International Research Journal of Multidisciplinary Scope (IRJMS), 2026;7(3):739-752 IRJMS

Review Article | ISSN (O): 2582-631X DOI: 10.47857/irjms.2026.v07i03.012804

A Bibliometric Analysis of Climate Change in Economic Policy

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Abstract

Despite the growing volume of research on climate change within the fields of Economics, limited attention has been given to examining the relationship between public finances and climate change, particularly for fiscal policy, public expenditure, public revenue, public debt, and fiscal sustainability. The aim of this study is to provide a comprehensive bibliometric analysis within the "Economics, Econometrics and Finance" subject area indexed in the Scopus database and identify the research gaps in the existing literature. In this paper, an attempt has been made to analyze the publication trends, crucial topics, major journals, citations, authors, and co-authors. Bibliographic data has been used from Scopus database for carrying out this research. Scientific research papers published in the journals have been taken into account as the basis of analysis while other documents such as these, e-books, reviews and conference papers have been excluded in this paper. The keyword co-occurrences, thematic and network visualization analysis have been conducted using VOSviewer Software. The findings suggest that most of the research focuses on agriculture, economic growth, carbon emissions, renewable energy, trade, environmental sustainability, and climate finance. Public finance areas like public expenditure, revenue, fiscal policy and public debt have received limited attention. This suggests a major research gap in the field of climate change and economics. The study also provides valuable insights for researchers and policymakers to incorporate the challenges of climate change into fiscal policy.

Keywords: Bibliometric Analysis, Climate Change, Environment, Green Finance, Public Finance, Sustainable Development.

Introduction

Climate change has become a major global challenge in the twenty-first century affecting economic systems, ecological balance, public finances, and public policy across nations. Climate change, measured by rising global temperatures, extreme weather patterns, and environmental degradation, has caused severe implications for governments and policymakers. Given the critical importance of climate change for the economy, economic research on climate has become a major issue in the economic literature (1). Over the past two decades, the relationship between climate change and economics has emerged as one of the critical nexuses. Researchers have applied various economic methods and tools to study diverse topics such as carbon emission, renewable energy, climate finance, income inequality, sustainable development, etc. (2). With the increasing availability of large databases and softwares, advanced econometric techniques such as time series econometrics, panel data econometrics, cointegration techniques, vector regression and machine-learning-based methods have helped the researchers identify the issues related to climate-economy nexus. The conceptual framework of this paper is based on the relationship between interacting spheres of climate change and economic policies using bibliometric analysis (3). This paper contributes to the existing literature by identifying the broad areas of climate change literature within the economics domain and the underexplored areas of research using a long-term analytical framework. This is an original and significant contribution of this paper that has identified the least explored areas related to public finances viz. fiscal policy, fiscal deficits, inflation, public debt etc. in the field of climate change. There have been various findings in the literature of climate change which are reproduced as follows. Climate change affects the economic growth through various channels by affecting productivity of land, labour, and capital (4). Extreme temperature and erratic rainfall negatively affect the productivity of agricultural land, labour and capital (5). Extreme climate conditions affect all factors of production (6). Investing in climate change adaptation and mitigation measures increases the productivity and economic growth in

(Received 08th April 2026; Accepted 23rd June 2026; Published 13th July 2026)

the long run (7). Climate change has a direct negative impact on the agriculture sector (8). Extreme climate conditions like increasing temperature, fluctuating rainfall and extreme weather events adversely affect agriculture produce, livestock production and deteriorate the soil and water resources (9). Governments are therefore now focusing on the climate-smart agriculture practices to boost and stabilize agriculture production (10). Climate change also has implications for the manufacturing and industrial sector (11). An optimum level of temperature and moisture is needed to run the machines smoothly without any major wear and tear. Any major fluctuations in such climatic parameters cause the breakdown of machinery and equipment and cause the rise in the manufacturing cost of goods (12). It is therefore essential for the government and industries to promote and adapt energy-efficient technologies to reduce emissions and enhance long-term resilience (13).

