1			Exports	1
2018	8				
2019	8				
2020	4				
2021	4				

**Source:** The Author (2023).

In the whole set, formed by the 41 documents, the data recovered dealt with discussions related to the productive, socioeconomic, urban, and regional conditions of urban areas in the Northeast Semi-arid region. Among the documents included, data were extracted from 76 sections. The textual data were unified in textual corpus format<sup>27</sup>, totaling 73 pages.

After the formatting of the corpus, it was the target of a reanalysis to verify the coherence between the themes dealt with in the set of texts. At this stage, the existence of general ideas interconnection discussed in the texts was confirmed. However, a deficiency

<sup>27</sup> According to the recommendations of Salviati (2017).

related to the lack of study more specific on the polarization process in the northeastern semi-arid region was identified. Botelho, Cunha, and Macedo (2011) deal with this type of obstacle in their discussions and warn about this condition<sup>28</sup>.

To remedy this deficiency, two sections of the study (in the form of a Thesis) by Alves (2017) were added, where the author discusses regional development and city networks in micro-regions<sup>29</sup> of the northeastern semi-arid region. With this addition, the total number of sections selected in the documents was 78, and the final textual corpus was formed by 93 pages<sup>30</sup>.

With the definitive *corpus*, a secondary categorization was performed with the aid of the Iramuteq software through lexical analysis of similarity. The use of the computational tool occurred due to a large amount of textual data (61,723 words and 408,144 characters, excluding spaces)<sup>31</sup>.

The computational processing allowed structuring the existing interconnections in the *corpus* and highlighting the terms that had greater relevance considering the co-occurrence between the words. According to Cunha and Souza (2022), the analysis of similarity (AS) allows the identification of the relatively most major themes according to the co-occurrence between the words. It provides the researcher with a visualization of ordinary parts and specificities of the textual data analyzed. In these terms, the AS processing sought to identify the trunking of fundamental interconnections between the texts, just as the paths of their branches.

In the generation of statistics and SA, the common noun and the verb were considered active keys for analysis<sup>32</sup>, and the additional noun and the additional verb were considered supplementary keys for analysis. The rest of the keys available in the software were eliminated from the analysis<sup>33</sup>. Due to the large number of active forms, seeking to generate a comprehensible AS graph were selected forms related to discussions on

<sup>28</sup> They remind us that one of the problems that can arise in an RBSI can be incompleteness due to the disregard of important data sources for the object under discussion.

<sup>29</sup> Mossoró (RN), Juazeiro Do Norte (CE), Campina Grande (PB), Petrolina (PE), Juazeiro (BA), and Paulo Afonso (BA).

<sup>30</sup> The web address <https://www.espacoeciencia.org/> is present in the "files" section: in item 03, the textual corpus processed by Iramuteq; in item 04, the list of documents and sections considered for the composition of the corpus; in item 05, the graphic configurations used to generate the graphic composition of the similarity analysis in the software; and in item 06, the active forms used are arranged.

<sup>31</sup> Salviati (2017) discusses in the form of a manual the use of the Iramuteq to treat large volumes of texts.

<sup>32</sup> Terminology adopted by the *software*.

<sup>33</sup> The *corpus*, containing 42 texts, was loaded into Iramuteq with the default segment size set to 40. That has generated a total of 1739 analysis segments. The number of words processed was 61,597. The number of active forms (nouns and verbs) was 2,694. The number of terms that appeared once (*hapax*) was 1,995, equivalent to 41% of the 4,867 total forms counted by the *software*.



The first point is about the publication years of the documents. It is possible to verify that after the publication of the IBGE studies (2008) on the Regions of Influence of Cities (REGIC), The emergence of studies that discuss issues about polarized urban areas has intensified. Between 2000 and 2008, only two documents related to the theme were identified. Everything else in the selected documents was published from 2009 onwards, highlighting the years between 2018 and 2021. The documents published during this period add up to a total of 24. In the time frame, another REGIC was published by the IBGE in 2020.

