




## Research Trends in Environmental Sociology: A Bibliometric Analysis of Scientific Publications from 1976 to 2024

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### ABSTRACT

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Environmental sociology has become an increasingly important field of study in addressing various global environmental challenges. Given the crucial role of this discipline in understanding the interaction between society and the environment, it is essential to examine the development and current research trends in environmental sociology. This article presents a bibliometric review of the development of environmental sociology research from 1976 to 2024. By analyzing 474 articles authored by 664 scholars across 189 journals, we trace the field's evolution from early concerns with environmental consciousness and ecological disparities to contemporary engagement with pressing issues like climate change, environmental justice, and the Anthropocene. Our findings reveal a field in ascent, with a surge in publications led by the United States, the United Kingdom, and Sweden. However, challenges remain, including the need for more interdisciplinary collaboration to tackle the growing complexity of environmental problems. Looking ahead, we identify promising avenues for future inquiry, from unraveling the social dimensions of climate adaptation to confronting environmental inequities and strengthening the field's theoretical and methodological foundations. Through this bibliometric lens, we aim to sharpen our understanding of environmental sociology's past, present, and future and to inspire the next wave of scholarship on the intricate dance between society and nature in an era of profound global change.

## 1. INTRODUCTION

Environmental problems are no longer limited to being issues of industry, technology, ecology, and biology; they have also evolved into social problems. Various disciplines have studied the environment, including sociology, politics, management, and anthropology [1]. In general, the increase and institutionalization of environmental sociology began in 1976 in the United States, which is now referred to as the Section on Environmental Sociology [2]. Environmental sociology has rapidly developed after moderate growth in its first two decades [1, 3]. In light of the ever-evolving intricacies and the mounting urgency surrounding ecological issues on a global scale, it is imperative that we take a closer look at the trajectory and present landscape of sociological research focused on the environment. Understanding the trends, contributions, and dynamics within this field can provide valuable insights for addressing pressing environmental issues and shaping future research directions.

Environmental sociology seeks to provide the best ways to conceptualize and grasp the intricate interplay and mutual influence that the natural world and human civilization exert upon each other [3]. In its application, environmental sociology adapts sociological concepts such as habitus, individualization, social movements, governance, co-production, and risk to fit the characteristics of the

environment [3]. Despite its development, environmental sociology is not immune to criticism. One of the obstacles faced by the founders of environmental sociology is dealing with human emancipation [4, 5]. In addition, the development of thinking that sees the environment not as the core but only as a conceptual part of the social environment. Nevertheless, environmental sociology is presently advancing expansively and confidently, going beyond the main debates that characterized the discipline in the late twentieth and early twenty-first centuries [6].

Researchers face contemporary problems, including those related to a more comprehensive global view of the types of socio-environmental problems affecting an ever-increasing proportion of humanity, connecting to other disciplines and sub-disciplines, discovering and recognizing the relevance of emerging socio-ecological configurations and processes in new research, and engaging creatively with the ideas and realities of the Anthropocene. Based on publication trends, bibliometric literature discussing environmental issues through the discipline of environmental sociology has been published, but the number is limited. In the past, environmental challenges like air and water pollution were easily discernible to the naked eye. However, the newer breed of issues, ranging from toxic waste and ozone layer depletion to climate change, demands a different approach. Scientists now must rely on precise measurements and meticulous data

interpretation to identify the existence of these threats, analyze the extent of their impact, and formulate potential solutions. The reliance of environmental advocates on scientific findings has ultimately piqued the interest of sociologists, who seek to further scrutinize the dynamics at play [3, 7].

Based on our literature review, several previous bibliometric studies have investigated various aspects related to the environment and sustainability, such as the analysis of scientific production in the field of research skills of the environmental approach from 2000 to 2022 [8], a bibliometric analysis of sustainability papers from the journal *Environment, Development and Sustainability* [9], a bibliometric analysis of urban environment quality studies based on satellite remote sensing data [10], three decades of sustainability strategy publications from a bibliometric perspective [11], the influence of sustainability reports on social and environmental issues using bibliometric analysis and the word cloud approach [12], an interdisciplinary review of environmental finance [13], and global trends in green business research through bibliometric analysis [14]. However, these studies have not specifically examined the development and research trends in the field of environmental sociology. Considering the crucial role of environmental sociology in understanding the interaction between society and the environment and addressing various global environmental challenges, it is important to comprehensively examine the development, contributions, and dynamics of research in this discipline. Therefore, a bibliometric study focusing on the development of environmental sociology research will provide valuable insights into trends, key issues, and future directions of research in this field.

Bibliometric analysis serves two primary purposes: First, it provides a quantitative assessment of the quality of journals or authors using statistical indicators [15]; second, it allows for a deep dive into the structure of knowledge and the evolution of specific research fields [16]. With these goals in mind, our study embarks on an exploration of several key aspects that we believe will be of particular interest to scholars and professionals dedicated to the study of sociology and, more specifically, environmental sociology. We begin by examining the trends in research publications on current environmental issues within the sociological realm. This is followed by an investigation into the emerging research topics that are gaining traction in this field. We then shift our focus to identifying the most influential and productive institutions, authors, journals, and countries that are driving the conversation forward. Finally, we aim to uncover potential areas for future research in the field of environmental sociology, illuminating the path ahead for scholars looking to make their mark in this critical domain.