Climate change is likely to affect the trade pattern among the economies (14). This may be due to the increasing differences in comparative advantage among economies. On the one hand, trade may accelerate the carbon emissions and hence temperature rise in the economies through increased economic production using carbon-intensive production techniques. On the other hand, trade may also help in mitigating the carbon emissions by trading green technologies, renewable energy and zero-emission production technologies (15). There has been a bidirectional nature of causality of trade and carbon emission in economic literature (16). Climate change has implications for the fiscal health of the economy also (17). Climate change negatively affects the production activities and hence tax revenue for the economies, at the same time in order to mitigate the climate conditions, government has to spend heavily on climate adaptation and mitigation (18). The result may be a rise in government's fiscal deficit. This may lead to the issue of fiscal sustainability for the government (19). Given the limited resources of the government, it is required for the government to arrange the finances for the green projects and environmental friendly technologies (20). Both public and private institutions contribute the green finance to the green projects. Developing economies are struggling to obtain enough finances given their substantial need for adopting environmental friendly projects (21). Climate finance mechanism like climate funds, green bonds, carbon credits, concessional loans and grants can play a transformative role especially for developing economies (22).

Given the growing literature on the climate change, it is essential to conduct a comprehensive bibliometric analysis on climate change in economic literature to assess it properly. The current study therefore attempts to explore the following questions regarding climate change issues:

a) How has the field of climate change economics literature developed up to 2025?
b) What are the most productive journals, most impactful articles and most productive authors in the literature of climate change economics?
c) What are the most analyzed characteristics in the literature of climate change economics?
d) What are the research gaps and prospective future research directions in literature of climate change economics?

Methodology

The methodology employed in this paper follows the standard Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework for bibliometric analysis as shown in the Figure 1. The first step in the methodology consists of identifying the objective of the study and then second step is to select an appropriate research database. The third step consists of identifying articles between study period, article exclusion and inclusion criteria and steps four and five deal with downloading all paper relevant to study for further result analysis, discussion and conclusion.

Scopus has been used for database in the analysis. The Scopus database has been used due to its wide coverage of publications, authenticity and high-quality publications. Even previous bibliometric studies heavily rely on the scopus database due to its high-quality indexing standards. The exclusion of other databases like Web of Science, Google Scholar and other regional databases is unlikely to affect the overall findings due to substantial coverage of high-quality peer-review journals under Scopus database. "Climate Change" has been used in search query category. The period 1991-

2025 has been used as time period for the analysis as this period was marked with emerging global climate change discourse and environmental issues. The time 1991 onwards captures the historical evolution of climate change research as this period experienced major global climate change negotiations and agreements. The inclusion criteria choose "Economics, Econometrics and Finance" as subject area to examine the overlapping areas of literature economics and climate change and under document type "Article" has been included to keep consistency and reliability. All articles written in the "English" language for the final stage documents have been included while exclusion criterion excludes books chapters, reviews, book reviews and conference papers from the very beginning of screening stage. The VOSviewer software version 1.6.20 (Center for Science and Technology Studies, Leiden University, Leiden, The Netherlands) has been used for the statistical analysis of this paper. Based on above criteria, 15,412 documents have been identified for the bibliometric and systematic literature analysis.

