

Visualizing Climate Change and Gender Inequality Research: A Bibliometric Analysis (2008–2024)

İklim Değişikliği ve Cinsiyet Eşitsizliği Araştırmalarının Görselleştirilmesi: Bibliyometrik Bir Analiz (2008-2024)

ABSTRACT

This research explores the development of scholarly work on gender inequality and climate change. Through a bibliometric analysis of 187 publications indexed in the Web of Science between 2008 and 2024, the study identifies key patterns and contributions in the field. The findings indicate that the United States, the United Kingdom, Australia, South Africa, and China emerge as the leading countries in terms of research output while Lund University stands out as the most productive institution. Publication activity shows a sharp increase beginning in 2018 and reaching its peak in 2023, reflecting a surge of academic interest in recent years. The most frequently used keywords include climate change, vulnerability, women, adaptation, health, and poverty. By mapping these dynamics, the study provides valuable insights into prevailing trends, existing research gaps, and significant advancements within the literature on gender inequality and climate change.

Keywords: Climate Change, Gender Inequality, Bibliometric Analysis, Biblioshiny

ÖZET

Bu çalışma, cinsiyet eşitsizliği ve iklim değişikliği ilişkisi üzerine yürütülen akademik araştırmaların gelişimini incelemektedir. Web of Science veri tabanında 2008–2024 yılları arasında indekslenen 187 yayına ilişkin gerçekleştirilen bibliyometrik analiz sonucunda, alanın temel eğilimleri ve katkıları ortaya konulmuştur. Bulgular, araştırma çıktıları bakımından ABD, Birleşik Krallık, Avustralya, Güney Afrika ve Çin'in önde gelen ülkeler olduğunu; Lund Üniversitesi'nin ise en üretken kurum olarak öne çıktığını göstermektedir. Yayın faaliyetlerinin 2018 yılından itibaren belirgin bir artış sergilediği ve 2023 yılında zirveye ulaştığı görülmekte olup, bu durum son yıllarda alana yönelik artan akademik ilgiyi yansıtmaktadır. Çalışmalarda en sık kullanılan anahtar kelimeler arasında iklim değişikliği, kırılganlık, kadın, adaptasyon, sağlık ve yoksulluk öne çıkmaktadır. Bu dinamiklerin haritalandırılmasıyla çalışma, cinsiyet eşitsizliği ve iklim değişikliği literatüründe hâkim eğilimler, araştırma boşlukları ve önemli gelişmeler hakkında katkılar sunmaktadır.

Anahtar Kelimeler: İklim Değişikliği, Cinsiyet Eşitsizliği, Bibliyometrik Analiz, Biblioshiny

INTRODUCTION

Debates on the association between climate change (SDG 13) and gender inequality (SDG 5) have intensified in the last two decades. Considering that the relationship between climate change and gender inequality is complex and profound, it is examined across multiple dimensions, including how climate change exacerbates gender inequality and the key role women play in climate action. According to a recent report by Nordic Consulting Group A/S (2024), women and girls are particularly vulnerable to the adverse impacts of climate change due to their limited access to resources, such as education, land ownership, financial resources, and technology, as well as existing inequalities that increase their poverty. Climate change deepens gender inequality and threatens rural food security by increasing the workload and vulnerability of women (SDG 5.a.1). Besides, disasters and extreme weather events caused by climate change further exacerbate the vulnerabilities of women and girls. This can lead to higher mortality and morbidity rates, disrupt livelihoods and well-being due to cultural and socioeconomic factors (Nordic Consulting Group A/S, 2024). Thus, numerous policies, programs, and training initiatives have been developed by international bodies. For instance, the OECD develops policy recommendations to increase women's leadership in green businesses, the UNDP runs a program that supports the participation of women entrepreneurs in the green economy and UNESCO offers a training program that develops women's leadership skills to contribute to sustainable development, and CLIMADAPT program by The European Bank for Reconstruction and Development', that aims to increase women's resilience to climate change (Strumskyte et al., 2022).

According to the IPCC (2018), climate change aggravates existing inequalities when the root causes of gender inequality are not addressed, hindering the achievement of the Sustainable Development Goals (SDGs). However,

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it also emphasizes that achieving gender equality and empowering women as agents of change play a key role in combating the climate crisis as well as progressing towards sustainable development. These three concepts are so interconnected that progress in one impacts the others (IPCC, 2018).