## 2. METHOD

### 2.1 Data collection

The primary aim of this study is to investigate scholarly patterns and delve into ecological matters within sociological inquiries. Due to its preciseness in quantifying and assessing academic literature, bibliometric examination is employed [17]. Furthermore, data is collected from the Scopus database. Various papers have confirmed that Scopus provides more comprehensive overall coverage and indexes more unique sources not covered by WoS, and it also supports quality bibliometric analysis [18, 19]. Scopus is a popular tool among

academics for accessing literature for high-quality analytical insights [20].

In the next stage, search strings are determined for all documents based on titles, abstracts, and keywords containing the terms "environmental sociology" and "socio-environmental studies." These main keywords are highly representative of achieving the objectives because they are not too broad and are sufficiently specific. The primary goal is to study environmental issues in sociological research. The keywords "environmental sociology" and "socio-environmental studies" have a significant impact because they can be used to obtain sufficient relevant literature data for further analysis.

The search using the keywords included in TITLE-ABS-KEY ("environmental sociology" OR "socio-environmental studies") was conducted on August 5, 2024. The publication timeframe was not limited during the search to determine the initial emergence of publications on environmental sociology up to the present year, 2024. To ensure a focused scope, the analysis included only works written in English, such as completed articles, papers in their final publication stage, and specific categories of journal sources. The initial search yielded 873 documents published from 1976 to 2024. Subsequently, several inclusion criteria were applied to filter the search results to align with the scope and objectives of the study. First, the document types were filtered to include only journal articles (j type=ar) and reviews (document type=re), excluding other document types such as conference papers, book chapters, and editorials, resulting in 525 documents. Second, only English-language documents were included to ensure accessibility and comparability of the analysis. Thus, 399 documents were excluded, yielding 474 documents for further analysis. This screening process ensured that the final dataset consisted of the most relevant, high-quality, peer-reviewed literature pertaining to the research topic. Finally, 474 articles were obtained and considered sufficient for further analysis. The flowchart of the data collection technique is presented in Figure 1.

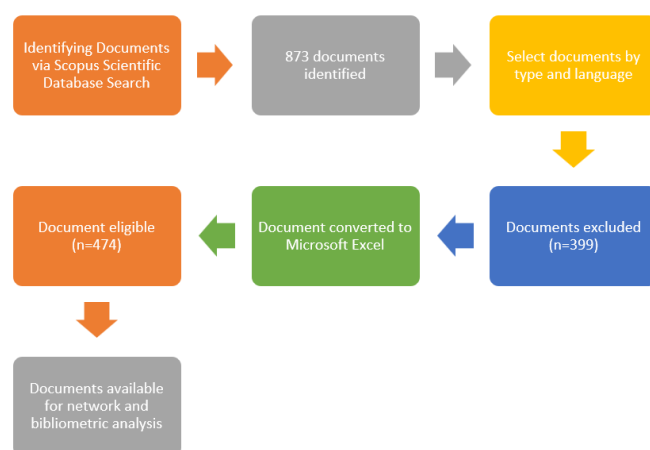


Figure 1. Search strategy for bibliometric analysis

### 2.2 Data analysis

Three applications were used to analyze the collected article data. The purpose is to validate the accuracy of the data and assist in visualizing research networks to interpret the relationships between emerging nodes. OpenRefine (v. 3.6.1) was employed to manually reduce data or combine words with similar or identical meanings. Additionally, VOSviewer (v.

1.6.15.0) was used to present bibliometric graphical mapping and visualize research networks using the most frequently contributing and interconnected terms, countries, affiliations, and journals in environmental sociology studies, as done by Zhong and Lin [21]. Furthermore, RStudio (v. 4.2.1) was utilized to create global map data visualizations to understand the geographical distribution of the articles.

3. RESULTS AND ANALYSIS

3.1 Description of retrieved literature

This study was limited to publications on environmental research in the field of sociology but was not restricted by publication year. The aim was to observe the trends in environmental sociology research from when it began to flourish until the present year, 2024. Ultimately, this study obtained 474 articles from the Scopus database, sourced from 189 journals and 664 authors. Although the search was limited to English-language articles, there were also three bilingual articles in French (1 article), Hungarian (1 article), and Lithuanian (1 article). These articles had an average citation count of 47.24. General information about the articles is presented in Table 1.

Table 1. Environmental sociology research overview

Description	Results
Document time range	1976-2024
Sources (journals)	189
Documents	474
Average authors per paper	2.53
Authors	664
Average citations per paper	47.24

3.2 Trends in the number of publications

Figure 2 displays the trend in environmental sociology

research publications based on the number of publications and the year of publication. The study of environmental sociology worldwide began in 1976 and continues to develop to the present day. The trend shows that during the early stages of environmental sociology's development, publications were very limited, with articles not being published every year but rather having gaps of one to three years between publications. The number of publications increased significantly between 2018 and 2021, contributing approximately 54.9% of the total 474 articles. This increase peaked in 2021 with around 36 articles, accounting for 20.5% of the total publications. This increasing trend in the number of publications can be linked to the growing attention towards environmental issues and the role of social factors in understanding and addressing these problems. Environmental sociology provides an important framework for analyzing the interactions between society and the environment [3].

