

The investigative trends on peri-urban area viewed geographic perspective and issue: a bibliometric study

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Abstract. The peri-urban area represents a transitional zone between rural and urban landscapes, characterized by a mix of village-like and city-like features in physical form, social activities, and development patterns. This article provides an overview of peri-urban landscapes from a geographic perspective, based on a bibliometric analysis of research published from 2000 to 2023. Using data from the Scopus database, the study analyzed 118 publications with 3,464 citations, identifying 2014 as the peak year with 14 publications. The United States emerged as the most influential country, contributing 26 publications and maintaining 20 international collaborations. The research highlights that peri-urban areas are dynamic spaces influenced by geographic perspectives on study areas, models, scales, landscapes, development, and transformation processes. These areas are marked by social, economic, environmental, and spatial diversity. The study emphasizes the importance of geospatial technologies in exploring sustainable development strategies and calls for an interdisciplinary approach to address global challenges such as economic growth, land use changes, and urban planning in peri-urban regions.

1 Introduction

The term "peri-urban" refers to a region where urban and rural characteristics and processes meet and interact, usually located between the city and the countryside and characterized by its transitional nature and not just the characteristics of the urban and rural areas in which it is located [1, 2]. The demarcation of peri-urban boundaries is challenging due to changing land use and regional differences [3]. This area is also former rural land bordering urban areas, which is experiencing rapid changes in the landscape, equipped with spaces that become places for expansion, both physically and functionally [4, 5]. These regions display distinct patterns of land use indicators that may fluctuate along a peri-urban gradient, including reduced housing density, augmented tree covering, consistent home size, and randomly distributed proximity to rivers [6]. Rural areas are changed to peri-urban areas due to urbanization and city expansion, causing intricate interactions between urban and rural

spaces [7]. It offers opportunities for innovation and implementation policies and projects that improve resilience and regional territorial systems [8, 9].

Peri-urban areas have a rural-urban mix and are highly dynamic in terms of spatial organization, peri-urbanization intensity, travel range, and flow concentration [10]. Diverse transformations are occurring in these regions, including changes in the composition of the terrain, economic changes, shifts in the utilization of the terrain, modifications in planning procedures, adjustments in terrain administration, and changes in the surrounding ecosystem [11]. Periurban areas are often regarded as marginal, frequently lacking inclusion in infrastructural interventions and social policies [12]. Periurban interfaces represent areas characterized by the exchange of materials, individuals, and concepts between urban and rural environments [13]. The coexistence of various land uses in peri-urban areas presents a significant planning and management challenge [14]. The examination of periurban areas encompasses spatial analyses aimed at mapping their physical, geographic, demographic, and functional characteristics, alongside socio-cultural analyses to explore local social constructs. [15].

Periurban areas, situated between urban and rural zones, exhibit complexity and multifunctionality. They are marked by low population density, dispersed settlements, significant reliance on transportation, fragmented communities, and inadequate spatial planning [16]. This system categorizes areas based on urban size, regional centrality, and urban, peri-urban, or rural dominance [17]. This typology considers land use patterns and population distribution and density to further divide regions into urban, peri-urban, and rural sub-regions [18]. The peri-urban typology categorizes the peri-urban landscape based on its characteristics and features [19]. Suburban typology refers to the classification or categorization of suburban areas based on certain characteristics and criteria including semi-urban, potential urban and predominantly urban [20, 21]. Overall, the typology of periurban areas provides a framework for studying and addressing the unique characteristics and issues associated with these transitional zones [22].

Periurban dynamics refers to changes and processes in areas experiencing rapid urban growth, leading to transformation of land use and development of transport infrastructure [23]. These regions undergo swift expansion of developed areas and arbitrary land-use changes, resulting in modifications to their structure and considerable effects on the socioeconomic and environmental fabric of the territories [24]. These regions hold strategic importance for social, economic, spatial, and environmental factors, with their unique attributes comprising transition, dynamism, and instability. [25].

The study of periurban areas involves understanding the impact of land use, hydrographic networks, and environmental features on water flow paths [26]. Periurban agriculture is highlighted as a persisting activity within these areas, which requires research from economic and rural geography perspectives [27]. Periurban landscapes are a global phenomenon that has challenged traditional ideas of city and country, leading to a paradigm shift in their study [28]. The definition and analysis of periurban areas can be complex due to the variety of territorial contexts, but spatial statistics and point pattern analysis can help provide more precise rules for describing these areas [29]. The relationship between periurban development and geography is also evident in the study of sustainable development and urban evolution, where transport infrastructure plays a key role [30].