Therefore, by exploring the general trends, collaboration networks, core research areas, and evolution of academic studies across different disciplines that address the relationship between gender inequality and climate change, policymakers and practitioners may gain valuable insights. In this context, this study aims to identify gaps, emerging themes, and future research opportunities in the literature by a bibliometric analysis with Biblioshiny. Biblioshiny offers “interactive exploration of data, allowing users to zoom in, filter, or highlight specific elements of interest” (Kumar, 2025:59). The structure of the article is as follows: the following section includes a literature review, then the method and findings are presented. Finally, in the conclusion section, the general implications of the study are summarized, drawing on the findings presented.

LITERATURE REVIEW

Climate change, a global issue with its detrimental impacts on ecological balances as well as social structures, multiplies gender inequalities. On one side, existing studies (IPCC, 2023) show that climate change disproportionately impacts women, particularly in areas with intersectional disadvantages. Climate change exacerbates existing inequalities by reinforcing them, such as women's higher risk of death and illness in disasters, increased violence and child marriage, heavier agricultural workloads and food insecurity, limited access to land, finance and technology, sexual and reproductive health problems, impacted fertility plans, limited access to climate finance, informal employment in just transitions, underrepresentation in decision-making processes and multiple discrimination (Nordic Consulting Group A/S, 2024). On the other side, women are recognized as key change agents for cultivating climate-resilient communities, playing an essential role with their knowledge, networks, and leadership. For instance, women can produce effective, local solutions that improve food security. Besides, their participation in decision-making processes might amplify environmentally sustainable decisions, such as green energy solutions, and contribute to reducing gender inequality and promoting sustainable development. Not only with its ecological and economic dimensions, but also with its impact on gender inequality, climate change shapes development agendas. Without overcoming this issue, the SDGs cannot be achieved. However, tackling climate change effectively requires equipping women to realize their full potential in contributing to climate action through direct goals such as allocating climate finance resources adequately to meet women's needs (Nordic Consulting Group A/S, 2024).

According to prior empirical findings, the impact of climate change on gender inequality varies across countries. Particularly in contexts with high economic risk, corruption, agricultural dependence, and low political stability, it threatens women's potential in farming and housing sectors, while weakening their opportunities in education and policy (Li et al., 2025). In other words, climate change worsens vulnerabilities for women, particularly in countries with weaker economies (Anjum & Aziz, 2025). In these countries, women play a central role in food production and agriculture, and thus they are highly exposed to climate-related disasters (Doss et al., 2018). For instance, in Vietnam, women, particularly older women, who stay in rural agriculture, experience disproportionately intensifying workload and income uncertainty as younger generations migrate to cities for higher living standards. Furthermore, the extreme weather events render the efforts invested largely vain, increase women's responsibilities, and harm gender-based rights (Ylipaa, et al., 2019). In addition, in East Africa, women assume secondary roles in various aspects of life, which restricts their capacity to adapt to climate change (Abebe, 2014). In their systematic literature review on climate change and its impact on gender, Anjum and Aziz (2025) state that increasing temperatures jeopardize the health of mothers and the newborns across Africa. Empirical findings demonstrate that exposure to extreme weather events in South Africa significantly reduces the weekly working hours of women, while there is no significant deviation in men's working hours (Ngepah & Conselho Mwiinga, 2022).

There are empirical studies that focus on the association between gender issues and climate change (Kovaleva et al., 2022), and the intersection of climate change and inequality with poverty (Khan et al., 2024; Pérez-Peña et al., 2021), or a specific sector such as agriculture (Acosta et al., 2021). Thus, the purpose of this study is to examine all aspects of the overall intersection between climate change and gender inequality within a broader framework, encompassing different sectors and social contexts (e.g., health, economy, education, decision-making, etc.) through bibliometric analysis. Investigating the studies that focus on gender inequality and climate change might reveal research trends, gaps, and collaboration networks, guiding future work and evidence-based policies in the field. Thus, the current study might contribute to the improvement of existing policies aimed at mitigating climate change and its detrimental impacts.

METHODOLOGY

This study aims to establish a general framework for research conducted on gender inequality and climate change. In this context, the following research questions are addressed: What are the prominent articles, authors and universities in this field? What are the emerging trends related to the field? What are the key themes and most influential studies shaping the intellectual structure of the field?

In this context, the relevant articles were first identified in the Web of Science database, and then the selected articles were analyzed using the Biblioshiny software. Biblioshiny is a program included within Bibliometrix, which is a package of the R software.

