Revista Nacional de
Gerenciamento de Cidades
ISSN eletrônico 2318-8472, volume 11, número 84, 2023

"Shrinking Cities", the concept of urban shrinkage in different realities: a systematic review

Maria Gabriela Silva Lêdo
Master's student, FAAC/UNESP, Brazil.
maria.ledo@unesp.br

Maria Solange Gurgel de Castro Fontes
PhD Professor, FAAC/UNESP, Brazil.
solange.fontes@unesp.br

Maximiliano dos Anjos
Associate Professor, FAAC/UNESP, Brazil.
m.azambuja@unesp.br

Renata Cardoso Magagnin
Associate Professor, FAAC/UNESP, Brazil.
renata.magagnin@unesp.br

Revista Nacional de
Gerenciamento de Cidades
ISSN eletrônico 2318-8472, volume 11, número 84, 2023

ABSTRACT

The scientific literature on the term "shrinking cities" is recent, but translates an ancient phenomenon previously expressed, almost exclusively, by the term urban decline. In the mid-2000s, the new term gained prominence and began to have added meaning. Today, there is an effort to understand urban shrinkage as a global, multidisciplinary and multiscale phenomenon with multicriteria analysis. To identify how different authors work with this new approach, a systematic review of academic papers published in the SCOPUS and Web of Science databases was used. The results are scored from the general characterization of the research, the multiplicity of subjects that involve the term, the different analysis criteria for the same phenomenon, the need for a multidisciplinary analysis, the inequality in the places of study and the changes in the meaning of the expression according to the condition. The main discussions of the 19 works, which were part of the sample size, are conducted in relation to the origin/meaning/parameter of analysis of the term or, even, about its applicability in different places through case studies. Thus, the present study seeks to discuss how the term urban shrinkage transposes different contexts.

KEYWORDS: Shrinking Cities. Urban Decline. Urban Shirinkage.

1 INTRODUCTION

The term of study in this systematic review is "shrinking cities". As this research is approached in Portuguese and focused on the applicability of this term in Brazil, it is important to state that this term can be translated into portuguese as *"cidades encolhendo"*. In addition, there are other possible translations as *"encolhimento urbano"* or just *"encolhimento"*, corresponding, respectively, to the analogous terms: "urban shrinkage" and "shrinkage". Regarding the term "shrinkage", it may have different meanings depending on the area of knowledge that studies it and the translation used, in the case of studies in different languages and country of application (OSWALT, 2006; WEAVER; HOLTKAMP, 2015, MOREL-DORIDAT; HAMEZ, 2019; RECKIEN; MARTINEZ-FERNANDEZ, 2011; JESSEN, 2012). Regarding this issue, the authors Morel-Doridat and Hamez (2019) make an important contribution about the expression "shrinking cities", as they identified that the term is more used in recent researches.

According to researchers Oswalt (2006) and Weaver and Holtkamp (2015), this terminology was used in the 1960s and 1970s to analyze the decline of industrial cities in Germany, England and the United States.

For Reckien, Marthinezeckien and Martinez-Fernandez (2011 apud WEAVER; HOLTKAMP, 2015, p.1) and Fernendez (2011 apud WEAVER; HOLTKAMP, 2015, p.1) [1], the term urban shrinkage is not associated with the physical size of the city, but the losses generated by socioeconomic and/or demographic factors, such as income, employment, or number of residents.

Jessen (2012 apud WEAVER; HOLTKAMP, 2015, p.4) mentions that the functional, spatial, and morphological aspects of cities must be incorporated into the definition of urban shrinkage, with the aim of having a broader approach to this subject.

One frequently used definition, and employed by the SCIRN (Shrinking Cities International Research Network) group, considers that a shrinking city is one that has a densely populated urban area, generally with more than a thousand inhabitants, experiencing population loss for more than two years, and having undergone economic transformations with some symptoms of structural crisis (PALLAGST, 2009, p. 23) [2]. The increasingly heterogeneous

[1] Original text: Urban shrinkage refers not to physical reduction in city size, but to unplanned, widespread losses of jobs and population in a given (especially core) locality (RECKIEN; MARTINEZ-FERNANDEZ, 2011).
[2] Original text: "A shrinking city is a densely populated urban area with a minimum population often thousand residents that has faced population losses in large parts for more than two years and is

nature of the term makes it possible to incorporate not only purely demographic and urban, but also economic, political, or even social aspects into this study. Thus, the process no longer seems to be limited to the study of large cities; smaller and smaller urban centers are being studied, and the scales of analysis may vary neighborhood-wise and territorial-wise.

The different definitions for the term express a transformation in its meaning over the years, in which, at first, reflected a context of post-industrial crisis and population loss, and then, the economic factor began to be considered, and more recent studies incorporate other factors that enable a multidisciplinary investigation of this term, where each area of knowledge can contribute with new analysis parameters. Hence, the term is no longer limited to demographic explanation and begins to incorporate economic, political and social issues into the discussion. However, at the same time that the generalization of the process added analysis criteria and began to involve different areas of knowledge, this multiplicity of factors caused a certain confusion regarding the limits that the subject addresses, and brought to light the difficulty of establish a unity in the parameters that can help, for example, to identify a city in the process of shrinking.