Peri-urban is closely related to a geographical perspective, especially studying the transition zone between urban and rural areas influenced by human activity and urbanization, resulting in changes to the landscape and ecosystem [31]. Spatial-ecological approaches are used to determine peri-urban regions, considering factors such as built-up area, road density, distance from the city, and population density [32]. This approach helps identify peri-urban areas and their characteristics, such as the width of the peri-urban zone and the direction of urban sprawl [33, 34].

Peri-urban areas have been a subject of geographic research for a long time [35, 36]. Geographers have studied suburban areas to understand their distinctive characteristics, such as their transitional nature, dynamics, and instability and to explore the relationships between suburban areas and various factors, including agriculture, biodiversity, water, landscape, and social and economic development [36]. Created a method for determining suburban boundaries based on land use, socio-economic factors, and politics [37]. Understanding the spatial recognition, type identification, and driving mechanisms of peri-urban areas is crucial for effective policy-making and decision-making in these regions [38]. And it focuses on understanding the processes and transformations that occur in suburban areas, especially those related to urban development and land use change [39-40].

Along with the development of suburban areas and studies in other forms of scientific disciplines, we therefore try to see what the trends in suburban areas themselves are in the discipline of geography. The aims of this article are:

- a. What are the research publication trends in peri-urban geographic perspectives and issues?
- b. What are the research citation metric and most cited research in peri-urban geographic perspectives and issues?
- c. What is the geographical distribution of publications and cooperation patterns between countries from peri-urban geographic perspectives and issues?
- d. What is the form of a document research area in peri-urban geographic perspectives and issues?
- e. What is the focus of research on peri-urban geographic perspectives and issues?

2 Method

This research adopts a bibliometric analysis methodology that encompasses science and performance mapping. Science mapping elucidates the structure and dynamics of the subject, whereas performance analysis quantifies production and impact based on publication and citation metrics. The analyses conducted encompass citation and co-citation analysis, bibliographic coupling, and keyword co-occurrence analysis. The process of refining the collected data involves multiple steps: identification, followed by screening, eligibility assessment, and inclusion. Possesses many objectives to facilitate the identification of national and international networks, chart advancements in emerging scientific and technological domains, and evaluate the research outcomes of individuals, collectives, organizations, and nations [41]. It also helps in mapping relationships between concepts, research directions, state of the art knowledge, identifying research gaps, and providing insights for future research [42, 43].

In searching for data related to "peri-urban areas in geographic perspectives and issues" using the Scopus database because the coverage is very broad and numerous, so action is needed both in terms of keywords, year of publication, form of publication and type of language used. The first step is the identification process, entering keywords in a search on the Scopus database which was carried out on 1 October 2023. The keywords entered are (TITLE-ABS-KEY (periurban OR peri-urban OR periurbanization OR periurbanisation OR peri-urbanization OR peri-urbanisation) AND TITLE-ABS-KEY (geography)). From here, 279 various types of documents were obtained, including articles, book chapters, reviews, books, conference papers and erratums. The second step is a screening process to be selected according to the required criteria, namely in the form of articles in English and published in journals published from 2000 to 2023 using keywords (TITLE-ABS-KEY (periurban OR peri-urban OR periurbanization OR periurbanisation OR peri-urbanization OR peri-urbanisation) AND TITLE-ABS-KEY (geography)) AND (LIMIT-TO (SRCTYPE , "j")) AND (LIMIT-TO (DOCTYPE , "ar")) AND (LIMIT-TO (PUBYEAR , 2000) OR

LIMIT-TO (PUBYEAR , 2001) OR LIMIT-TO (PUBYEAR , 2003) OR LIMIT-TO (PUBYEAR , 2004) OR LIMIT-TO (PUBYEAR , 2005) OR LIMIT-TO (PUBYEAR , 2006) OR LIMIT-TO (PUBYEAR , 2007) OR LIMIT-TO (PUBYEAR , 2008) OR LIMIT-TO (PUBYEAR , 2009) OR LIMIT-TO (PUBYEAR , 2010) OR LIMIT-TO (PUBYEAR , 2011) OR LIMIT-TO (PUBYEAR , 2012) OR LIMIT-TO (PUBYEAR , 2013) OR LIMIT-TO (PUBYEAR , 2014) OR LIMIT-TO (PUBYEAR , 2015) OR LIMIT-TO (PUBYEAR , 2016) OR LIMIT-TO (PUBYEAR , 2017) OR LIMIT-TO (PUBYEAR , 2018) OR LIMIT-TO (PUBYEAR , 2019) OR LIMIT-TO (PUBYEAR , 2020) OR LIMIT-TO (PUBYEAR , 2021) OR LIMIT-TO (PUBYEAR , 2022) OR LIMIT-TO (PUBYEAR , 2023)) AND (LIMIT-TO (LANGUAGE , "English")) AND (LIMIT-TO (EXACTKEYWORD , "Geography") OR LIMIT-TO (EXACTKEYWORD , "Periurban Area") OR LIMIT-TO (EXACTKEYWORD , "Peri-urban") OR LIMIT-TO (EXACTKEYWORD , "Peri-urban Areas")). The third step, a manual eligibility process is carried out regarding publications that are eligible to be included in the inclusion stage using Microsoft Excel. And the fourth step, inclusion was carried out so that the 118 existing articles were deemed suitable for use, especially those related to the theme to be researched.