In the Web of Science database, a search was conducted in the “Title, Abstract, Keywords” section using the query “gender inequalit*” and (“climate change*” or “climate variabilit*” or “climate warming*” or “global warming*” or “global temperature*” or “greenhouse gas*” or “greenhouse effect*” or “greenhouse warming*” or “climate cris*” or “anthropogenic warming*” or “anthropogenic emission*” or “carbon emission*” or “global precipitation change*” or “environment* change*” or “sea level rise*”). As a result of the search, a total of 219 studies were obtained. From these, only articles written in English were included, resulting in a final dataset of 187 articles.

Bibliometric analysis basically consists of two types of analysis: performance analysis and scientific mapping analysis. Performance analysis indicators include the number of publications per year, the most cited articles, the most cited journals and authors, collaboration patterns, as well as the most productive institutions and countries (Donthu et al., 2021). In scientific mapping analysis, trends and patterns related to the research field, as well as the evolution of the field over time, are revealed through keyword co-occurrence.

FINDINGS

Table 1 presents general information on the articles included in the study. Accordingly, the relevant articles were published between 2008 and 2024 in 133 different journals. The average number of citations per article is 17.5, while the total number of authors across the articles is 737. In addition, only 31 out of the 187 articles are single-authored, indicating that the subject is open to international collaboration.

Table 1: Main Information

Description	Results
MAIN INFORMATION ABOUT DATA	
Timespan	2008:2024
Sources (Journals)	133
Documents	187
Annual Growth Rate %	18.44
Document Average Age	3.41
Average citations per doc	17.47
References	12593
DOCUMENT CONTENTS	
Keywords Plus (ID)	524
Author's Keywords (DE)	687
AUTHORS	
Authors	737
Authors of single-authored docs	31
AUTHORS COLLABORATION	
Single-authored docs	32
Co-Authors per Doc	4.12
International co-authorships %	46.52

Figure 1 shows the distribution of publications on gender inequality and climate change by year. As seen below, the first studies on the subject were conducted in 2008, and interest in the topic has increased rapidly, particularly after 2018. Considering the growing interest in climate change, it can be said that studies on this issue will attract even greater attention in the coming years.

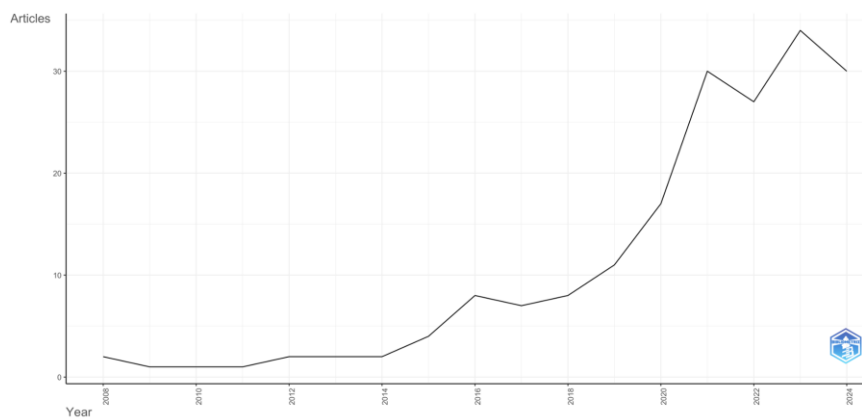


Figure 1: Annual Scientific Production

Figures 2 and 3 present information on the journals that have published the most articles on gender inequality and climate change, as well as the annual distribution of their publications. Figure 2 shows that *Sustainability* is the leading journal in this field, having published 12 articles. It is followed by *Climate and Development* (6 publications) and *Frontiers in Climate* (6 publications). In addition, it can be observed that publications on this topic in *Sustainability* have increased rapidly since 2018 (Figure 3).