Research shows that as it is an English term, there is no unity in its use or translations, wherein the multiplicity of approaches contributes to the dispersion of the term. Initiatives such as SCiRN (Shrinking Cities International Research Network) and CIRES (Cities Regrowing Smaller) end up not only bringing a certain unity to the concept but also encouraging new productions that seek to apply the term in different locations beyond the most frequent ones and define analysis variables that are coherent with the place of study.

The complexity of the term is also expressed in the other concepts that gravitate around urban shrinkage and are sometimes combined in a way that makes it difficult to differentiate when one concept begins and the other ends. An example of this is the concept of urban growth, as explained by Reis, Silva and Pinho (2016). For the authors, some methods used to analyze urban growth may be used to evaluate shrinkage, but shrinkage standards as well as suitable assessment methods are still lacking. Nonetheless, the number of occurrences of this process (of shrinkage) increases more and more, both due to the increase in cases and the effort to identify them in a category distinct from the already existing phenomena of urban change; growth, stagnation or shrinkage.

> Consequently, "shrinkage processes" will ostensibly be so ubiquitous that, losing all stigma, they will soon become as normal as growth processes. (AUDIRAC; FOL; MARTINEZ-FERNÁNDEZ, 2010. p.1)

In the article by Weaver and Holtkamp (2015), the authors precisely point out the relationship between the term's growth and shrinkage, when citing the works of authors Beauregard and Laursen: "growth and decline feed off each other" (BEAUREGARD, 1993, p. 21)[3] and "growth and decline should not be designated as a dichotomy, but… seen as two aspects [that are] mutually dependent and relational" (LAURSEN, 2012, p. 78).[4] Therefore, growth and shrinkage, although directly opposite, are not mutually exclusive; on the contrary, they generally

undergoing economic transformations with some symptoms of a structural crisis " (PALLAGST *et al.* , 2009, p. 23).

[3] Original text: "growth and decline feed off each other" (BEAUREGARD, 1993, p. 21).

[4] Original text: "growth and decline should not be designated as a dichotomy, but…seen as two aspects [that are] mutually dependent and relational" (LAURSEN, 2012, p. 78).

occur mutually on different scales and, thus, one can indicate the other. Spaces are not homogeneous, it is precisely spatial heterogeneity that is the defining characteristic of cities (LAURSEN, 2009) [5], which is why it is so important to think about a multi-scale assessment.

Another concept closely associated with urban shrinkage is urban decline, which results in a mixture and, consequently, confusion of definitions. Both seem to characterize the same phenomenon, but the most recent aspect of the concept of urban shrinkage has sought to distance itself from the term decline, which despite being more consolidated and widely publicized, often conveys a pejorative connotation. For a long time the term urban decline was frequently used, but nowadays, a new concept seems to be great to add up meanings, broaden the discussion and thus explain a different phenomenon that has unique characteristics. Urban decline can be part of the phenomenon of urban shrinkage, but this is not a rule or at least it does not have just one interpretation, it will depend a lot on the factors analyzed and context; it is a study with a specific structuring that is increasingly closer to the particular object of study and increasingly distant from a generalist analysis.

In this regard, it can be said that the term "shrinking cities" explains an old phenomenon but which for a long time was incorporated into the concept of urban decline and strongly marked by a purely demographic analysis. However, it was noticed recently the need to dissociate the terms, or at least, their pessimistic and restricted aspects, which was no longer sufficient to express all this new semantic load that urban shrinkage seeks to add. This entire discussion of terms is fundamental both to understand the concept of "shrinking cities" and its trajectory and to justify the choice of terms used in the searches carried out in the databases and subsequent selection of articles that are part of the systematic review.

Based on the different terminologies and approaches to this topic, this article seeks to identify whether the term "shrinking cities" is a new term that emerges to elucidate an old or recent phenomenon or not. This question justifies the choice and importance of this topic to understand some similar processes in Brazil.

2 OBJECTIVE

The aim of this article is to present a systematic review of the term "shrinking cities", to identify its application in different contexts.

3 METHODOLOGY

With the aim of understanding the trajectory of the use of the term "shrinking cities" and its different approaches, the present study carried out a systematic review, based on the establishment of a protocol for the review and selection of academic works through three stages: (I) identification of electronic databases to be used and definition of search criteria, (II) definition of analysis and data collection parameters, (III) analysis and synthesis of results.

The research was developed with two databases: Web of Science and SCOPUS, which presented a satisfactory number of results with articles relevant to this study. In the SCOPUS database, the screening was carried out using the combination of terms: "urban decline" AND "shrinking cities" AND "shrinkage", which returned a total of 37 papers of which only 7 were

[5] "spatial heterogeneity is a defining characteristic of cities" (EG; LAURSEN, 2009).

freely accessible. In addition, the filter for area of study was used to include the following areas: Social Sciences, Environmental Science, Earth and Planetary Science, Business/Management/Accounts, Economics/Econometrics/Finance and Engineering. The areas of Medicine, Biochemistry, Agriculture and Energy were not included. The final amount was 33 papers.

In the Web of Science database, the screening selected articles in the following are as of study: Urban Studies, Geography, Public Administration, Ecology in Environmental Sciences, Architecture, Business & Economics, and History. Of the 270 articles found, only 64 had free access.