Publication trends and citation trends related to peri-urban areas in geographic perspectives and issues from 2000 to 2023 using several software as tools. The number of publications each year is displayed in a diagram with the help of Microsoft Excel. Publish or Perish software is used to make it easier to calculate citation metrics from publications and also to see the highest number of citations from existing publications. To view documents by subject area, Scopus analysis results are used. To see the geographic distribution and relationships between countries, use VOSviewer. And to display the research focus using VOSviewer.

3 Result and Discussion

Publications about peri-urban areas in geographic perspective and issues from 2000 to 2023 produced 118 publications that met the criteria, then bibliometric descriptive analysis was carried out. Publication trends, citation trends, distribution of countries and journals and research focus will be discussed further.

3.1 Research Publication Trends in Peri-Urban Geographic Perspectives and Issues

Publications about peri-urban areas in geographic perspective and issues from 2000 to 2023 produced 118 publications grouped by year of publication as shown in Figure 1 below:

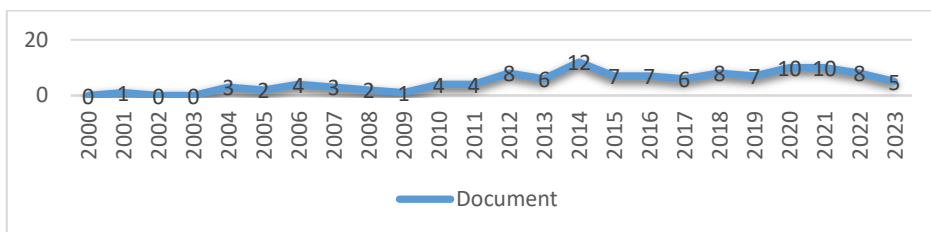


Fig. 1. Publication Trends per Year from 2000-2023

Research trends on peri-urban areas have exhibited diversity and local specificity. No universal method exists for delineating peri-urban zones, with approaches differing between developed and developing nations due to variations in land-use patterns, socioeconomic

factors, and political frameworks [44]. Publication trends in peri-urban areas have shown a focus on different geographical regions [45]. From Figure 1 it can be seen that in 2014 there were 12 articles published, this is the highest number of publications compared to other years. If you look at the trend line, it can be seen that there is an increase every year, even though the number of publications from 2000 to 2003 is not that many articles published. A rapid increase in numbers can be seen from 2010 with 4 articles published to 2014 with 12 articles published. And there has been a decrease from 2015 with 7 publications to 2023 with 5 articles published. The small number of articles published on this theme is due to the specifications in the search being interconnected between one scientific discipline and another. As well as in the geography of perspectives and issues, so the number of articles published is not too large.

3.2 Research Citation Metric and Most Cited in Peri-Urban Geographic Perspectives and Issues

Citation metrics related to peri-urban areas in geographical perspectives and issues from 2000 to 2023 produced 118 publications grouped by year of publication which were processed using Publish or Perish which will then be seen based on total publications per year which can be seen in table 1 below:

Table 1. Citation Metric From The Peri-Urban Areas In Geographic Perspective And Issues Using Publish Or Perish

Title	Citation Metric	Result
Peri-Urban Areas In Geographic Perspective And Issues	Publication years	2000-2023
	Citation years	22 (2000-2023)
	Papers	118
	Citations	3464
	Cites/year	157.45
	Cites/paper	29.36
	Cites/author	955.64
	Papers/author	44.42
	Author/papers	4.31
	h-index	33
	g-index	55
	hI,norm	16
	hI,annual	0.73
hA index	10	

The articles cited span from 2000 to 2023, with a total of 22 years of citations and 118 publications. The number of citations is 3456 in the form of Cites/year as many as 157.45, Cites/paper as many as 29.36 and Cites/author as many as 955.64. For Papers/author it was 44.42 and Author/papers it was 4.31. And the h-index value is 33, g-index is 55, hI, norm is 16, hI, annual is 0.73 and hA index is 10.