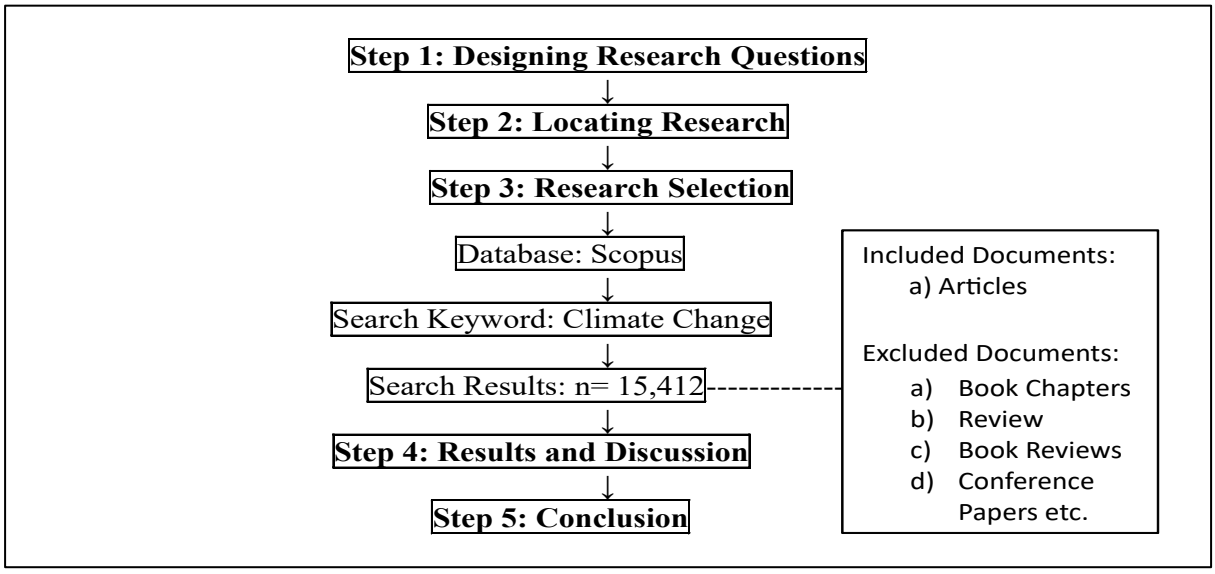

Figure 1: Flowchart for a Systematic Literature Review with Bibliometric Analysis with PRISMA Framework

Results and Discussion

The results of the study are as presented in the form of bibliometric analysis, systematic literature review and network visualization. The bibliometric analysis identifies the major trends in climate change literature using various dimensions. This section provides the analysis of countries with highest number of publications, number of publications over time, top journals for publications, top authors for the publications and various thematic areas in the study of the climate change.

Country Scientific Production

Figure 2 presents the nations with the highest number of publications in the countries. It reveals that the US has the highest number of publications [3564] indicating its leading role in climate research. China is the second largest contributor with 1856 publications followed by UK [1784], Germany [1298] etc. The graph indicates that developed nations dominate the research output in the field of climate change and economics.

The lower production of scientific literature in the developing countries urges an immediate need to allocate more funds by the government and international research organizations to deal with the climate change issues at their level. Knowledge transfer through cross border academic collaboration can bring more contributions by the developing countries. This can also help addressing their local climate and environmental issues.