With the checking of title duplications, the final number of publications selected for the next stage was 96. These were then organized in an electronic spreadsheet so that they could undergo validation that incorporated two main criteria, one for inclusion and the other for exclusion: (I) inclusion of works that defined the term object of investigation, and with analysis parameters that could incorporate categories/typologies of urban shrinkage, and (II) exclusion of articles whose content assessed only the aspect of population/demographic reduction.

Based on these criteria, the articles were classified as: very relevant, relevant, somewhat relevant, and not relevant. The very relevant subject was one that closely adhered to the theme, which incorporated the concepts and showed different applicability; the relevant subject was one that dealt with the topic from an interesting perspective that could, in part, make a "link" with the study; the subject that was somewhat relevant was one that, despite dealing with the topic, used the term in a very specific way, making it difficult to "link" with the study, used the term to explain another phenomenon or emphasized a step further on the topic (for example, to discuss revitalizations). Finally, the not relevant subject was one that used the term in such a way that it was not possible to establish a direct relationship with the study.

From this screening, only 19 articles classified as "very relevant subject" were selected, including four from the SCOPUS database and 15 from Web of Science.

The third stage made it possible to systematize the data from the selected articles into two groups, the first one corresponding to a general characterization of the 19 articles, which includes: title, author(s), periodical, study locations, year of publication, keywords, and the journal's evaluation areas. The second referring to a specific characterization of the articles: scale of the object, methodology, collection and analysis technique, source, time frame, main subject, and types of shrinkage.

4 RESULTS

The results are presented in two parts and by two tables. The first stage refers to a general characterization of the 19 articles, and the second includes specific details.

Table 1 – General characterization of the 19 selected articles

N	Data Base	Article Title	Author(s)	Periodical	Study locations	Year	Key words	Journal evaluation area
1	SCOPUS	The meaning of «smart shrinkage». The ambiguity of rightsizing	Béal, V., Fol, S., Rousseau, M.	Geography, economy, society	**USA** (None specific, but emphasis on Detroit)	2016	American cities; Rightsizing; Shrinking cities; Smart	-Geography, Planning and Development. -Economics and Econometrics.

Revista Nacional de
Gerenciamento de Cidades
ISSN eletrônico 2318-8472, volume 11, número 84, 2023

N	Data Base	Article Title	Author(s)	Periodical	Study locations	Year	Key words	Journal evaluation area
		urban policies in American cities					shrinkage; urban decline; Urban policies	
2	SCOPUS	What drives planning in a shrinking city? Tales from two German and two American cases	Pallagst, K., Fleschurz, R., Said, S.	Town Planning Review	**Germany and USA** (Germany: Zwickaue Kaiserslauternn USA: Flint/MI and Youngstown/ OH)	2017	Comparative planning; Planning cultures; planning styles; Shrinking cities; Urban regeneration	-Urban Studies. -Geography, Planning and Development.
3	SCOPUS	Geographical Approaches to Understanding Urban Decline: From Evolutionary Theory to Political Economy...and Back?	Weaver, R., Holtkamp, C.	Geography Compass	**USA** ("Sublocal perspective and theories":Buffalo, Pittsburgh, Los Angeles and Seattle)	2015	Does not contain Freely assigned words: suburbanization, population change, deindustrialization, urban change, shrinkage, shriking cities	-General Social Sciences, Earth-Surface Processes. -Water Science and Technology.- Computers in Earth Sciences.- Atmospheric Science.
4	SCOPUS	Shrinking cities in a time of crisis	Ivonne, A., Sylvie, F., Martinez - Fernandez, C.	Berkeley Planning Journal	**Germany, France and Japan** (Berlin, Leipzig, Paris and Osaka)	2010	Cities; spatial theory; urban shrinkage	-Geography, Planning and Development.
5	WEB OF SCIENCE	Spatial metrics to study urban patterns in growing and shrinking cities	Reis, JP; Silva, EA; Pinho, P	Urban Geogra-phy	**Europe and North America** (None in particular)	2016	urban growth, spatial patterns, spatial metricsurban, shrinkage	-Urban Studies. -Geography, Planning and Development.
6	WEB OF SCIENCE	The diversity of North American shrinking cities	Hartt, M.	Urban Studies	**USA** 20 largest cities that shrank the most	2018	demographic change, economic decline, globalization, shrinking cities, urban change	Environmental studies - SSCI. -Urban Studies - SSCI
7	WEB OF SCIENCE	Historical trajectories of currently shrinking Portuguese cities: A typology of urban shrinkage	Alves, D; Barreira, AP; Guimaraes, MH; Panagopoulos, T.	Cities	**Portugal** 25 cities	2016	Shrinking cities, Urban history, Urban theory, Portuguese cities	-Urban Studies
8	WEB OF SCIENCE	A meta-analysis of shrinking cities in Europe and Japan. Towards an integrative research agenda	Doringer, S; Uchiyama, Y; Penker, M; Kohsaka, R.	European Planning Studies	**Europe and Japan** 100 cities in Japan and Europe	2020	Cross-continental comparative perspective, urban shrinkage, shrinking cities, meta-analysis, EU, Japan.	Environmental studies -Geography-Regional & Urban planning-Urban studies.