In this sense, the information existing in the REGIC studies may be related to the production of knowledge about polarization in the Northeast Semi-arid Region since they promote theoretical and databases for the development of research with different themes.

As for the territorial scope addressed in the documents, most of them deal with themes that involve questions related to the interior of the states of the Northeast or refer to specific municipalities. The states most cited in the studies are Ceará, Pernambuco, Rio Grande do Norte, and Bahia. Stand out in this study municipalities such as Campina Grande, Caruaru, Mossoró, Juazeiro do Norte, Juazeiro, and Petrolina. All of them have areas that exert regional polarizing power, according to the IBGE (2008; 2020). The documents that include the regional level, as a spatial cutout of approach, deal with issues focused on the Northeast and its semi-arid area. This set of information shows that the states that have the highest GDP<sup>35</sup>, in the delimitation of the Semi-arid Northeast, were the targets of a greater amplitude of studies that mention the conditions related to polarization.

Regarding the central themes of the documents, 12 of them deal with aspects related to the industrial sector. This finding may be related to the increase in industrial activity experienced in the Northeast over the first 15 years of the twenty-first century (Pereira Junior, 2015). Another 12 studies carry out analyses that involve aspects related to Regional Development. In part, these studies seem to be involved in the tradition that comes from the research carried out by the SUDENE Working Groups because the Northeast presents in the delimited period deficient socioeconomic conditions to other regions of the country, such as the Southeast and South.

Issues related to agricultural, agricultural and livestock, and livestock activities are pointed out in eight documents. Most of them discuss issues related to the agribusiness of fruit growing and the new conditions of agriculture in the irrigated perimeters of the São

---

<sup>35</sup>In 2019, the states with the highest GDP values were Bahia, Pernambuco, Ceará, and Rio Grande do Norte (IBGE, 2021).

Francisco Valley, the Jaguaribe Valley, and the area between the municipalities of Mossoró and Açu. These relationships confirm the great importance that agribusiness activity has in the productive structure of several areas of the semi-arid region of the Northeast. In addition, they demonstrate that the issue of polarization has strong relations with the primary sector.

Regarding the secondary categorization, carried out with the support of Iramuteq (figure 02), it is possible to verify seven groupings of relationships between words differentiated by colored halos<sup>36</sup>. In each halo, the size of the words represents their strength in the network of interactions in the textual corpus, considering the co-occurrence between the words. The thickness of the links between words demonstrates the measure of the frequency of the relationship.

The word groupings were delimited by the colored halos in red, pink, cyan, green, light blue, orange, and dark blue. The main words considered to define the groupings were the following: "city" in the red halo, "process" in the pink halo, "region" in the cyan halo, "microregion" in the green halo, "activity" in the light blue halo, "production" in the orange halo, and "municipality" in the dark blue halo. Based on these delimitations, we analyzed each of the halos of the graphic composition (figure 02) to provide a closer analysis of them, considering the general context of the interactions between the words.

Initially, we can identify that the active form (main word) that organizes all the graphic composition generated by the software is "city." It interconnects the interactions between the texts and makes a connection with the other groupings that expand into other halos, maintaining coherence with the main set.

Within the red halo, it is possible to visualize terms related to the processes that are part of the relations between urban areas as "flow," "network," "influence," "connection," "dynamism," "dynamics," "modernization" and "integration." Also present are words of equipment and phenomena that exist and occur commonly in urban areas such as "airport," "multinational," "shopping mall," "hypermarket," "supermarket," "university," "education," "teaching," and "unemployment."

In the same halo, it is also possible to see the names of municipalities that gained prominence in the hierarchy of the urban network of the northeastern hinterland as "Sobral," "Caruaru," "Mossoró," "Açu," "Arapiraca," and "Aracati." The urban areas of these municipalities are classified by the IBGE (2020), respectively, as Regional Capital C,

---

<sup>36</sup>The term "halo" refers to a visual representation, typical of Iramuteq, that highlights the most important active forms of a textual corpus to facilitate its identification and highlight relevant concepts. Halos make it easier to identify the relationships between active forms and the interpretation of textual data.