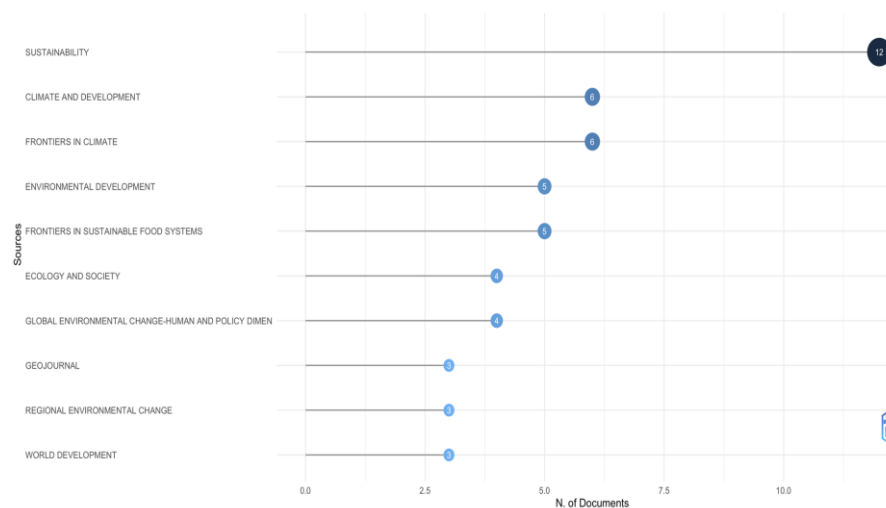


Figure 2: Most Relevant Sources

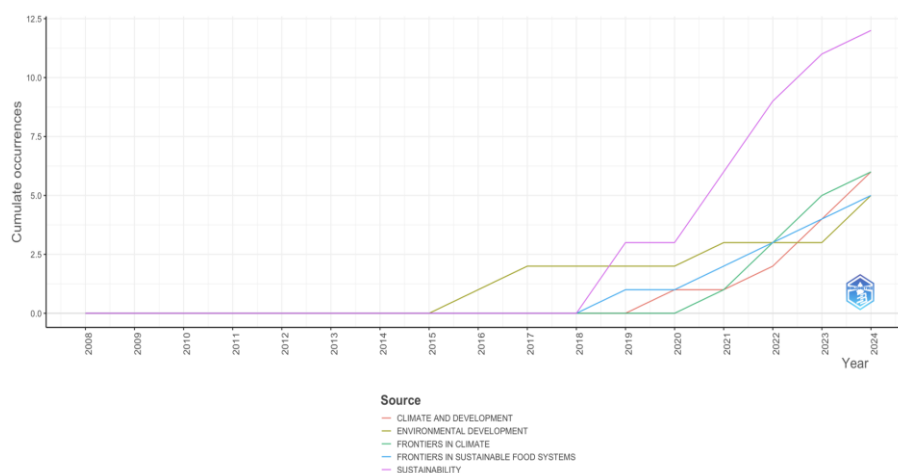


Figure 3: Sources' Production over Time

Below figures 4 and 5 show the distribution of the most productive authors and universities in the field. Authors such as Acosta, M., Feindt, P.H., Van Bommel, S., and Van Vessel, M. are the top contributors to the field, each with 3 articles (Figure 4). Lund University ranks as the leading institution with 13 articles, followed by the University of Lisbon with 11 articles (Figure 5).