The data on the number of articles published per year about environmental sociology from 1976 to 2024 reveals several interesting trends. Over this 48-year period, the average number of articles published annually was approximately 11-12, but there was significant variation from year to year. Publication output was very low from 1976 through the early 1990s, with 6 or fewer articles per year and none at all in some years. However, the mid-1990s marked the beginning of an upward trend, with article counts regularly climbing into the double digits in the 2000s. Between 2011 and 2021, output reached a consistently higher level, with over 20 articles published per year in most years during this range and a peak of 36 articles in 2020. The wide gap between the minimum of 0 articles (in 10 different years) and the maximum of 36 articles (in 2020), along with a high standard deviation of 10.6 articles relative to the mean of 11.5, underscores how much publication activity varied over this timespan. In summary, while the overall average is 11-12 articles per year, environmental sociology appears to have emerged as a more active research field in the 1990s and has seen substantially higher publication rates since 2011 compared to the early decades.

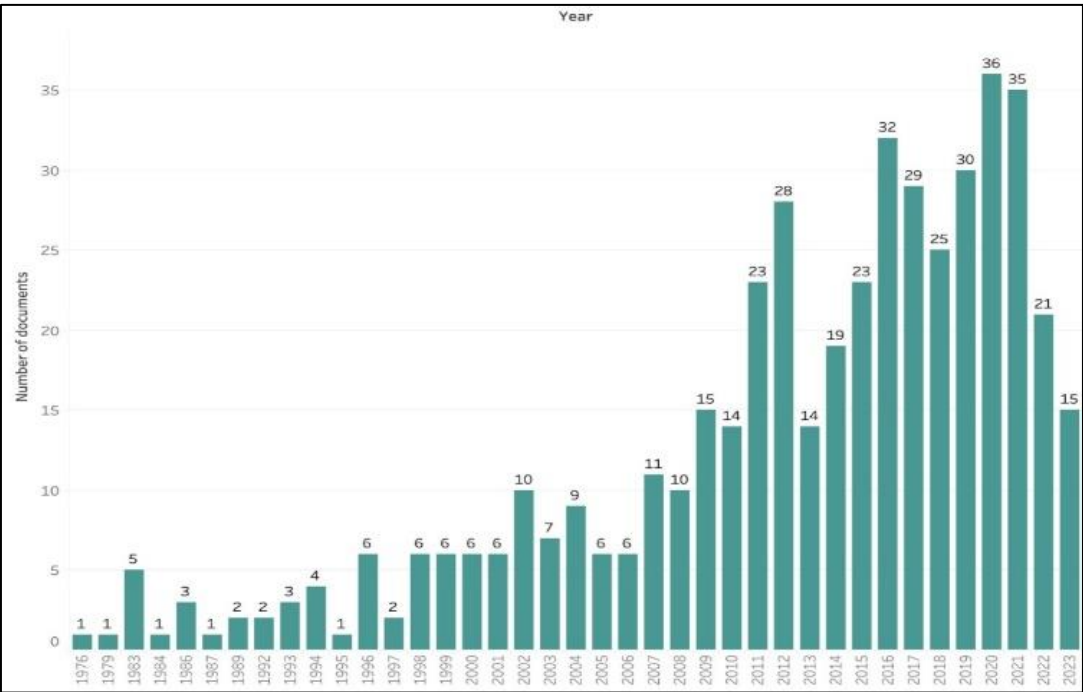


Figure 2. Number of publications by year

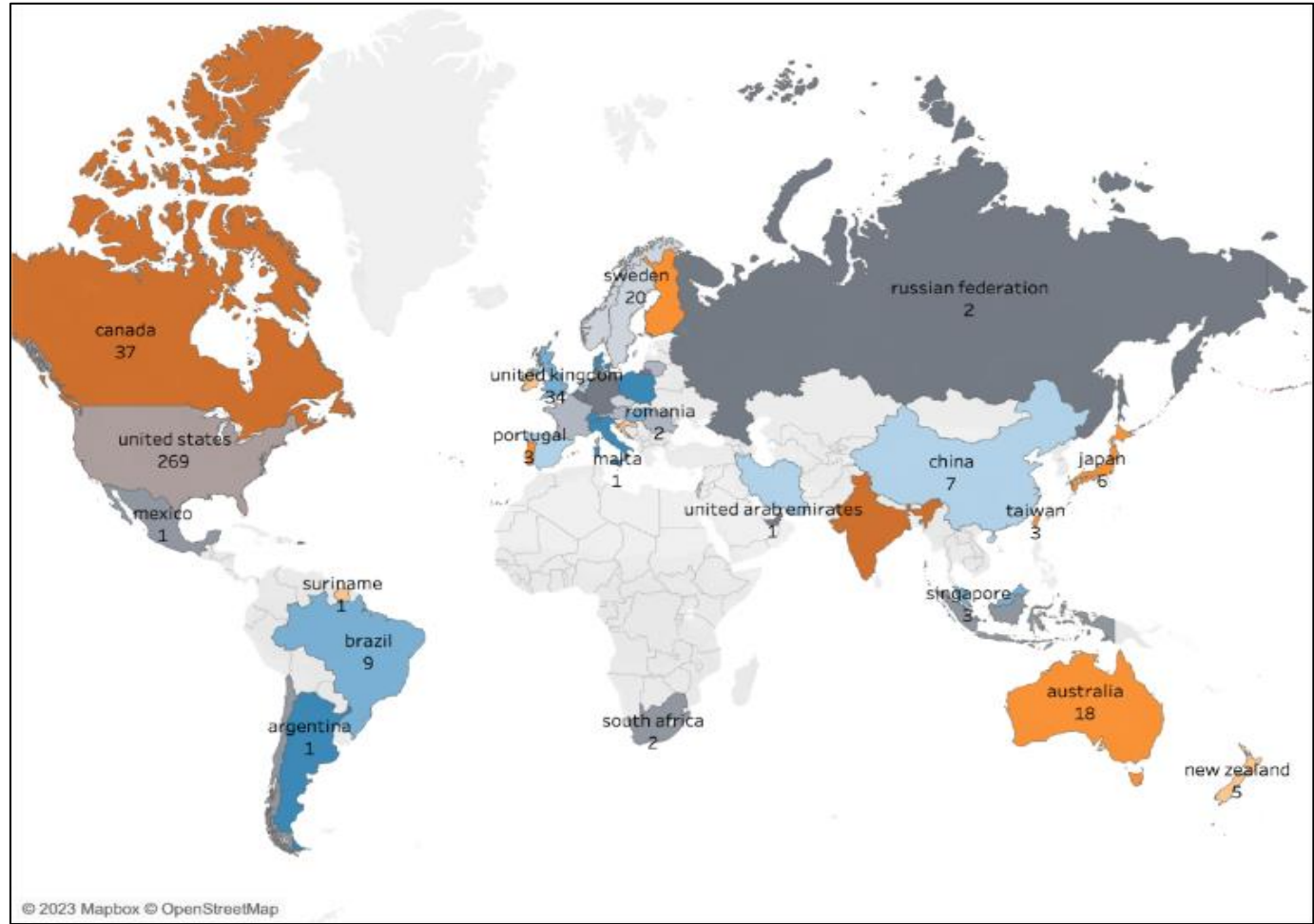
The annual growth rate of 23.76% indicates a consistent interest in environmental sociology research over time. These trends have grown and expanded in the field of environmental sociology in recent decades, transcending the major debates that characterized the discipline in the late 20th and early 21st centuries [6]. The heightened emphasis on matters like environmental justice, climate change, and the Anthropocene further propels advances in this area of study [3, 22]. This trajectory is anticipated to persist as the pressing need to comprehend and tackle intricate environmental issues through extensive sociological methods continues to intensify.