Regional Capital B, Regional Capital C, Subregional Center B, Regional Capital C and Subregional Center B. Associated with the productive activities carried out in the areas of the highlighted municipalities, the words, "petroleum," "agroindustry," and "aquaculture" can be visualized. Finally, there are terms within the red halo that refer to the theme determined in this RBSI such as "polarization," "center," "centrality," and "hegemony."

With these interconnections, the red halo exemplifies that polarized urban areas of the hinterland of the Semi-arid Northeast, even though they are not a place of a wide range of productive activities, have importance in the economies of their micro-regions and that they continuously concentrate the socioeconomic movements generated by these activities. In addition, it can be understood that it is from the concentration of equipment and institutions, of the public and private sectors, and specific productive activities that the productive organizations and the processes associated with capitalist dynamics are shaped by regions, micro-regions, and municipalities. In this sense, these findings can be interconnected with the conditions that promote the materiality of polarization and the formation of a hierarchical network between urban areas of the northeastern semi-arid region.

Concerning the pink halo, where the word "processes" is presented as a point of connection between the others, it shares its elements with the red halo. In this intersection, some words translate processes that may be related to the understanding of the term "polarization," discussed in the introductory part of this article. Tracing a logical sequence, considering the history of urban development in Brazil (Cano, 1998), the terms "industrialization," "expansion," "urbanization," "decentralization," and "restructuring" are duly related to the unequal production of polarized spaces in the semi-arid region of the Northeast.

Ideas of the forms of relationship between these terms, considering the conjuncture of Brazil's economic development, can be rescued in the work of Cano (1998) when he considers that, in each region of the country, the different socioeconomic and productive characteristics created a complex mosaic due to the interaction of differentiated relations within the logic of capitalist accumulation.

Considering these conditions allows us to visualize, using Harvey's (2013) ideas, urban areas as polarizing power, as places that present themselves not only as a locality that provides goods and services for a particular area of influence. It is possible to understand that they are part of the process of general transformation of the way of life of society by the capitalist mode of production. In this sense, the chain of relations between

words associated with the process of polarization seems to transpire in the thought of David Harvey, developed by Alves (2016). The author shows that cities present themselves, since their emergence, as places where the concentration of labor forces occurs, with the potential to extract surplus capital.

Due to the concentration of surplus capital, some urban areas are continuously transformed and start to present different forms and functions (Santos, 1994) that further articulate the ease of concentration of capitalist production. This shapes, around these locations, a spatial economy that is realized through the concentration of surpluses, mobilization of productive conjunctures, and expansion of their dynamics.

Another halo that has shared words, such as the grouping "city," is that the active form "micro-region" (green halo) is present. The sequence of relationships that unfold through it refers to associations between productive activities and the conformation of micro-regions. Among them, the condition of agribusiness activities focused on the export of production carried out in several municipalities that give their name to micro-regions present in the northeastern hinterland stands out, such as Mossoró and Açú in Rio Grande do Norte, Petrolina in Pernambuco and Juazeiro in Bahia (Alves, 2017).

Interconnected with the word "export" are, in sequence, "productivity" and "precariousness" that can be related, on the one hand, to the issue of high productivity in the agro-export sector due to access to tax benefits and irrigated perimeters, and on the other, to the precarious productivity and plundering of small farmers' crops<sup>37</sup>.

Also interconnected to the "cities" halo, but without intersecting areas, is the "activity" cutout (light blue halo). Right after the word "activities," it is possible to identify the representation of a condition already discussed by the IBGE (2008; 2020), on the polarized areas in the northeastern hinterland. For the agency, the centrality of these areas is traditionally more related to the supply of commerce and services to their adjacent areas.