Revista Nacional de
Gerenciamento de Cidades
ISSN eletrônico 2318-8472, volume 11, número 84, 2023

N	Data Base	Article Title	Author(s)	Periodical	Study locations	Year	Key words	Journal evaluation area
9	WEB OF SCIENCE	The Prevalence of Prosperous Shrinking Cities	Hartt, M.	Annals of the American Association of Geographers	**USA** (It names several, but none is specifically the subject of study)	2019	demographic change, economic prosperity, shrinking city, urban decline.	-Geography
10	WEB OF SCIENCE	Shrinking municipalities and their budgetary revenues on the example of the Warmian-Masurian Voivodeship in Poland	Wichowska, A.	Oeconomia Copernicana	**Poland** 116 municipalities in the Warmian-Masurian Voivodeship region, a region with little economic development	2019	municipal budgets, local revenue, demography, aging of the population, shrinking cities.	-Business & Economics
11	WEB OF SCIENCE	Demographic and morphological shrinkage of urban neighborhoods in a post-socialist city: the case of od, Poland	Kazimierczak, J; Szafranska, E	Geografiska Annaler Series B-Human	**Poland** (Lodz)	2019	Urban decline, demographic and morphological urban shrinkage, intra-urban scale of analysis, urban regeneration area, spost-socialist cityod	-Geography
12	WEB OF SCIENCE	Research on Large-Scale Urban Shrinkage and Expansion in the Yellow River Affected Area Using Night Light Data	Niu, W.H.; Xia, HM; Wang, R.M.; Pan, L; Meng, QM; Qin, Y.C.; Li, RM; Zhao, XY; Bian, XQ; Zhao, W.	ISPRS International Journal of Geo-Information	**China** (Yellow River Area, covering 13 provinces and 531 cities)	2021	night light data. urban shrinkage, urban expansion, natural city, Yellow River, affected area.	-Computer Science, Physical Geography, Remote Sensing.
13	WEB OF SCIENCE	I come to bury (population) growth, not to praise it	Franklin, RS	Spatial Economic Analysis	**USA** (US regional subdivisions)	2020	depopulation, demographic change, shrinking cities.	-Business & Economics
14	WEB OF SCIENCE	Shrinking of Cities in the Czech Republic and its Reflection on Society: Case Study of Karvina City	Sery, O; Svobodova, H; Silhan, Z; Szczyrba, Z.	Geographica Pannonica	**Australia, Czech Republic** (city of Karvina) and **26 European countries.**	2018	shrinking city, depopulation, Karvina, economically problematic region, questionnaire surveys, semi-structured interviews	-Geography

N	Data Base	Article Title	Author(s)	Periodical	Study locations	Year	Key words	Journal evaluation area
15	WEB OF SCIENCE	The role of Leipzig's narrative of shrinking	Mace, A; Volgmann, F.	Urban Geography	**Germany** (Leipzig)	2018	Foundational stories, Leipzig, narratives, shrinking cities, urban planning	-Geography, Urban Studies
16	WEB OF SCIENCE	Urban shrinkage in a 'shrinking' Serbia - the approach to a global phenomenon in a local context	Djukic, A; Antonic, B; Vujicic, T.M.	Geodetski Vestnik	**Serbia** (25 cities distributed in 3 groups)	2017	Urban planning, urban shrinkage, post-socialist city, global-local, Serbia	-Geography
17	WEB OF SCIENCE	Does the process of shrinking also concern small towns? Lessons from Poland	Bartosiewicz, B; Kwiatek-Soltys, A; Kurek, S.	Quaestiones Geographicae	**Poland** (661 small centers)	2019	shrinking small towns, depopulation processes, demographic transformation of small towns	-Geography
18	WEB OF SCIENCE	Scientific research on shrinking cities: bibliometric contribution	Morel-Doridat, F; Hamez, G.	CybergeoEuropean Journal of Geography	**France** (no specific city)	2019	shrinking cities, urban decline, bibliometry, urban planning, databases	-Geography
19	WEB OF SCIENCE	Shrinking cities, applied case of ferrol	Bust, AL; Ramos, BA	ACE-Architecture City and Environment	**Spain** (Ferrol)	2019	Shrinkage, Galicia, indicators, strategies	-Urban studies architecture.

Source: From the authors, 2022.