### 3.3 Contributions of various countries

The countries with the most scientific publications related to environmental sociology research can be seen in Figure 3. It is apparent that various countries have contributed to environmental sociology research publications globally. Based on the map, the United States ranks first with 37 publications, followed by the United Kingdom (26), Sweden (20), Russia (2), and Japan (6). Other countries contributing to

environmental sociology research include Canada, Mexico, Brazil, Argentina, Portugal, France, Italy, China, Taiwan, Singapore, South Africa, Australia, and New Zealand. This demonstrates that environmental sociology research has gained global attention, with contributions from diverse countries worldwide [3, 6, 23].

Although the United States and the United Kingdom dominate in terms of the number of publications, other countries also make significant contributions to the development of environmental sociology. For example, Sweden has long been recognized as a strong center for environmental research, focusing on issues such as sustainability, environmental justice, and environmental governance [24]. Japan has also contributed to environmental sociology research, particularly in the context of natural disasters and their impact on society [25]. Meanwhile, developing countries like Brazil and South Africa are increasingly involved in environmental sociology research, focusing on issues such as environmental justice, resource conflicts, and the impact of climate change on vulnerable communities [26, 27].



**Figure 3.** Top countries' environmental research

### 3.4 Analyze the research topic

In this part, bibliometric techniques are employed to showcase findings from the literature by examining commonly used keywords. The use of this analysis helps to identify topics that have been frequently explored for almost half a century (1976-2024). As such, this study maps the bibliometric analysis with different visualizations. For the emerging trends