The interconnections of the light blue halo that precedes the word "sector" also express another condition existing in the literature related to the economic development of the Northeast. It is the one that associates processes such as the "fiscal war," the increase of investments in productive infrastructure, the increase of credit and income of the population, and advances in the dynamization of the region's economy due to the implementation of industrial activities related to the manufacturing and textile sectors

---

<sup>37</sup> Alves (2017) exemplifies this condition by describing that due to land speculation in the vicinity of the irrigated perimeters carried out with the seal of the State, small producers were not contemplated by the initiative benefits.



(Pereira Junior, 2015; Alves, 2017; Monteiro Neto; Silva; Severian, 2021). According to Alves (2017), the relationships between these constraints have led to a reduction in obstacles to the investments of hegemonic capital (extra-regional and international) in peripheral areas of the semi-arid region of the Northeast<sup>38</sup>, as public and private actions aimed at raising productive infrastructure and strengthening the regional consumer market have been intensified (Alves, 2017).

At the same time that the interconnections within the light blue halo demonstrate advances in development, it is possible to find references to old socioeconomic structures linked to the blockade of economic development in the semi-arid Northeast, such as the latifundium.

The orange halo, which highlights the active form "production," presents interconnections demonstrating the most common productive activities in the *corpus* and their final products. Among them are the active forms "livestock," "agriculture," "cultivation," "fruit growing," "fruit," and "cotton." This condition demonstrates that even with the advance of industrial specialization in areas of the semi-arid region of the Northeast (Pereira Junior, 2015; Monteiro Neto; Silva; Severian, 2021), activities related to the agricultural sector have a greater territorial spread. In this group, there is an interconnection of fruit production aimed at export to Europe. A second group in the orange halo encompasses related words to expanding the capitalist process<sup>39</sup> into space.

In sequence considering the capitalist cycle, the words that derive from the main term are "capitalism," "market," "manufactures," "commercialization," "consumption," "specialize," and "outsourcing." They refer to the concept of "capital" as a value "in process" that continuously expands from the production of surplus value and its continuous search for overcoming contradictions such as the one defined by David Harvey when he identified that "the tension between the instability generated by newly formed capital and the stagnation associated with past investments is always present within the geography of capitalist production (Harvey, 2013, p. 572)".

In the orange halo, it is still possible to identify the interconnection with the term "production" of words such as "subsistence," "assistance," "developmentalism," and "backwardness." In the context of the semi-arid region of the Northeast, they possibly, once

---

<sup>38</sup> Regions close to polarized areas such as Mossoró (RN), Juazeiro do Norte (CE), Campina Grande (PB), Petrolina (PE), Juazeiro (BA), and Paulo Afonso (BA).

<sup>39</sup> Expansion in the sense of its intensification in the daily life of social dynamism and its geographical reach (Harvey, 2005). This sense of "capitalist expansion" is the same throughout the text.

again, make references, firstly, to the differentiated production conditions existing between the privileged agribusiness companies focused on fruit growing and the underserved small producers. Secondly, these terms may be related to the effects of the developmental policies implemented in the region between 2000 and 2010 (Alves, 2017). They were important for the development of productive infrastructure in polarized regions of the semi-arid region<sup>40</sup>, but at the same time, they were not enough to remove other areas of "backwardness."<sup>41</sup>

Another trunking of the graphic composition of AS, which derives from the term "city," is the one that develops from the word "region" (cyan halo). In it, in an area of intersection with the dark blue halo (active form "municipality"), it is possible to identify the metropolises of the Northeast and the states in which they are present, even though the texts from the corpus do not deal specifically with metropolitan areas. In addition, other locations stand out in agribusiness sectors in the states of Ceará, Pernambuco, and Bahia, such as the Jaguaribe Valley and the micro-regions of Juazeiro and Petrolina (Alves, 2017).

The cyan halo also exposes interconnections with words related to the condition of polarized areas in the Semi-arid region. The terms "concentration," "structure," "specialization," "heterogeneity," "investment," "loan," "globalization," "attraction," "inequality," and "poverty" reflect the reality of the areas of the semi-arid region that polarize and are polarized, considering differentiations in the hierarchy of the officially established urban network (IBGE, 2008; 2020).