Result of processing author documents in publications regarding peri-urban areas in geographic perspectives and issues from 2000 to 2023. There are 5 authors who have been grouped using Publish or Perish with the highest number of citations, namely 227 citations and are presented in table 2 below:

Table 2. Author documents in publications

Author and Year of Publication	Year	Title	Sources	Citation
Sorensen et al.,	2015	Emerging contaminants in urban groundwater sources in Africa	Water Research	227
Tanser et al.,	2006	Modelling and understanding primary health care accessibility and utilization in rural South Africa: An exploration using a geographical information system	Social Science and Medicine	218
Okello et al.,	2006	Variation in malaria transmission intensity in seven sites throughout Uganda	American Journal of Tropical Medicine and Hygiene	216
Schmidt et al.,	2011	Population density, water supply, and the risk of dengue fever in vietnam: Cohort study and spatial analysis	PLoS Medicine	171
Kamya et al.,	2015	Malaria transmission, infection, and disease at three sites with varied transmission intensity in Uganda: Implications for malaria control	American Journal of Tropical Medicine and Hygiene	124

Of the five authors in Table 2, it can be seen that the most citations, with 227, are entitled "Emerging contaminants in urban groundwater sources in Africa," written by Sorensen. Meanwhile, the lowest from table 2 with 124 citations entitled "Malaria transmission, infection, and disease at three sites with varied transmission intensity in Uganda: Implications for malaria control" was written by Kamya. If we compare the two titles, we can find different forms in terms of problem themes. However, the main points of these two titles are in the peri-urban area and touch slightly on the geography of existing perspectives and issues.

3.3 Geographical Distribution Of Publications And Patterns Of Cooperation Between Countries On Peri-Urban Research In The Geography Of Perspectives And Issues

The geographical distribution of publications peri-urban areas in geographical perspectives and issues from 2000 to 2023 which was processed using Microsoft Excel can be seen in Figure 2 below:

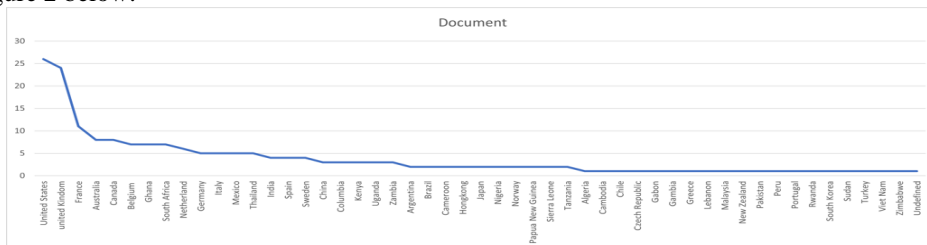


Fig. 2. Geographical Distribution Of Publications

The geographical distribution of suburban area publications in geographic perspectives and issues from 2000 to 2023 is in 51 countries. The 10 countries that publish the most include the United States (26 documents), United Kingdom (24 documents), France (11 documents), Australia (8 documents), Canada (8 documents), Belgium (7 documents), Ghana (7 documents), South Africa 7 (document), Netherland (document 6) and Germany (5 documents). Meanwhile, countries that have at least 1 document include: Algeria, Cambodia,

Chile, Czech Republic, Gabon, Gambia, Greece, Lebanon, Malaysia, New Zealand, Pakistan, Peru, Portugal, Rwanda, South Korea, Sudan, Turkey, Vietnam and Zimbabwe.

Relations between countries in this publication regarding peri-urban areas in geographical perspectives and issues from 2000 to 2023 contains 9 clusters. Collaborative relationships between countries related to publication in this case do not specify the threshold used, so that all countries will appear in different forms of relationship. The following is Figure 3 regarding relations between countries based on publications that have been processed using VOSviewer as follows:

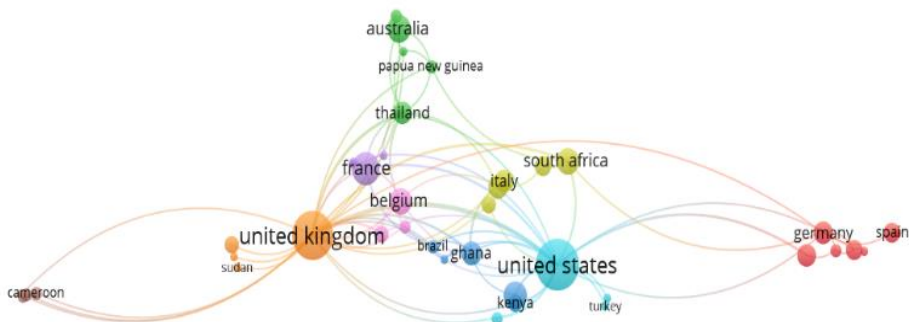


Fig. 3. Relations Between Countries in This Publication Uses VOSViewer

Of the nine clusters produced, they can be viewed one by one based on the cluster they occupy. Some of them: cluster 1 includes Argentina, Czech Republic, Germany, Mexico, Rwanda, Spain, Sweden; cluster 2 includes Australia, Hong Kong, New Zealand, Papua New Guinea, Thailand; cluster 3 includes Brazil, Canada, Gambia, Ghana, Kenya; cluster 4 includes the countries of Columbia, India, Italy, the Netherlands, South Africa; cluster 5 includes Algeria, France, Gabon, Portugal; cluster 6 includes Sierre Leone, Turkey, United States, Zimbabwe; cluster 7 includes the countries Cambodia, Sudan, United Kingdom, Zambia; cluster 8 includes Cameroon, Japan, Norway, Vietnam; and cluster 9 contains the countries Belgium, Nigeria, and Uganda.

From here, we found 2 large circular shapes, namely the United States in cluster 6 which has cooperative relations with 20 other countries, and the United Kingdom in Cluster 7, which has cooperative relations with 26 other countries. Meanwhile, the medium-sized circles in France and Australia only have 5 to 8 connections between countries. This implies that these countries have a higher level of cooperative relations compared to other countries.

3.4 Document Research Area and Research Focus on Peri-Urban Geography in Perspectives and Issues

Documents by subject area in this publication regarding peri-urban areas in geographic perspective and issues from 2000 to 2023 there are 11 documents. The following is Figure 4 regarding documents by subject area based on Scopus analysis as follows:

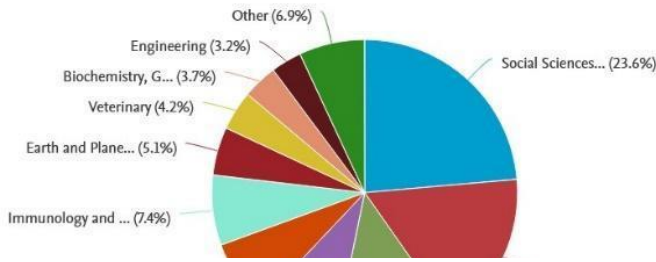


Fig. 4. Documents by subject area

If you look at the top 3 that appear most often as documents research area, they are in the fields of social science, environmental science, and medicine. Meanwhile, the lowest numbers (3 and below) are in the fields of chemistry, decision sciences and pharmacology, toxicology, and pharmaceuticals. This proves that periurban areas are the focus of research in various disciplines [46]. These areas are characterized by a combination of urban and rural features and are affected by factors such as population dynamics, poverty, and urbanization [47]. Multidisciplinary research that combines social and physical methodologies to assess environmental quality at the neighborhood level [48]. And in the field of interdisciplinary research involves the study of various dimensions of sustainability in urban areas, such as energy, transport, waste management, quality of life, and biodiversity [49].

3.5 Research Focus on Peri-Urban Geography in Perspectives and Issues

Next, the focus of the research can be seen in the relationship between existing research, the threshold for each keyword to be used is at least 2. In this case, all keywords that are more or equal to 2 are entered with the help of VOSviewer, so that the number of keywords that appear is 660. The following is an image of network visualization, overlay visualization and density. The network visualization is presented in Figure 5 below:

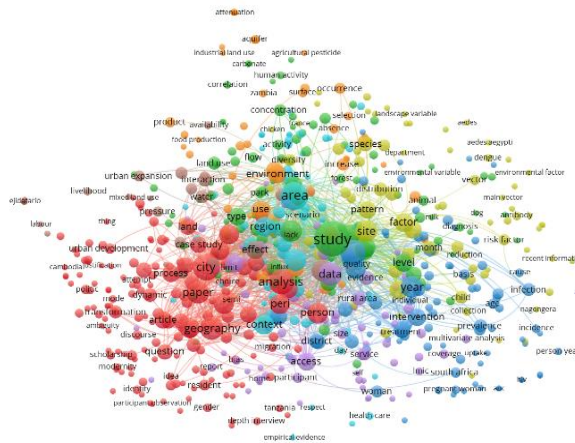


Fig. 5. Network Visualization Between Peri-Urban Areas on Geography Perspective And Issues

Here are eight different clusters based on the existing color shapes. This proves that the research theme on peri-urban areas related to geographical perspectives and issues is very broad, thus forming a unique pattern. From this pattern, we can see the relationship between one and the other. Some of the clusters include: cluster 1 is red with a total of 168 items;

cluster 2 is green with a total of 102 items; cluster 3 is blue with a total of 91 items; cluster 4 is yellow with a total of 86 items; cluster 5 is purple with a total of 73 items; and cluster 6 is light blue with a total of 60 items, cluster 7 is orange with a total of 54 items, and cluster 8 is brown with a total of 26 items.