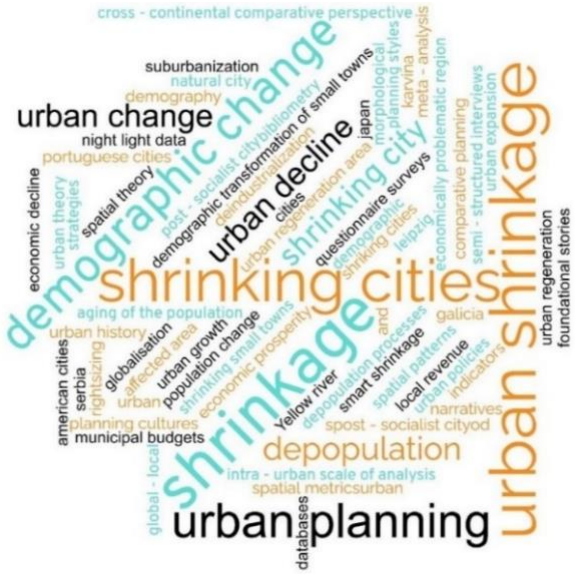
Of the 19 articles, eight (42.10%) were published in journals in stratum A1 (BÉAL; FOL; ROUSSEAU, 2016; REIS; SILVA; PINHO, 2016; HARTT, 2018; ALVES *et al.*, 2016; DORINGER *et al.*, 2020; WICHOWSKA, 2019; MACE; VOLGMANN, 2018; MOREL-DORIDAT; HAMEZ, 2019). In stratum A2 there are four (21.05%) articles (HARTT, 2019; KAZIMIERCZAK; SZAFRANSKA, 2019; NIU *et al.*, 2021; FRANKLIN, 2020). In classification A3 there are two (10.53%) articles (PALLAGST; FLESCHURZ; SAID, 2017; BARTOSIEWICZ; KWIATEK-SOLTYS; KUREK, 2019). In A4 there were three (15.80%) articles (IVONNE; SYLVIE; MARTINEZ-FERNANDEZ, 2010; ŠERÝ *et al.*, 2018; DJUKIC; ANTONIC; VUJICIC, 2017). Finally, there was one article in stratum B1 (5.26%) and another in B2 (5.26%), the first one by Busto and Ramos, 2019; and the second by Weaver and Holtkamp, 2015 (data from Table 1). The main journals publishing the articles were Urban Geography, Cities, Urban Studies and European Planning Studies.

Among the selected articles, two (10.53%) were published in the journal "Urban Geography", and the other journals had only one occurrence. Analyzing the evaluation area of each journal, it can be seen that the highest occurrence of publications was in journals whose main subject is "Geography" (11 articles, 57.89%). The second largest number of occurrences is much smaller than the first, and are published in journals whose main subject can be summarized as "spatial planning" (three articles, 15.80%). These results reinforce that the field of Geography is notoriously the one that produces the most articles related to the topic (Table 1).

The majority of articles analyze more than one location, 49 (77.56%) are studies applied in European countries (Germany, France, Serbia, Spain, Portugal, Poland, Czech Republic and 26 other countries). This representativeness can be explained by the beginnings of the manifestations of the term "shrinking cities" and the "boom" of research that occurred in European territory in the 2000s. Another seven occurrences (14.28%) were applied in North America (United States), due to the large number of research that evaluates post-industrial cases, in addition to the expression "shrinking cities" itself being in English, which facilitates its dissemination and repercussion in these places. Asia totals three (6.12%) studies, two in Japan and one in China. And finally, in Oceania there is only one (2.04%) occurrence, represented by a study in Australia. Although most of the studies include European countries as an object of study, the "escape from the commonplace" occurs through different cities, scales or the comparative nature of the articles.

The publication period of the articles is from 2010 to 2021. The oldest article dates back to 2010, the other studies are within the last 10 years (from 2015 to 2021). The majority of articles (six or 31.58%) are from 2019, demonstrating the recent popularity of the term analyzed.

Figure 1 - Word Cloud



Source: From the authors, 2022

As a result of the keyword analysis, the word cloud was created (figure 1), from which it was identified that the main terms in the articles were: shrinking cities (nine occurrences, 27.27%), followed by urban shrinkage, urban decline, shrinkage (four occurrences each, 12.12%); urban planning and demographic change (three occurrences each, 9.09%); and urban change, shrinking city and depopulation (two occurrences each, 6.06%). With this analysis, the terms that contain the verb "to shrink" in their etymology are the majority: if added together, they total 23. It is also noteworthy that the term "shrinking cities" (inflection of the verb in the gerund) has the highest occurrence, with a number greater than twice the second position "urban shrinkage".

Table 2 – Specific characterization of the 19 selected articles

Revista Nacional de
Gerenciamento de Cidades
ISSN eletrônico 2318-8472, volume 11, número 84, 2023

N	Object scale	Methodology	Collection technique	Analysis technique	Source	Temporal cut	Main subject	Type of Shrinkage
1	Big cities	Literature review	Bibliographic research	Analysis by category	Secondary	1990 - 2016	Urban Policies, Smart Shrinkage	Conceptual Study
2	Small towns	Case study	Documentary Research	Analysis by category	Primary	1900 - 2010	Urban planning	In deindustrialization hotspots
3	Neighborhoods	Literature review	Bibliographic research	Analysis by category	Secondary	1900 - 2000	Urban Decline, Urban Growth	Conceptual Study
4	Big Cities Suburbs	Case study	Bibliographic research	Analysis by category	Secondary	Berlin (1990 - 2010) Leipzig (1966 - 2010) Suburbs of Paris (1960 - 2010) Osaka (1980 - 2010)	Urban Decline, Deindustrialization	-In hotspots of deindustrialization -Cyclical -Due to globalization -Urban in the long term
5	Does not classify	Literature Review through quantitative methodologies	Bibliographic Research Bibliographic Review Systematic Review	Documented Analysis	Secondary	2000 - 2016	Urban Decline, Urban Growth	Conceptual Study
6	Big cities	Case study	Documentary Research	Analysis by category	Primaries	from 1980 to 2010	Urban Decline, Urban Growth, Globalization	Due to globalization
7	Varied Types	Case study	Documentary Research	Analysis by category	Primaries	1878 - 2011.	Urban Decline, Analysis Parameters	-Early persistent -Metropolitan -In deindustrialization hotspots -Cyclical -Mild -Long term
8	Varied Types	Meta-analysis	Bibliographic research	Statistical analysis of data; Analysis by category.	Secondary	2005 - 2017	Urban Decline, Meta-Analysis	Conceptual Study
9	Varied Types	Case study	Documentary Research	Comparative Analysis; Analysis by category.	Primary	1980 - 2010	Urban Decline, Prosperity	Conceptual Study
10	Varied Types	Case study	Documentary Research	Linear correlation analysis; retracement analysis	Primary	2012 - 2017	Urban Decline, Economy	Cyclic
11	Neighborhoods (up to 40	Case study	Documentary Research	Analysis by category	Primary	1988 - 2013 (from	Urban Decline,	Cyclic