Another well-delimited subset within the halo that has as its main active form the word "region" is the one that expands from the term "development." It contains an association of words that form a conjuncture that possibly interfered in the process of polarization of the target segment of this RBSI, such as "politics," "government," "strategy," "technology," "irrigation," and "highway." In this sense, to think that the relations between the urban areas that most benefit from the densification of fixed capital<sup>42</sup>, which take place in space, and those that remain in marginal positions, is to visualize the idea of Milton Santos in which he translates the areas of influence that are around polarized urban areas, such as regions of doing and regions of commanding (Santos, 1994). The author's idea is that:

In those regions where the system of objects and the system of actions are densest, . . . is the center of power. In those other areas where the system of objects and the system of actions are less complex and less intelligent,

---

<sup>40</sup> Areas of the interior are polarized by cities such as Mossoró (RN), Juazeiro do Norte (CE), Campina Grande (PB), Petrolina (PE), Juazeiro (BA), and Paulo Afonso (BA).

<sup>41</sup> In the sense of economic and urban stagnation.

<sup>42</sup> Related to political initiatives to promote productive activities, investments, infrastructure, and technology.

there is the seat of dependence on the inability to direct oneself. Region means to rule, but there are more and more regions that are only regions of doing, and less and less regions of commanding, regions of governing. Ones that are regions of doing are increasingly regions of doing for others (Santos, 1994, p. 57).

In addition, in the cyan halo, three active forms appear to be detached from the relationships with the closest words, but they have interconnections with the existing discussions in the *corpus*. They are "footwear," "tourism," and "mining." These three words seem to be associated, respectively, with the new industrial conditions in specific areas such as the Russas in Ceará, with the movements of interiorization of recent tourism, and with investments in the exploration of mineral deposits and areas with agricultural potential that have become economically viable, within the new perspectives of neo-extractivism<sup>43</sup>.

Inside the cyan halo is present the dark blue halo that has as its main active form the term "municipality." This excerpt presents words that are associated with other halos, such as red (main active form "city") and orange (main active form "production"), but due to an ordering of the texts within the *corpus*, the words may have been associated more strongly with the active form "municipality." Even so, they reinforce the existence of terms associated with the process of polarization in another web of interactions in the corpus with the presentation of the words "polarize" and "agglomerate." They also point out that the term municipality is closely associated, in the analyzed texts, with the words farmer and corn, which translates to the continuity of traditional agriculture in the northeastern semi-arid region.

Finally, considering all the inferences made between the categorizations, it is possible to apprehend that the discussion about the consolidation of the polarized areas of the northeastern semi-arid region, verified in the academic work analyzed, presents relevance and coherence with theories that discuss the unequal development of space in the context of capitalism.

The interconnections between the texts of the corpus demonstrate that, even though they are in a peripheral area of capitalism in Brazil and the Northeast, the areas of polarization in the hinterland of the Semi-arid Northeast occur through a conjunction of factors that cover different directions dispersed in multiple scales, which proceed according to the time and the area where expansion of capital in space occurs. From this perspective, through the analysis of the graphic composition, it can be apprehended that the

---

<sup>43</sup> The concept of neo-extractivism corresponds to a reconfiguration of traditional extractivism to support economic development strategies. See more in Milanez and Santos (2013).

consolidation of polarized areas in the Semi-arid Northeast is interconnected with broader factors such as:

- I. The Movement itself of Capitalist Expansion Over Space;
- II. The State's actions aimed at regional development, such as fiscal incentives and the maintenance of investments in irrigated perimeters created in the twentieth century.;
- III. Relationships implemented with international consumer markets due to exports of agribusiness products;
- IV. State policies to attract industrial activities;
- V. The intensification of flows between the regional metropolises (Salvador, Recife, and Fortaleza) with the interior areas of the semi-arid region of the Northeast;
- VI. The public and private investments made in productive infrastructure and the hub cities caused the emergence of advanced forms of commerce, such as hypermarkets and *shopping malls*;
- VII. The emergence and intensification of new industrial activities, such as the footwear and textile sector;
- VIII. The continuous productive specialization of urban areas that have greater polarizing power in the urban network of the Semi-arid region;
- IX. The maintenance of the relevance, although with less intensity, of extractive activities (salt and oil production) and traditional agriculture (cotton and corn crops) and the new productive conditions related to the condition of neo-extractivism;
- X. The expansion of the trade and services sectors is driven by regional economic growth, the increase in the supply of jobs, and the internalization of technical and university-level education institutions.

However, these ten findings are not the finalization of the understanding of the factors involved in the polarization of the Semi-arid region of the Northeast and are not determinant. In the excerpt delimited, they only point out ways to highlight and elucidate how the conjunctions of factors influenced the consolidation of polarizing urban areas.

The position among the ten points is also not a determination that they occur in the same sequence in all areas affected by the polarization process. Due to the unequal character of spatial production in capitalist dynamics, many of them can even get feedback with aid from others.

In addition, the sequencing was established according to a subjective interpretation based on the understandings confirmed between the analyses of the general graphic composition, its individual parts (halos), and the bibliographic references that discuss the productive evolution of regions in the interior of the Northeast. Therefore, it represents an attempt to systematize the heterogeneous and contradictory reality of the development of capitalist space in the twenty-first century.

Thus, the findings corroborate the theoretical view of urban and regional polarization as a process and not only as a condition resulting from the forces of allocation of fixed capital and the search for locations that accelerate the flow of capital in space. In this sense, we understand, as Brandão (2012, p.82) does, that "the notion of polarization does not need and should not be associated with concepts such as the driving industry, filtration effects, etc., nor should it always be [...] linked, as in the past, in some way, to the "distance" variable.

## **FINAL CONSIDERATIONS**

This RBSI, considering the basis of the classical theoretical contribution to the debate that interconnects ideas of economic, urban, and regional development, approached the term "polarization" as a process associated with the inhomogeneous production of capitalist space. The theoretical basis for this support was created from the interconnection of ideas of Carlos Brandão, David Harvey, and Milton Santos.

In this context, the research was carried out to search for factors related to the consolidation of regional centers in the Northeast Semi-arid Region in the national academic work conducted between the years 2000 and 2021. The application of this approach showed that research about the process of polarization in the interior areas of the Northeast has not advanced in the investigation of its conditioning factors or its relations with the blocked transmission of capitalist development.

It is visible that the academic work on the subject, for the most part, only reproduces the forms of theoretical approach and the results of IBGE studies. Due to this, the results of the studies viewed, in many cases, only corroborate the contributions that the agency has already evidenced about the hierarchy of cities in the Brazilian Northeast.

In addition, few studies address the condition of polarization as the main object. Most studies include the themes involved with the term only in an ancillary or descriptive way. Due to these reasons, for the execution of this RBSI, it was decided to select the

sections of the documents that addressed only aspects related to "polarization" as a process.

However, even with these obstacles, through the interpretation of the result of the AS carried out in Iramuteq, it was possible to verify that the interrelations between the texts expose several groupings of factors that contributed to the consolidation of regional centers in the northeastern semi-arid region. The ten notes, which bring together the factors involved in the polarization of the spatial delimitation, express processes that occurred at different times and intensities in each space of the Semi-arid Northeast. In this sense, the analyses of the AS point that results from them the creation of polarization movements and that they are more or less intense according to the local conjuncture of the factors that promote capitalist expansion over space.

Another point that deserves to be mentioned, even though it is not the target of this RBSI, is that the findings made corroborate, in part, the theoretical view of polarization as a process and not only as a condition resulting from the forces of allocation of fixed capital and the search for locations that accelerate the flow of capital in space.

Thus, to consider that the process of polarization acts in the conformation of spatial inequalities within the capitalist dynamics is to idealize that the study, more in-depth of its causes and developments on space, has the potential to highlight ways to make the concentration of economic and political-administrative power of the poles an opportunity for the development of urban areas that are in its vicinity.