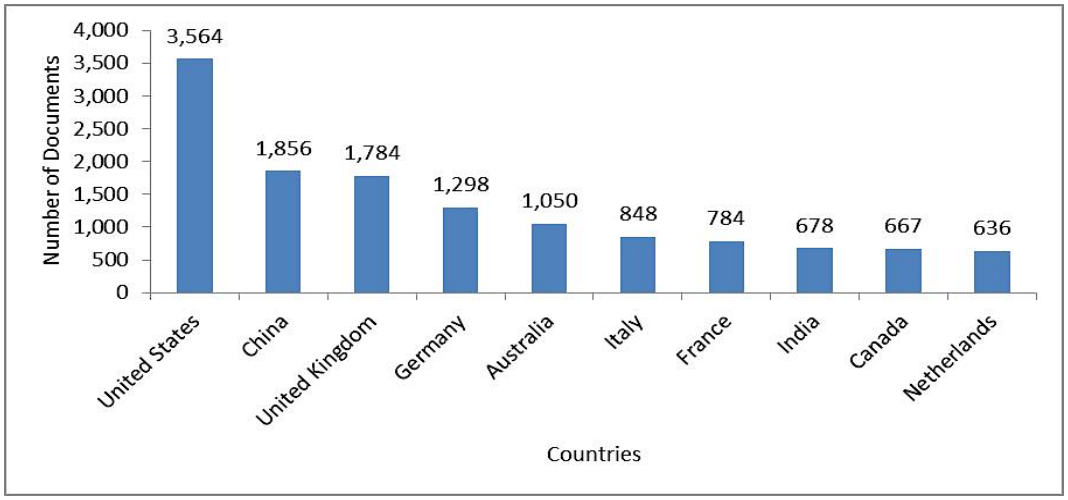

Figure 2: Countries with Highest Number of Publications

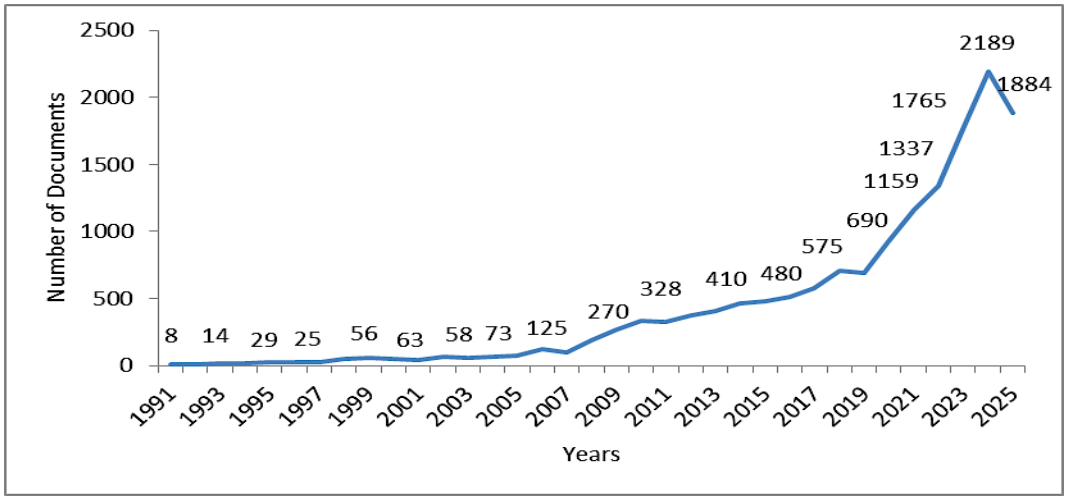

Figure 3: Number of Publications Over Years

Trends of Publications

Figure 3 shows the trend in the number of publications over time related to climate change research in economics. There has been a growing trend of publications related to climate change. In 1991, there were only 8 articles reported and this number has continued to increase exponentially to 2189 in 2023. This suggests that academic interest in climate change started increasing during this period. The increase in climate research after 2010 reflects the increasing involvement of researchers, institutions and policymakers in this discipline. The massive jump in the production of scientific literature was observed after the various international climate negotiations were made like Kyoto Protocol and Paris Agreement at world forum. The governments started allocating funds towards the research and development work in the field of climate change to take into account the climate considerations in their national economic planning.

Top Cited Publications

Figure 4 presents the top ten journals with largest number of publications related to climate change and economic research. The graph shows that the Ecological Economics has been marked as the top journal in the publications with 768 articles followed by Environment Development and Sustainability with 738 and other journals. Broadly, the graph indicates that journals related to environmental economics, sustainability, energy and resources carry a major share in the climate change research journals.

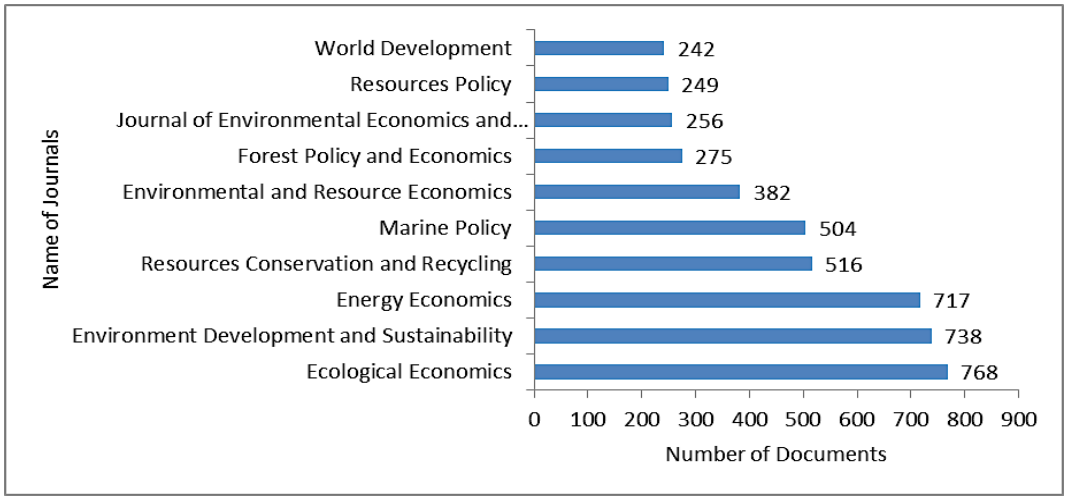

Figure 4: Top 10 Journals by Number of Publications

These journals discussed the various issues for the design of public policy regarding climate change. Besides, they provided an evidence-based results to bridge the gap between general economic research and climate change considerations. The environmental issues cannot be considered as an isolated problem now and have to be integrated with the economics mainstream.