N	Object scale	Methodology	Collection technique	Analysis technique	Source	Temporal cut	Main subject	Type of Shrinkage
	thousand inhabitants)					1988 to 2002 and from 2003 to 2013)	Urban Morphology	
12	Varied Types	Case study	Documentary Research (satellite images)	Analysis by Category	Primary	2013-2018	Urban Decline, Urban Morphology Territorial Limits Form of Analysis	Cyclic
13	Regional Scale	Case study	Documentary Research	Analysis by category	Primary	2000 - 2010	Urban Decline, Urban Growth, Regional Scale	Conceptual Study
14	Small town	Case study	Documentary Research Application of Questionnaire Application of Semi-structured Interviews	Analysis by category; Quantitative analysis.	Primary	2009-2013	Urban Decline	-Cyclical -Mild -Long term
15	Big city	Case study	Bibliographic research	Analysis by category	Secondary	1990-2018	Forms of analysis, Conceptualization	Conceptual Study
16	Small town	Case study	Documentary Research	Analysis by category	Primary	No info	Urban Decline, Post-socialism	Cyclic
17	Small town	Case study	Documentary Research	Analysis by category	Primary	2002-2014	Urban Decline, Small Cities, Regional Scale.	Cyclic
18	Does not classify	Bibliometric analysis	Bibliographical Research (ASC and Francis)	Documented analysis; Analysis by category.	Secondary	1990-2016	Conceptualization, Bibliometrics	Conceptual Study
19	Small town	Case study	Bibliographic research	Analysis by category (SWOT analysis)	Primary	1983-2015 (each indicator is a time frame)	Indicators, Urban Policies	-In hotspots of deindustrialization -Due to globalization

Source: From the authors, 2022.

Among the articles that were part of the sample size, the numbers and scale typologies of the object of study reflect the initial objective of selecting those works that sought a scale of analysis different from the most usual ones or even combining different types. In this sense, the

two most frequently occurring typologies are “Small Town” (five articles, 26.32%) and “Varied Types” (five articles, 26.32%). The amount of the latter is justified by the large number of case studies that chose to analyze more than one city and/or scale. The “Big City” still appears with a good number of results (four articles, 21.05%), but it is necessary to note that if compared to the sum of the most unusual scale elements the difference is large, that is, the sum of the 15 articles surpasses the four manifestations of studies on large cities by 11. This subverts the reality of when the term “shrinking cities” began to be used, a period in which large cities were exclusively the focus of studies. The “Neighborhood” scale is also represented by two articles (10.52%) as well as the “Region” scale with one occurrence (5.27%). Finally, only two articles (10.52%) do not classify the scale analyzed (Table 2).

As for the methodology used to discuss the topic, it can be divided into two groups: the first one composed of those articles that are a case study (14 articles, 73.68%) and those that discuss the topic (five articles, 26.32%) through a literature review (three articles, 60%), meta-analysis (one article, 20%) or bibliometrics (one article, 20%). Because they are recent, the object of investigation of the case studies is to explore varied typologies, and discussions on the topic seek to address the concept in a more specific way, using consolidated concepts, but without making these the only source of information and justification for all the rhetoric proposed (Table 2).

Considering the 2 typologies previously identified, it is possible to make a relationship between the ways of collecting data, sources, and search locations. In case studies, the primary source and documentary research technique are mainly used and data collection is carried out mostly in databases and institutions (BARTOSIEWICZ; KWIATEK-SOLTYS; KUREK, 2019; DJUKIC; ANTONIC; VUJICIC, 2017; ŠERÝ et al., 2018; FRANKLIN, 2020; NIU *et al.*, 2021; WICHOWSKA, 2019; HARTT, 2019; ALVES; *et al.*, 2016; HARTT, 2018; PALLAGST; FLESCHURZ; SAID, 2017). In another way, in review articles, bibliometrics or meta-analysis, secondary sources and the bibliographic research technique are more used, based on data collection carried out in educational institutions, databases of academic works, libraries and museums (BÉAL; FOL; ROUSSEAU, 2016; WEAVER; HOLTKAMP, 2015; IVONNE; SYLVIE; MARTINEZ-FERNANDEZ, 2010; REIS; SILVA; PINHO, 2016; DORINGER et al., 2020; MACE; VOLGMANN, 2018; MOREL-DORIDAT; HAMEZ, 2019). Therefore, with the greater number of case studies, the greater is the number of articles whose data collection technique is documentary research (Table 2).