Due to the RBSI methodology, this study was limited by the discussions present in the categorized documents. In this sense, their findings reflect, in a broad way, which factors were involved in the polarization of urban areas in the semi-arid region of Northeast Brazil. Each of these urban areas has closer or more distant links with one of the factors pointed out or even with others that were not reached by this RBSI due to limitations present in the selected studies themselves. Thus, the findings pointed out in this article should be considered only initial paths to be visualized for the development of research related to urbanized areas in the Semi-arid region of the Northeast.

## REFERENCES

ALVES, L. R. Região, urbanização e polarização. In: PIACENTI, C. A.; LIMA, J. F.; EBERHARDT, P. H. C. **Economia e desenvolvimento regional**. Foz do Iguaçu: Parque Itaipú, 2016. p. 41-52. Disponível em: <https://www5.unioeste.br/portalunioeste/arq/files/PGDRA/EconomiaeDesenvolvimentoRegional.pdf>. Acesso em: 05 mar. 2022.

- ALVES, A. M. **Políticas de desenvolvimento regional e rede de cidades no Semiárido: concentração, polarização e fragmentação**. 2017. 288 f., il. Tese (Doutorado em Geografia) - Universidade de Brasília, Brasília, 2017.
- ANDRADE, M. C. **Espaço, Polarização e desenvolvimento**: a teoria dos polos de desenvolvimento e a realidade Nordestina. Recife: Centro Regional de Administração Municipal, 1967.
- BOTELHO, L. L. R.; CUNHA, C. C. de A.; MACEDO, M. O método da revisão integrativa nos estudos organizacionais. **Gestão e Sociedade**, [S. l.], v. 5, n. 11, p. 121–136, 2011.
- BRANDÃO, C. A. **Território & desenvolvimento: as múltiplas escalas entre o local e o global**. Campinas: Editora da UNICAMP, 2012.
- BRENNER, N. **Espaços da urbanização: o urbano a partir da teoria crítica**. Rio de Janeiro, LetraCapital, 2018.
- CANO, W. **Desequilíbrios regionais e concentração industrial no Brasil**. Campinas: Editora UNICAMP, 1998.
- CLEMENTINO, M. L. M; PESSOA, Z. S. **Estudos prospectivos sobre o Desenvolvimento do Nordeste: desenvolvimento urbano**. Fortaleza. BNB. 2013. (Nota Técnica 166).
- COUTO, E. M. J.; ELIAS, D. Evolução do comércio e dos serviços em uma cidade média no Brasil. **Revista GeoUECE**, [S. l.], v. 4, n. 7, p. 09–35, 2021. Disponível em: <https://revistas.uece.br/index.php/GeoUECE/article/view/6922>. Acesso em: 9 mar. 2022.
- CORAGGIO, J. L. Hacia una revisión de la teoría de los polos de desarrollo. Versão revisada do artigo de mesmo título publicado em: **EURE**, II, num. 4, 1972.
- CUNHA, E.; SOUZA, W. Administração e indígenas no Brasil: conhecimento e interesse na pesquisa stricto sensu. **Cad. EBAPE.BR**, v. 20, n. 1, Rio de Janeiro, Jan./Fev. 2022
- FURIÓ, E. **Evolución y cambio en la economía regional**. Barcelona: Editorial Ariel, 1996.
- FRIEDMANN, J. Regional economic policy for developing areas. **Papers In Regional Science**, [S.L.], v. 11, n. 1, p. 41-61, jan. 1963. Wiley. <http://dx.doi.org/10.1111/j.1435-5597.1963.tb01889.x>.
- GALVÃO M. C. B.; RICARTE, I. L. M. Revisão Sistemática da Literatura: Conceituação, Produção e Publicação. **LOGEION: Filosofia da informação**, Rio de Janeiro, v. 6 n. 1, p.57-73, set.2019/fev. 2020.
- HAGGETT, P. **L'analyse spatiale en géographie humaine**. Paris: Armand Colin, 1973.
- HARVEY, D. **Condição pós-moderna**. São Paulo: Edições Loyola, 1992

HARVEY, D. **A produção capitalista do espaço**, São Paulo: Annablume, 2005.