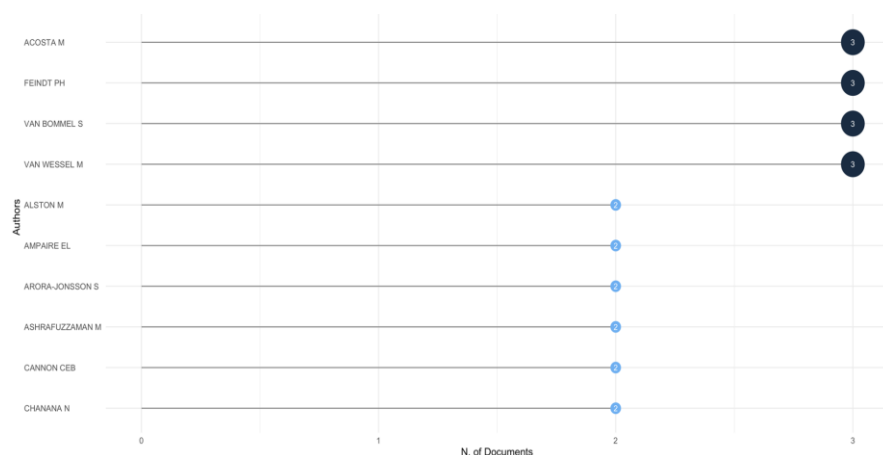


Figure 4: Most Relevant Authors

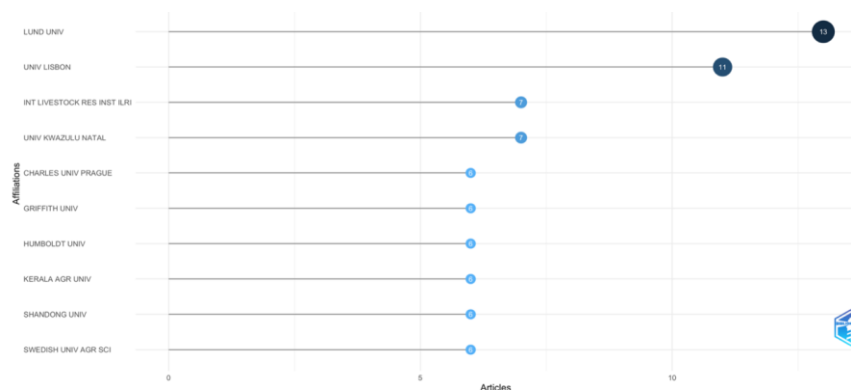


Figure 5: Most Relevant Affiliations

Figures 6 and 7 illustrate the distribution of the total number of publications by country on the subject. Considering that the number of publications decreases from dark blue to light blue in the figure, the United States leads the field with the highest number of publications (111), followed by the United Kingdom (74), Australia (53), South Africa (44), and China (40).

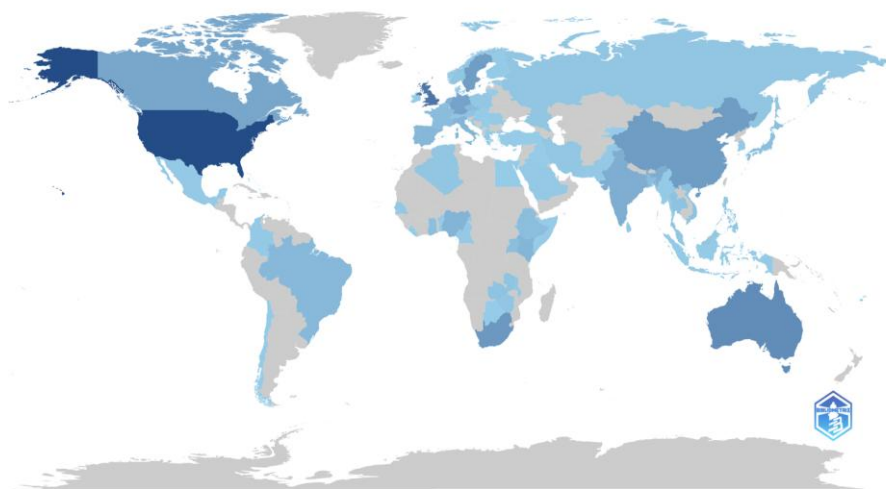


Figure 6: Countries' Scientific Production

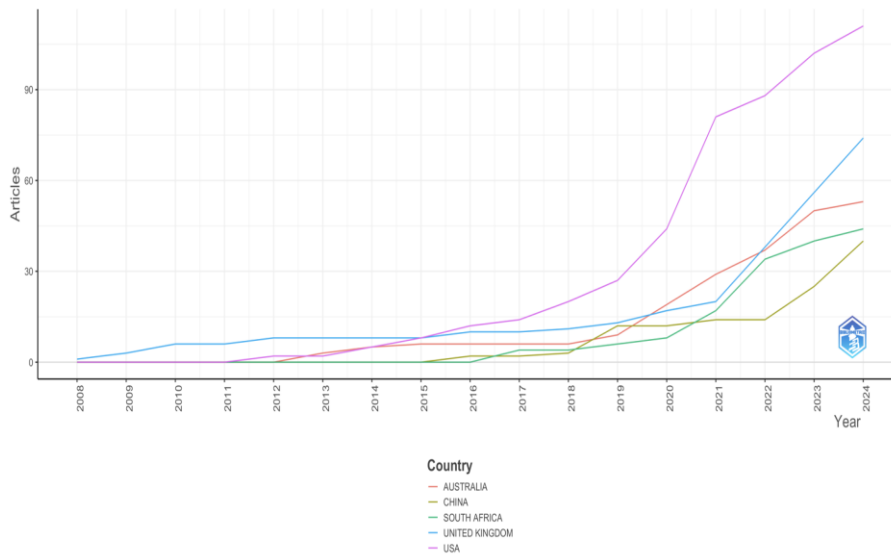


Figure 7: Countries' Scientific Production over Time

The keyword analysis conducted in this study reveals the frequency of the top 15 keywords most commonly used by scholars. As shown in Figures 8 and 9, the term *climate change* is the most frequently used keyword in the field (appearing 50 times in total). Other frequently used terms include *gender* (44 times), *gender inequality* (24 times), and *adaptation* (20 times). In addition, *vulnerability*, *food security*, *climate change adaptation*, and *sustainability* are other prominent keywords.