There is a relationship between data analysis techniques and article methodologies. The majority (17 articles, 89.47%) presented an analysis by category, that is, they subdivided the data obtained in order to extract the necessary information. For example, of those more conceptual research (review, meta-analysis and bibliometrics), the article by Béal, Fol and Rousseau (2016) analyzes the data by category, dividing into two typologies: operational and critical work. In the article by Weaver and Holtkamp (2015), the three schools of thought were used as categorization. In articles that use the case study method, the authors Ivonne, Sylvie and Martinez-Fernandez (2010) analyze the data by category considering the size, place of occurrence and type of shrinkage.

When examining the time frames of analysis, it can be observed that those whose time span is longer are research related to the more conceptual study of the term, or are those that have many cities as the object of study and/or from different historical periods. The majority of articles (11 articles, 57.89%) cover the turn of the 20th century to the 21st century (from 1980 to 2001) while the others (eight articles, 42.11%) are more recent (2001 onwards). This indicates

that part of the most recent studies are revisiting older cases from a new perspective, and the other part is committed to advancing the discussion based on new examples and diverse situations.

When analyzing the main topics covered, the number of occurrences exceeds 19 as the same article can incorporate different themes as well as different shrinkage typologies as it deals with more than one object of study and/or is a theoretical discussion. The main topics identified and distributed among the articles were: Urban Shrinkage, Urban Growth, Parameters/Forms of Analysis, Conceptualization of the Term, Urban Policies, Regional Scale, Urban Morphology, Meta-analysis, Globalization, Deindustrialization, Bibliometrics, Small Cities, Post-socialism, Territorial Limits, Economy, Urban Prosperity, Urban Planning and Smart Shrinkage. The subject "Urban Shrinkage" is the one with the highest number of manifestations (appears 14 times, 34.15%), and this can be attributed to the keyword "shrinking cities" used in the search, as well as the synthetic power that this term has by representing a broad concept. Furthermore, it is worth mentioning that all four (9.76%) occurrences of "Urban Growth" were associated with the term "Urban Shrinkage", which shows the correlation constantly made between these two concepts. "Parameters/Forms of analysis" also appears four times (9.76%). The subjects "Conceptualization of the Term", "Urban Policies", "Regional Scale" and "Urban Morphology" occur twice each (4.88% each), and the other subjects (11) have only one occurrence each, that is, each one represents 2.43% of the total (Table 2).

Finally, regarding shrinkage typologies, it is observed that most of the typologies analyzed involve current issues or issues that persist to this day. Even the less recent typologies present a study marked by a new interpretation, with modifications, adaptations, and additions of meanings. The typology with the highest number of occurrences, "Cyclic Shrinkage" (nine or 28.12%), focuses on political transformations, a recent indicator compared to those most commonly used in the analysis of urban shrinkage when the concept emerged. The other typologies identified and their respective occurrences were: "In Deindustrialization Hotspots" (six or 18.75%), "Long-Term Shrinkage" (six or 18.75%), "Due to Globalization" (five or 15, 63%), "Mild Shrinkage" (two or 6.25%), "Metropolitan Shrinkage" marked by expansion difficulties (one or 3.125%), "Early Shrinkage" due to rural exodus (one or 3.125%), "With Determined Time" (one or 3.125%) and Irregular (one or 3.125%).

5 CONCLUSION

Urban growth is not perpetual nor is it healthy, therefore, delving into issues that are part of urban life and that keep it functioning dynamically is fundamental. This study brought as an example the discussion of the term "shrinking cities", translated for Portuguese as "encolhimento urbano", a recent term that, despite describing an old phenomenon, requires a better characterization, less pessimistic, more comprehensive and equipped with analysis parameters so that the term can spread more and more, with variation in its applicability and adapting to the local context without losing its unity. Therefore, this systematic review, in addition to presenting the term, also discussed its meanings, based on the different approaches of the evaluated works. In conclusion, the applicability of the term can also be made through case studies in the Brazilian reality, since the country has cases that can be identified as urban shrinkage.

6 REFERENCES

ALVES, D.; BARREIRA, A. P.; GUIMARÃES, M.H.; PANAGOPOULOS, T. Historical trajectories of currently shrinking Portuguese cities: A typology of urban shrinkage. **Cities**. 2016.

AUDIRAC, I.; FOL, S.; MARTINEZ FERNÁNDEZ, C. Shrinking Cities in a time of crises. **Berkeley Planning Journal**, 23, pp. 51-57. 2010.

BARTHOLOMAE, F.; NAM C. W.; SCHOENBERG A. M. **Urban shrinkage and resurgence in Germany**. Urban Studies. 2016.

BARTOSIEWICZ, B.; KWIATEK-SOŁTYS, A.; KUREK, S. **Does the process of shrinking concern also small towns? Lessons from Poland**. Quaestiones Geographicae 38(4), Bogucki Wydawnictwo Naukowe, Poznań, pp. 91–105. 2019.

BÉAL, V.; FOL, S.; ROUSSEAU, M. **De quoi le « smart shrinkage » est-il le nom? Les ambiguïtés des politiques de décroissance planifiée dans les villes américaines**. Géographie, Économie, Société, 18, 2, 2016. 211-234, <https://doi.org/10.3166/ges.18.211-234>. 2016.

BEAUREGARD, R. Voices of decline: the postwar fate of US cities**. Blackwell: Oxford**. 1993.