HARVEY, D. **Os limites do capital**, São Paulo: Boitempo, 2013.

INSTITUTO BRASILEIRO DE GEOGRAFIA E ESTATÍSTICA – IBGE. **Regiões de Influência de Cidades**. Rio de Janeiro: IBGE, 2008.

INSTITUTO BRASILEIRO DE GEOGRAFIA E ESTATÍSTICA – IBGE. **Regiões de influência das cidades**. Rio de Janeiro: IBGE, 2020.

INSTITUTO BRASILEIRO DE GEOGRAFIA E ESTATÍSTICA – IBGE. **Produto Interno Bruto - PIB**. 2021. Disponível em: <https://www.ibge.gov.br/explica/pib.php>. Acesso em: 10 nov. 2021.

INSTITUTO BRASILEIRO DE GEOGRAFIA E ESTATÍSTICA - IBGE. **Semiárido Brasileiro**. 2022. Disponível em: <https://www.ibge.gov.br/geociencias/cartas-e-mapas/mapas-regionais/15974-semiarido-brasileiro.html?=&t=o-que-e>. Acesso em: 05 jul. 2022.

JESSOP, B. **Spatial Fixes, Temporal Fixes and Spatio-Temporal Fixes**. Blackwell Publishing, 2006.

JESSOP, B. BRENNER, N. JONES, M. Teorizando as relações socioespaciais. **Geographia**, [S.L.], v. 19, n. 41, p. 107-119, 25 jan. 2018. Pro Reitoria de Pesquisa, Pos Graduação e Inovação - UFF. Disponível em: <https://periodicos.uff.br/geographia/article/view/13814>. Acesso em: 08 fev. 2021.

MILANEZ, B.; SANTOS, R. S. P. Neodesenvolvimentismo e neoextrativismo: duas faces da mesma moeda. **Encontro Anual da ANPOCS**, v. 37, p. 1-30, 2013.

MONTEIRO NETO, A.; SILVA, R. O; SEVERIAN, D. O Território das atividades industriais no Brasil: a força das economias de aglomeração e urbanização. 2021. In: A. MONTEIRO NETO. (Orgs.) **Brasil, Brasis: reconfigurações territoriais da indústria no século XXI**. Brasília: IPEA, 2021. P. 255-314.

PERROUX, F. O conceito de pólos de crescimento. In: J. SCWARTZMANN (Org.) **Economia regional e urbana: textos escolhidos**. Belo Horizonte: UFMG, 1977.

PEREIRA JÚNIOR, E. Industrial dynamics and urbanization in the Northeast of Brazil. **Mercator**, [S.L.], v. 14, n. 4, p. 63-81, 23 dez. 2015. <http://dx.doi.org/10.4215/rm2015.1404.0005>. Disponível em: <https://www.scielo.br/j/mercator/a/yKwDGNYkGK56bKgFn78yzJz/?format=pdf&lang=pt> Acesso em: 12 ago. 2021.

SANTOS, M. **Técnica, espaço, tempo**. São Paulo: Hucitec, 1994.

SANTOS, M. **Economia Espacial: Críticas e Alternativas**. São Paulo: EDUSP, 2003.

SANTOS, M. **Por uma economia política da cidade: o caso de São Paulo**. São Paulo: EDUSP, 2009.



SALVIATI, M. E. **Manual do Aplicativo Iramuteq**: versão 0.7 Alpha 2 e R Versão 3.2.3. 2017. Disponível em: <http://www.iramuteq.org/documentation/fichiers/manual-do-aplicativo-iramuteq-par-maria-elisabeth-salviati> Acesso em: 05 abr. 2022.

\*\*\*