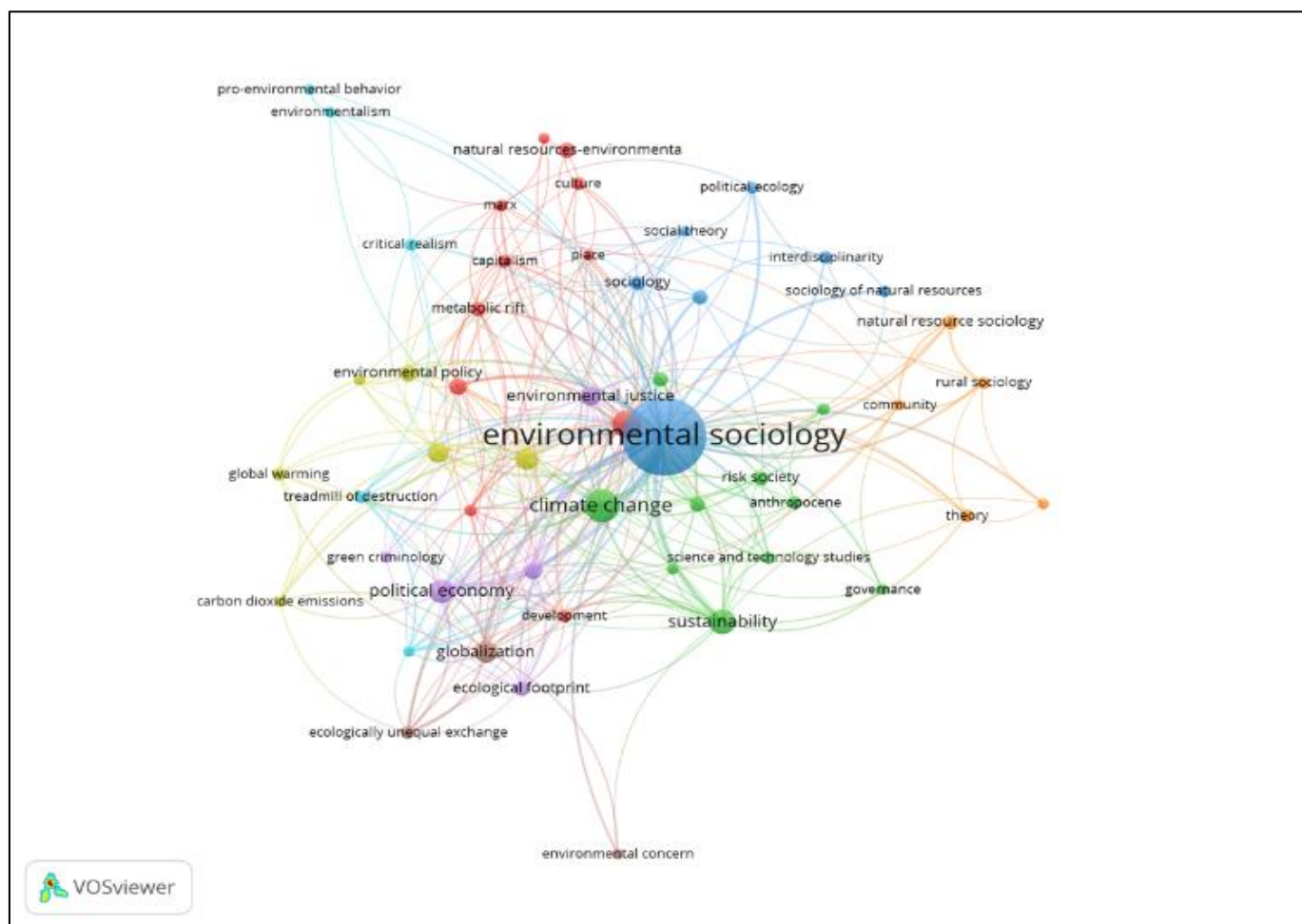
in environmental sociology research topics, data network visualization is employed using VOSviewer, which provides cluster analysis to show the interconnectedness between topics.

Figure 4 shows the visualization of the keyword network related to environmental sociology research. In this visualization, several interconnected keyword clusters are visible, illustrating the themes and topics that frequently



appear in scientific publications in this field. The prominent keyword clusters include "environmental sociology," which is closely connected to "climate change," "sustainability," "risk society," and "anthropocene." Additionally, there are other keyword clusters such as "environmental justice," which is associated with "political ecology" and "environmental policy," and "natural resource management," which is linked

to "natural resource sociology" and "political ecology" [3-6], [23-25]. In general, as shown in Figure 4, the keywords most frequently used by researchers to date are environmental sociology, sustainability, climate change, United States, and political economy, with 239, 40, 47, 26, and 31 occurrences and total link strengths of 600, 141, 133, 117, and 110, respectively.



**Figure 4.** Keyword publication clusters

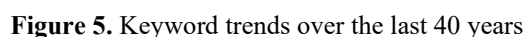
The interconnected nature of these keyword clusters underscores the multifaceted and interdisciplinary character of environmental sociology research. Themes like climate change, sustainability, risk society, and the Anthropocene are often interwoven, highlighting humanity's profound impact on the global environment [3, 5]. Similarly, studies on environmental justice frequently grapple with the unequal distribution of environmental risks and benefits while also examining the role of politics and policies in addressing these disparities [4, 23]. Meanwhile, research on natural resource management often employs a political ecology lens, delving into the power dynamics and conflicts that shape resource use and conservation [24]. Thus, this keyword network visualization provides a comprehensive overview of the diversity and interconnectedness of themes in contemporary environmental sociology research.

In addition to the interconnectedness between keyword clusters, it is also necessary to examine the trends in emerging keywords. Figure 5 shows the keyword trends in environmental sociology research over the last 40 years, from 2008 to 2018. In this visualization, it is apparent that several keywords such as "environmental concern," "ecological

unequal exchange," "ecological footprint," "globalization," "political economy," and "carbon dioxide emission" appeared in the early years of this period. These keywords reflect the research focus on issues such as environmental awareness, global ecological inequality, ecological footprint, globalization, political economy, and carbon dioxide emissions [28-31]. Over time, new keywords emerged, such as "climate change," "Anthropocene," "risk society," "sustainability," and "environmental justice," indicating a shift in research focus towards climate change, the role of humans in transforming the global environment, risk society, sustainability, and environmental justice [3, 5, 23, 32].