Next, the main keywords were selected based on the aim of this article to see the relationship, namely "peri-urban" and "geography". The selection of keywords that appear as a form of seeing relationships and images in looking at the current situation and also the picture in the future The following is Figure 6, Network Visualization focuses on peri-urban area relations as well as geographical perspective and issue relations, as follows:

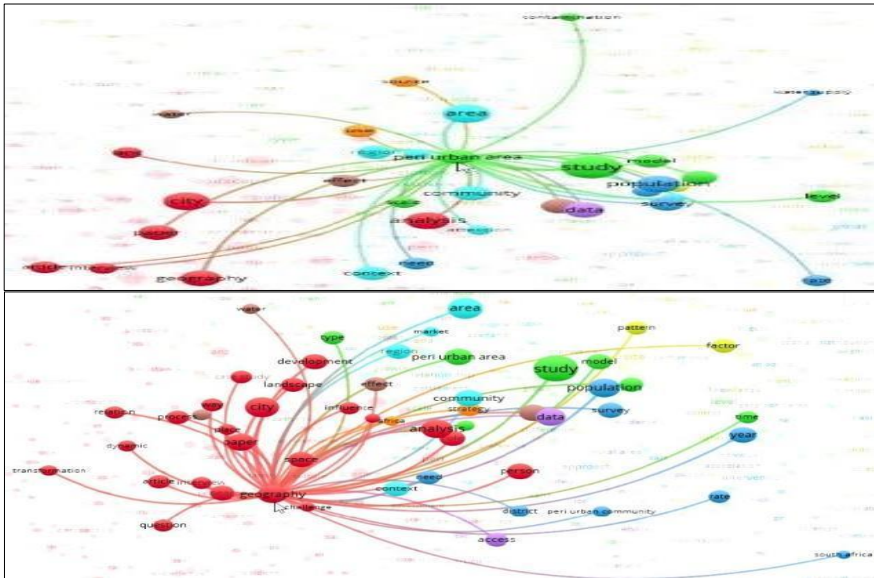


Fig. 6. Network Visualization focuses on Peri-Urban Area relations as well as geographical Perspective and Issue relations

From Figure 7, it can be seen that the peri-urban areas in cluster 2 are colored green, related to study, model, scale, level, and contamination. From here, you can see the form of connection with the others, including cluster 1 in red (geography, city, and land in the form of analysis, articles, papers, and interviews); cluster 3 in blue (population, survey, water supply, household, and need); cluster 4 in yellow (no description); cluster 5 in purple (data); cluster 6 in light blue (area, region, and community); cluster 7 in orange (source and use); and cluster 8 in brown (water and effect). Meanwhile, you can see that geography is in cluster 1 in red, which is related to space, landscape, development, transformation, relations, process, dynamic, paper, interview, and article. From here, you can also see other clusters, including cluster 2 in green (periurban area, study, model, type, and time), cluster 3 in blue (population, survey, need, year, and rate), cluster 4 in yellow (pattern and factor), cluster 5 in purple (data, access), cluster 6 in light blue (area, market, region, and community), cluster 7 in orange (strategy and Africa), and cluster 8 in brown (effect).

In the overlay visualization, you can see the trend of research years that emerged between 2012 and 2018. There were 54 publications and a total of 1623 citations. The following is the explanation: in 2012 there were 8 publications with a total of 191 citations; in 2013 there were 6 publications with a total of 202 citations; in 2014 there were 12 publications with a total of 400 citations; in 2015 there were 7 publications with a total of 450 citations; in 2016 there were 7 publications with a total of 97 citations; in 2017 there were 6 publications with a total of 102 citations; and in 2018 there were 8 publications with a total of 181 citations.

The following Figure 7 overlay visualization, peri-urban areas on geographic perspectives and issues:

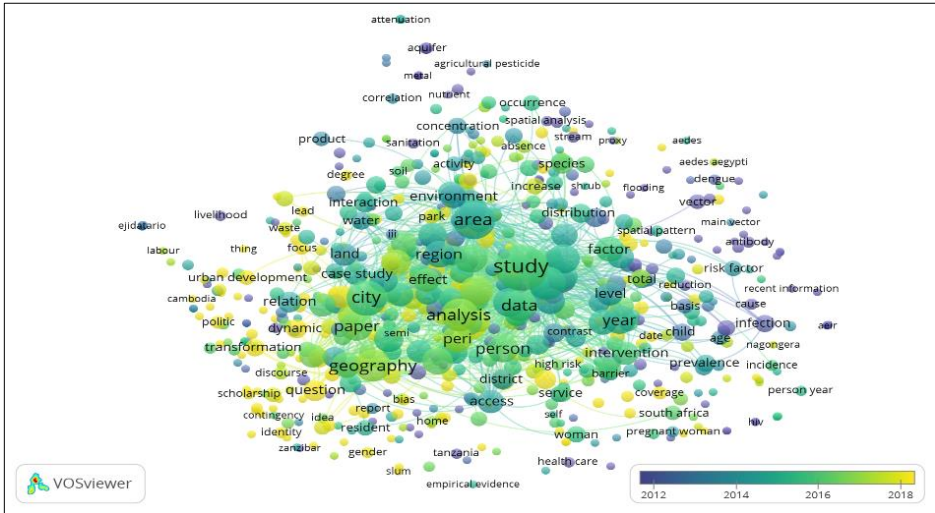


Fig. 7. Overlay Visualization of Peri-Urban Areas on Geographic Perspectives and Issues

In density visualization, you can see the level of density in peri-urban area studies from geographical perspectives and issues. This proves that the study of peri-urban areas and geography are interrelated and influence one another, especially in terms of the level of color density. The high concentration of orange color can be seen in several studies, especially peri urban areas, geography, environment, and development in the form of studies, areas, papers, data, analysis, factors, and levels. Meanwhile, the low concentration of orange indicates that there is an opportunity to carry out studies at a later stage. The following Figure 8 shows the density visualization of peri-urban areas on geographic perspectives and issues as follows:

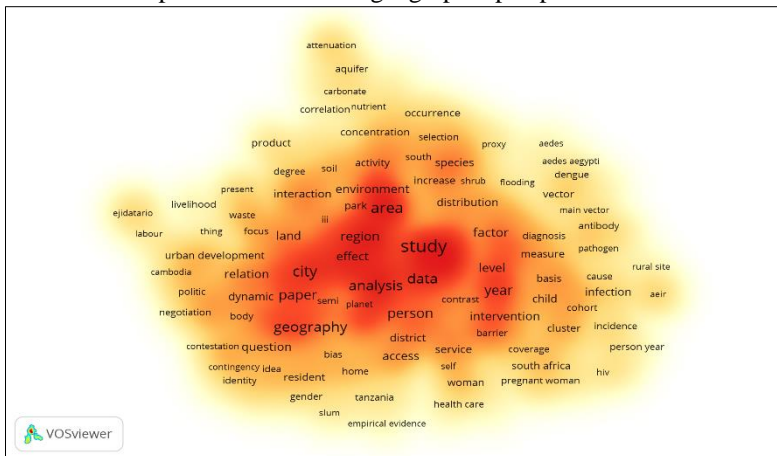


Fig. 8 Density Visualization of Peri-Urban Areas on Geographic Perspectives and Issues

The study of peri-urban areas is related to geographic and issue perspectives. This can be seen in terms of how the peri-urban area occurs, both physically and non-physically. So that the development of the issue provides characteristics and dynamics that continue to develop in terms of location and time. Here are some relationships based on existing keywords, including:

- a. Definition and concept peri-urban area

Peri-urban areas lack a globally acknowledged description and exhibit diverse characteristics. Periurban areas are commonly recognized as intermediary regions situated between urban and rural areas. There is no standardized method for demarcating peri-urban areas, as they vary geographically and depend on factors such as land-use patterns, socioeconomic drivers, and political systems [50]. Rapid urbanization, land use changes, and socio-economic shifts are evident in various regions. These changes are driven by factors such as political, economic, social, technological, and cultural forces. The expansion of urban areas and the increase in energy and water use have significant implications for land and water resources [51]. The global food system is also undergoing changes due to population growth, economic globalization, and improving living standards, leading to shifts in dietary habits and increased pressure on natural resources. These places are distinguished by swift urbanization, alterations in land use, and socio-economic shifts. Peri-urban areas undergo land use change, with farmland and natural landscapes being replaced by residential, industrial, and commercial purposes. This causes land use disputes, environmental deterioration, and biodiversity loss.

b. Relationship peri-urban area in geography perspektive and issue

Peri-urban areas are dynamic and changing regions that lie between urban and rural areas. They have gained attention in geography due to their distinctive characteristics and strategic significance in various aspects such as space, social, economic, and environmental. Periurban landscapes are a global phenomenon that has challenged traditional ideas of city and country, leading to a paradigm shift in their study. The concept of peri-urban supersedes concepts such as urban periphery, *desakota*, and city-village amalgamation. The identification and delineation of peri-urban zones fluctuate among various countries and regions owing to variations in land-use patterns, socioeconomic factors, and political structures. No universal method exists for peri-urban delineation; approaches are spatially particular. Nonetheless, a pluralistic framework is necessary to delineate peri-urban boundaries on a regional-global scale to facilitate improved policy formulation [52].