DJUKIC, A.; ANTONIC, B.; VUJICIC, T. M. Urban shrinkage in a 'shrinking' Serbia – the approach to a global phenomenon in a local context. **Geode-tski Vestnik**. - DOI: 10.15292/geodetski-vestnik.2017.04.614-629. 2017.

DÖRINGER, S.; UCHIYAMA, Y.; PENKER, M.; KOHSAKA, R. **A meta-analysis of shrinking cities in Europe and Japan.** Towards an integrative research agenda, European Planning Studies, 28:9, 1693-1712, DOI: 10.1080/09654313.2019.1604635. 2020.

FRANKLIN, R. S. **I come to bury (population) growth, not to praise it.** Spatial Economic Analysis, 15:4, 359-373, DOI: 10.1080/17421772.2020.1802056. 2020.

HABITAT, U. N. **State of the World's Cities 2012/2013: Prosperity of Cities.** New York, NY: Routledge. 2013.

HARTT, M. **The diversity of North American shrinking cities.** Urban Studies 55 (13), pp. 2946-2959. 10.1177/0042098017730013. 2018.

HARTT, M. **The Prevalence of Prosperous Shrinking Cities**. Annals of the American Association of Geographers, 109:5, 1651-1670, DOI: 10.1080/24694452.2019.1580132. 2019.

HOLLANDER, J. B. **Sunburnt Cities: The Great Recession, Depopulation and Urban Planning in the American Sunbelt.** Oxford, UK: Routledge. 2011.

JESSEN, J. Conceptualizing shrinking cities—a challenge for planning theory. In: R. Ganser and R. Piro (eds) **Parallel patterns of shrinking cities and urban growth**. Ashgate: Burlington, VT, pp. 45–58. 2012.

KAZIMIERCZAK, J.; SZAFRAŃSKA, E. **Demographic and morphological shrinkage of urban neighbourhoods in a post-socialist city: the case of Łódź**, Poland, Geografiska Annaler: Series B, Human Geography, 101:2, 138-163, DOI: 10.1080/04353684.2019.1582304. 2019.

LAURSEN, L. Shrinking cities or urban transformation. **Aalborg University Press: Aalborg**. 2009.

LAURSEN, L. Urban transformations—the dynamic relation of urban growth and decline. In: R. Ganser and R. Piro (eds) **Parallel patterns of shrinking cities and urban growth**. Ashgate: Burlington, VT, pp. 73–82. 2012.

LÓPEZ BUSTO, A.; ARELLANO RAMOS, B. Shrinkingcities. El caso aplicado de Ferrol[en línea] En: **ACE: Architecture, City and Environment** = Arquitectura, Ciudad y Entorno, 13 (38): 263-286. 2018.

MACE, A.; VOLGMANN, F. The role of Leipzig's narrative of shrinking. **Urban Geography**. 39 (11):1-19. ISSN 0272-3638 DOI: 10.1080/02723638.2017.1395612. 2017.

MOREL-DORIDAT F.; HAMEZ, G. La recherche scientifique sur les shrinking cities: apport de la bibliométrie. Cybergeo: Revue européenne de géographie**. European journal of geography**, UMR 8504 Géographie-cités, pp.902. ff10.4000/cybergeo.32354ff. ffhalshs-02476706f. 2019.

NIU, W.; XIA, H.; WANG, R.; PAN, L.; MENG, Q.; QIN, Y.; LI, R.; ZHAO, X.; BIAN, X.; ZHAO, W. Research on Large-Scale Urban Shrinkage and Expansion in the Yellow River Affected Area Using Night Light Data**. ISPRS Int. J. Geo-Inf**. 10, 5. <https://dx.doi.org/10.3390/ijgi10010005>. 2021.

OSWALT P. **Shrinking Cities, Vol. 1. International Research**. OstfildernRuit, Germany, Hatje Cantz Verlag, p. 735. 2006.

PALLAGST K. The future of shrinking cities - problems, patterns and strategies of urban transformation in a global context. **Institute of Urban and Regional Development, Center for Global Metropolitan Studies, and the Shrinking Cities International Research Network Monograph Series**, 81-88. 2009.

PALLAGST, K.; FLESCHURZ, R.; SAID, S. What drives planning in a shrinking city? Tales from two German and two American cases. **Town Plan**. Rev. 2017, 88.

RECKIEN, D.; MARTINEZ-FERNANDEZ, C. **Why do cities shrink? European Planning Studies.** 19(8), pp. 1375–1397. 2011.

REIS, J. P.; SILVA, E. A.; PINHO, P. Spatial metrics to study urban patterns in growing and shrinking cities**. Urban Geogr**. 37, 246–271. 2016.

ŠERÝ O.; SVOBODOVÁ H.; ŠILHAN Z.; SZCZYRBA Z. Shrinking of cities in the Czech Republic and its reflection on society: Case study of Karviná City. **Geographica Pannonica**. 2018.

WEAVER, R.; HOLTKAMP, C. Geographical approaches to understanding urban decline: from evolutionary theory to political economy…and back? **Geogr Compass** 9(5). 2015.

WICHOWSKA, A. Shrinking municipalities and their budgetary revenues on the example of the Warmian-Masurian Voivodeship in Poland. **Oeconomia Copernicana**, 10(3), 419–432. doi: <https://doi.org/10.24136/oc.2019.020>. 2019.