These keyword trends illustrate the evolution and diversification of environmental sociology research in response to emerging environmental issues. For instance, the emergence of the keyword "Anthropocene" reflects the growing recognition of the dominant role of humans in altering the Earth system, as well as the social and political implications of this phenomenon [3, 33]. Meanwhile, keywords such as "environmental justice" and "sustainability" indicate the increasing attention paid to the dimensions of justice and sustainability in the relationship between society

to evolve and adapt in response to complex and dynamic environmental challenges.



"Sociological Forum" [5, 6, 23, 31]. Additionally, researchers from other countries, such as Sweden, Canada, the United Kingdom, the Netherlands, Germany, Australia, Italy, Malaysia, and India, also contribute to environmental sociology research, with affiliations like Wageningen University, the University of Alberta, and the University of East Anglia prominently featured in this network. A summary of the ten authors with the most affiliations, countries, and sources contributing to the study of environmental sociology can be seen in Table 2.

SCR	Authors	Documents	TC	Institutions	Country
1st	Jorgenson, A.K.	27	389	University of Oregon	United States
2nd	Clark, B.	15	236	The University of Utah	Canada
3rd	Longo, S.B.	11	39	NC State University	United Kingdom
4th	Buttel, F.H.	9	36	Washington State University Pullman	Sweden
5th	Davidson, D.J.	8	19	University of Wisconsin-Madison	Australia
6th	Givens, J.E.	8	17	University of Alberta	Germany
7th	Gunderson, R.	8	16	Boston College	Netherlands
8th	York, R.	8	12	Wageningen University & Research	Brazil
9th	Clement, M.T.	6	10	Cornell University	China
10th	Dunlap, R.E.	6	7	Utah State University	Italy

on a global scale. Leading universities in the United States appear to be central to this network, with many researchers

from various countries connected to them through publications in major journals [3, 33]. However, the contributions of researchers from other countries are also becoming increasingly significant, reflecting the growth and internationalization of environmental sociology research [4,

24]. This correlation analysis provides insights into the patterns of collaboration and knowledge dissemination within the global environmental sociology research community, as well as the important role of certain universities and journals in advancing the field.

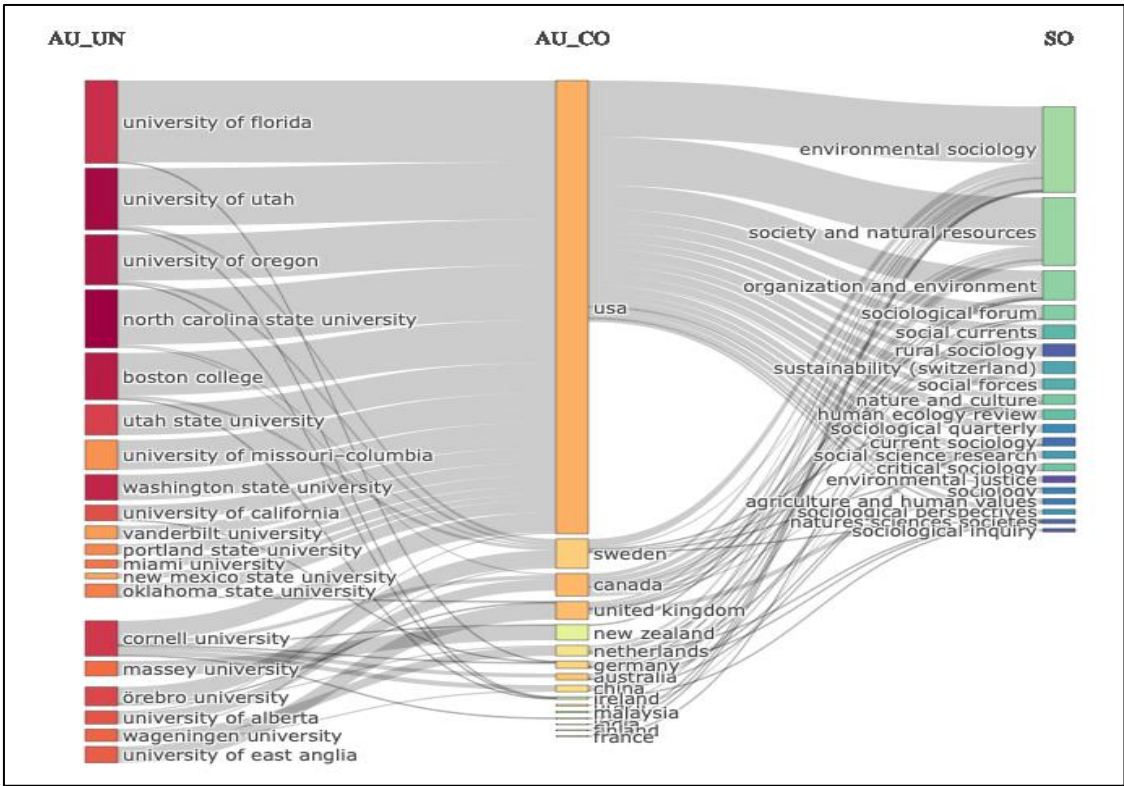


Figure 6. Three field plot analysis

### 3.6 The most prolific author

In analyzing the development of environmental sociology research, one important aspect to consider is the productivity of researchers over time. Figure 7 shows the publication output of several prominent researchers in the field of environmental sociology from 1982 to 2023.