Peri-urban areas are between urban and rural areas. Rising urbanization has changed land use and coverage in these places. Since peri-urban zones' limits depend on geography and vary by country, there is no globally acknowledged method for defining and demarcating them. Urbanization can deplete biodiversity and green spaces in the peri-urban landscape, which provides ecosystem services. The impact of land use and land cover change on peri-urban areas is significant, and geospatial technology can be used to analyze and propose sustainable development strategies for these regions [53]. To understand peri-urban environments, a multidisciplinary and transdisciplinary approach that considers physical, economic, social, and human factors is needed. This technique can identify peri-urban typologies by evaluating key dimensions and indicators. This allows for more targeted planning and administration. Peri-urban areas are dynamic and require inclusive and sustainable development to meet user and stakeholder needs. This approach can help identify typologies of peri-urban areas and contribute to better planning and management strategies [54]. The definition and analysis of periurban areas can be complex due to the variety of territorial contexts, but spatial statistics and point pattern analysis can help provide more precise rules for describing these areas. The relationship between periurban development and geography is also evident in the study of sustainable development and urban evolution, where transport infrastructure plays a key role.

Peri-urban areas are the subject of substantial geographical research. These areas, situated in the periphery of urban areas, exhibit characteristics that are neither entirely urban nor rural. These issues include rapid urban growth and the transformation of land use from rural to urban areas, resulting in the development of suburban areas [55]. Peri-urban development is a global problem and involves various aspects such as economic

growth, land use change, public service provision, ecological conservation, urban planning, and social equity. These areas have been the subject of debate and research due to their unique characteristics and the diversity of the people who inhabit them. The difficulty lies in precisely identifying and demarcating these zones because they are temporary and have different interpretations. Periurban issues refer to the environmental problems faced by cities and metropolitan areas, and how these problems impact health, local ecosystems, and global cycles [56].

4 Conclusions

This article aims to provide an overview of the landscape resulting from previous research in the form of peri-urban areas from a geographic perspective and issue. Research article publications from 2000 to 2023 were obtained from the Scopus database, with a total of 118 publications. Several software programs are used as tools to process data, including Microsoft Excel, Publish or Perish, and Vosviewer.

The results of the investigation using bibliometric analysis, the publication trend per year shows that 2014 had the highest number of articles, namely 12 articles published. The trend shows an increase every year, increasing rapidly from 2010 to 2014 but decreasing from 2015 to 2023. Research Citation Metrics shows that with a total of 22 years of citations, the number of citations is 3456 in the form of Cites/year of 157.45, Cites/paper of 29.36, Cites/author of 955.64, Paper/author of 44.42, Author/paper of 4.31, h value -index of 33, g-index of 55, hI, norm of 16, hI, Annual of 0.73, and hA index of 10. The geographical distribution of publications is in 51 countries; the United States is the country that publishes the most, with 26 documents. The geographical distribution of publications is in 51 countries; the United States is the country that has published the most with 26 documents, and patterns of cooperation between countries are in cluster 6, which has cooperative relations with 20 other countries. Document research areas appear most often as document research areas; they are in the fields of social science, environmental science, and medicine. And the research focus, in this case, peri-urban areas, is closely related to geographical perspectives and problems in the field of study in the form of studies, models, scales, levels, landscapes, developments, transformations, relationships, processes, and dynamics.

Between urban and rural areas, peri-urban areas are dynamic places with distinct features and strategic importance in terms of social, economic, environmental, and spatial dimensions. They have put old notions of country and city to the test, which has changed the way people think about geography. Different countries and regions have different methods for identifying and delineating peri-urban zones because of differences in political systems, land-use patterns, and socioeconomic factors. Although there isn't a widely accepted process for identifying and dividing these regions, sustainable development methods can be examined and suggested using geospatial technologies. Peri-urban landscapes require an interdisciplinary approach that takes into account social, economic, physical, and human elements in order to improve planning and management techniques. Global issues like economic expansion, changing land uses, public service delivery, environmental preservation, urban planning, and social justice are all involved in peri-urban development.

The limitations in this writing are: 1) the data used for analysis comes from the Scopus database, so there are many other databases that can be used; 2) this article only discusses suburban areas from a geographical aspect, so it is very difficult to find specific perspectives and problems; 3) the data in this article, which was taken on October 1, 2023, cannot reflect subsequent research, so there may be slight differences.

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