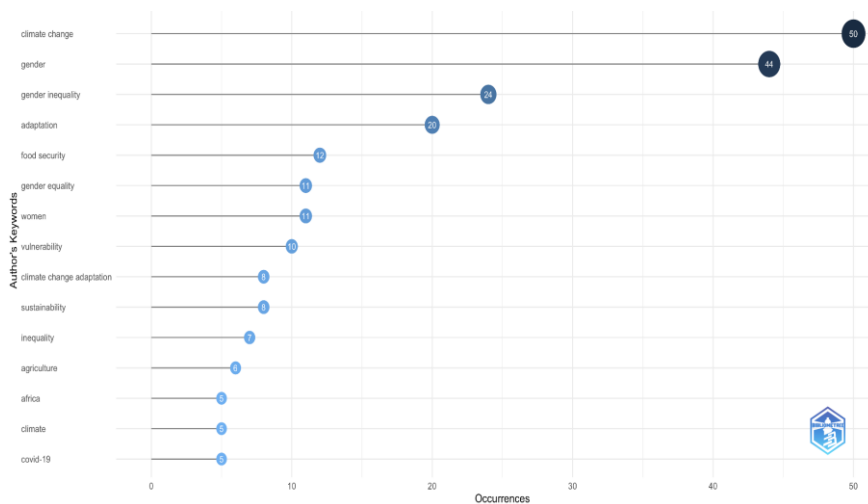


Figure 8: Most Frequent Words



Figure 9: WordCloud

Figure 10 shows the temporal distribution of trending topics derived from the dataset. Accordingly, it can be observed that prominent concepts in the field—such as climate change, gender, and adaptation—have attracted greater attention since 2021.

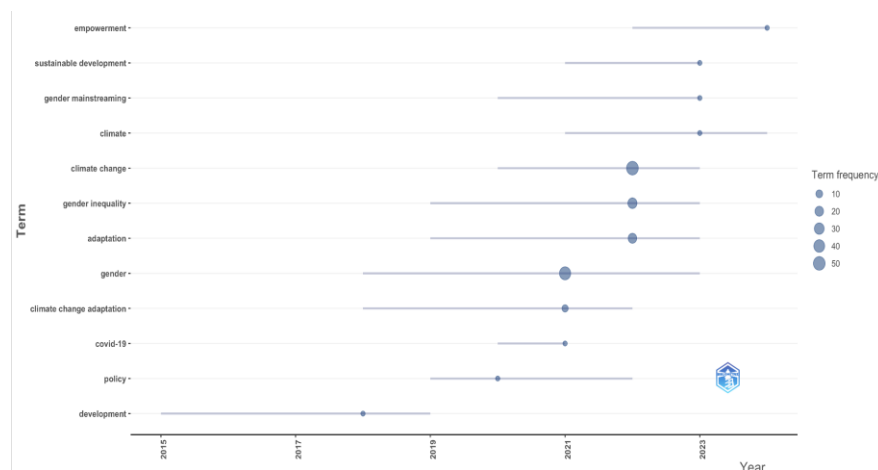


Figure 10: Trend Topics

DISCUSSION

In recent years, the effects of climate change have become increasingly evident across multiple domains. This study focuses on scholarly research addressing the intersection of climate change and gender inequality, employing bibliometric analysis to examine the relevant body of literature. The results demonstrate that both climate change and gender inequality have emerged as growing focal points of academic interest. The United States is identified as the most productive country, while Acosta, M., Feindt, P.H., Van Bommel, S., and Van Vessel, M. stand out as the most prolific authors. Furthermore, the analysis reveals that the most frequently used keywords in this area include *climate change*, *vulnerability*, *women*, *adaptation*, *health*, and *poverty*.

It can be concluded that the concentration of research output within specific countries and authors suggests the need for broader, more diverse contributions, especially from regions most affected by climate impacts.

Considering the trend topics are climate change, gender, and adaptation since 2021, it can be assumed that recent research is not just discussing the impacts but is concentrating on how communities and policies adapt to climate change.

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