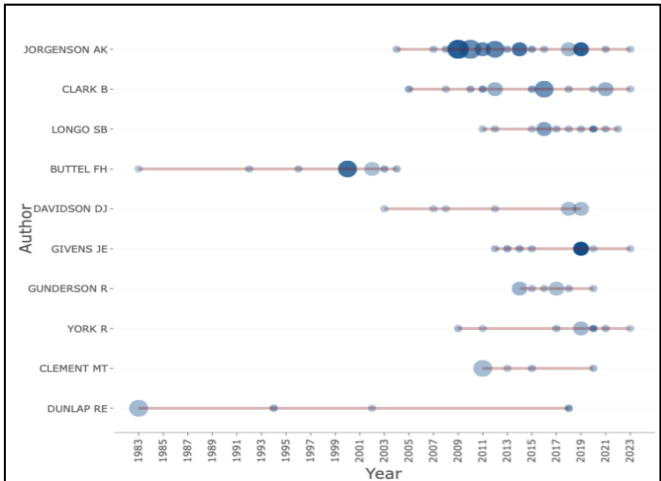


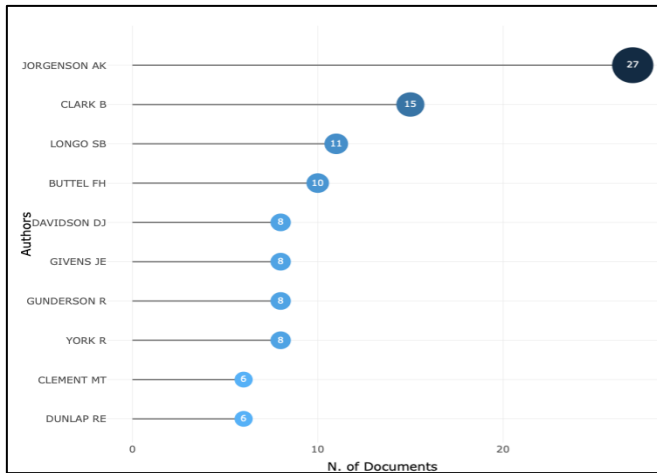
Figure 7. Authors' production over time

Based on the information presented in Figure 7, it is apparent that certain scholars, including Jorgenson AK, Clark B, Longo SB, Buttel FH, and Davidson DJ, have consistently

contributed significant research over an extended timeframe. To illustrate, Jorgenson AK has been prolific in publishing numerous papers from the early 2000s onwards, addressing critical topics such as the environmental consequences of globalization, the link between economic development and ecological deterioration, and disparities in ecological burdens [29, 35, 36]. Meanwhile, Clark B also has a solid publication record, often collaborating with Jorgenson to investigate similar topics [37, 38]. Other researchers, such as Longo SB, Buttel FH, and Davidson DJ, have also made significant contributions over different time periods, focusing on issues such as environmental justice, ecological modernization, and environmental governance [39-41].

The ever-evolving nature of environmental sociology research is mirrored in the shifting productivity of its scholars, who continually adapt their focus to address the most pressing ecological challenges of the day. Some researchers, such as Dunlap and York R, have made important contributions to developing the theoretical and conceptual foundations of environmental sociology, particularly in terms of the environment-centered paradigm [31, 42, 43]. Other researchers, such as Clement MT and Gunderson R, have contributed to investigating more specific issues, such as environmental social movements and the relationship between capitalism and environmental crises [44, 45]. The ebb and flow of researcher output across the years offer a window into the rich tapestry of environmental sociology, highlighting the field's transformative journey and the vital contributions of dedicated scholars in unraveling the complex interplay between human society and the natural world.





**Figure 8.** Most relevant authors

In addition to analyzing researcher productivity over time, it is also important to identify the most relevant researchers in the field of environmental sociology. Figure 8 shows the number of documents published by several prominent researchers in this aspect.

Based on the data shown in Figure 8, Jorgenson emerges as the most prominent scholar, having authored 27 publications. Clark B follows with 15 papers, while Longo has contributed 11 works. Notably, Jorgenson's research has significantly advanced our understanding of critical issues such as globalization's environmental consequences, disparities in ecological burdens, and the complex interplay between economic growth and ecological deterioration [29, 35, 36]. Clark, who often collaborates with Jorgenson, has also investigated similar topics, focusing on carbon metabolism and the biospheric rift in global capitalism [37, 38]. Meanwhile, Longo has contributed to research on environmental justice, political ecology, and the relationship between the economy and the environment [39, 46].

Buttel, Davidson, Givens, Gunderson, York, Clement, and Dunlap are among the other notable scholars who have left an indelible mark on the field of environmental sociology. As one of the trailblazers behind ecological modernization theory, Buttel's work has shaped the discourse around society's response to environmental challenges [40]. Davidson, meanwhile, has delved into the intricacies of ecological modernization and environmental governance [41]. Givens and Gunderson have shed light on the dynamics of environmental social movements, environmental justice, and the complex interplay between capitalism and ecological crises [45, 47]. York and Dunlap, as previously noted, have played a pivotal role in laying the theoretical and conceptual foundations upon which contemporary environmental sociology is built [31, 43]. Their collective contributions have deepened our comprehension of the intricate connections between human communities and the ecosystems they inhabit. By offering groundbreaking perspectives and thought-provoking insights, these scholars have played a pivotal role in advancing the field and shaping its trajectory.

### 3.7 Limitations of existing research

Based on the analysis of topic trends and researcher contributions in environmental sociology, it is evident that research thus far has covered various important themes such as climate change, environmental justice, sustainability, risk

society, and the Anthropocene. Although these topics provide valuable insights into the interaction between society and the environment, there are still some limitations in the scope and emphasis of the research. First, while global issues such as climate change and the Anthropocene have received significant attention, environmental sociology research tends to pay less attention to specific local and regional contexts, where the impacts of environmental change are often felt most acutely. A more nuanced understanding of how societies in different regions and cultures navigate and adapt to environmental challenges can enrich the insights and solutions offered by this discipline.

Another limitation in environmental sociology research topics is the lack of integration with perspectives and approaches from other disciplines. Although environmental sociology has adopted concepts from political ecology and political economy, there is still room for greater collaboration with fields such as anthropology, environmental psychology, and sustainability science. Given the multidimensional nature of environmental challenges, stronger interdisciplinary and transdisciplinary approaches can help generate more holistic understandings and more effective solutions. Moreover, future environmental sociology research needs to pay greater attention to the role of factors such as inequality, justice, and power dynamics in shaping environmental and social outcomes, as well as the implications of evolving environmental crises for marginalized and vulnerable populations.

### 3.8 Potential topics for future studies in environmental sociology research

The growing body of research indicates that environmental sociology is a highly promising and valuable area of study that merits additional exploration. Continued investigations in this field have the potential to support industrial progress by shedding light on the intricate interplay between social systems and the natural world [6]. It is anticipated that environmental sociology studies can emerge as a significant force within the social sciences, with diverse applications in the years to come. To foster and advance this research direction, it is crucial to deepen our understanding of the unique features, conceptual advancements, and investigative capacities that define environmental sociology. Such knowledge will be instrumental in generating more fruitful and impactful insights for practical implementations in the future.

Recent research trends, as indicated by keyword analysis, show a growing interest in investigating issues of environmental justice, environmental social movements, and the interconnections between climate change, capitalism, and environmental crises within the framework of environmental sociology [23, 48]. Thus, these issues can offer promising directions for the development of theory and empirical research in this field. However, the implementation of environmental sociology research on a broader scale also needs to consider interdisciplinary aspects, given the complexity of the problems faced. Successful collaboration between research institutions and various stakeholders is needed to address these challenges. Nevertheless, the trends that have developed over the past few decades, as discussed in this article, can provide better understanding to scientists, the public, and relevant institutions about the potential and benefits of the environmental sociology approach, thus facilitating its wider application.



Although this article makes important contributions, there are several limitations that need to be acknowledged. Notably, the literature search was restricted to the Scopus database, which means that articles not indexed by Scopus were excluded from the analysis. Although Scopus is an extensive database for bibliometric research [49], this constraint should be taken into account. Future investigations could expand the scope by incorporating additional databases to assess the generalizability of these findings. Moreover, the majority of records cataloged in prominent bibliographic databases like Scopus and Web of Science (WoS) are dual-indexed in both [18]. Despite these limitations, the outcomes of this study can contribute meaningfully to a robust discourse on the scientific literature concerning "environmental sociology research."

## 4. CONCLUSIONS

This comprehensive bibliometric study offers a panoramic view of the evolution of environmental sociology research from 1976 to 2024. By analyzing a robust corpus of 474 articles from 189 journals, authored by a diverse group of 664 scholars from around the world, the study paints a picture of a field that has grown in both prominence and complexity over the past half-century. The United States, the United Kingdom, and Sweden have emerged as the leading centers of environmental sociology research, with major contributions from top universities and influential journals. The field's intellectual landscape has undergone a dramatic transformation, from early concerns about environmental awareness, ecological inequality, and globalization to more recent explorations of climate change, environmental justice, and the Anthropocene.

However, even as environmental sociology has made remarkable strides, it faces a host of challenges and opportunities in the years ahead. The inherent complexity and interdisciplinary nature of environmental issues necessitate a more holistic and collaborative approach, one that brings together scholars from various disciplines and engages key stakeholders. Looking forward, the field must also grapple with a range of pressing questions, from the social dimensions of climate change mitigation and adaptation to the implications of environmental crises for inequality and social justice. To address these challenges, environmental sociologists will need to develop more robust theories and methodologies that can capture the intricate interplay between social and ecological systems. By building on the solid foundation established over the past five decades and confronting these challenges head-on, environmental sociology is poised to make vital contributions to the quest for sustainability and to deepen our understanding of the complex interactions between human societies and the natural world in the age of the Anthropocene.

Finally, as a note for future research, there are several limitations that need to be acknowledged in this article. Specifically, the literature search was conducted only on the Scopus database, which means that articles published in journals not indexed by Scopus were not evaluated. Although Scopus is a comprehensive database for bibliometric analysis, this limitation still needs to be considered. Furthermore, the bibliometric analysis presented in this study primarily focuses on quantitative aspects, such as the number of publications, citations, and collaborations, while qualitative aspects, such as the content and substantive contributions of the publications,

are not explored in depth. Future research could incorporate additional databases and qualitative approaches to deepen the understanding of the development and trends in environmental sociology research and their implications for theory, policy, and practice in addressing sustainability challenges.

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