Most Influential Authors

Figure 5 presents the top 10 authors with the highest number of publications in climate change and economics research. The graph shows that Tol RSJ has been identified as top author with 49 articles followed by Mendelsohn R with 39 articles and other authors as presented in the figure. Though the difference among the low ranked author is small, all of them have contributed almost equally in the climate change literature. Generally, a small group of researchers have contributed a substantial proportion of publications in climate change studies.

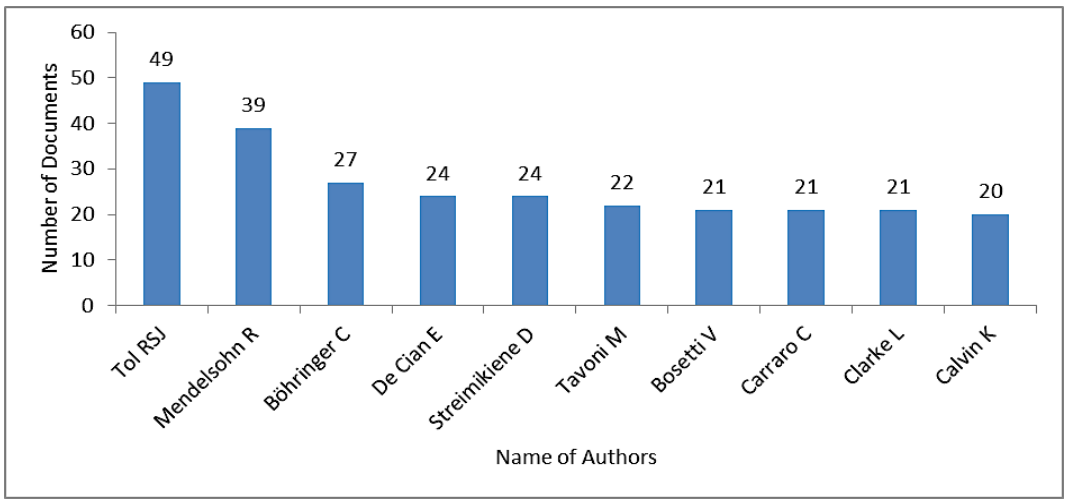

Figure 5: Top 10 Authors with Highest Number of Publications

These authors benefited from the first mover advantage and have strong institutional backing to support their researches from government and international institutions. Besides, these were the prominent authors with extensive collaboration network with other authors. The research grants and extensive collaboration network lead to the high academic research output by these authors.

Most Influential Thematic Areas

Table 1 shows the various thematic issues related to climate change. It shows that energy has been the most influential topic with climate change with 1374 articles, followed by agriculture with 386 articles and other thematic areas as shown in the table. In this part, we mention a few highly cited papers under various themes related to climate change.

Table 1: Thematic Areas of Climate Change

Thematic Area of Climate Change	Number of Publications
Energy	1374
Agriculture	386
Financial Market	375
Trade	365
Industry	354
Economic Growth	184
Carbon Tax	126
Food Security	153
Green Finance	83
Manufacturing	61
Monetary Policy	50
Inflation	26
Public Finance	3

Energy

The nexus between energy change, natural capital resources, and total carbon stock was analysed in China between 1990 and 2019 using the ARDL method. The findings indicated in their studies that the variables higher urbanization and income levels increased environmental pollution, while the renewable energy assists in reducing the carbon stock in the economy (23). The relationship between the variable's energy, climate, and agriculture was analysed in developing Asian countries from 1990 to 2018. The study found that the renewable energy improved the agricultural production, while the climate change negatively affected it (24). The relationship between China's 2018–2020 Plan on Clean Energy Accommodation (PCEA) and sustainable development was analysed. The analysis suggested that the PCEA has slowed sustainable development in the short-run, but it has positive long-run implications for sustainable development (25).

Agriculture

The relationship between the climate change and agriculture was analysed in China. The study revealed that there existed a nonlinear inverted U-shaped relation between crop yields and climate factors (26). The dynamics between the response of China's agriculture response and extreme heat was studied. Extreme high temperature decreases the agricultural productivity and yields in the short-term. However, in the long-term farmers adapt climate change practices which offset 38% of the short-run negative effects on productivity (27). A study was conducted how climate change affected farm income in Africa. Evidence showed that higher temperatures reduced income from dryland crops and livestock. As warming continued, dryland farmers suffered income losses unless rainfall increased or irrigation expanded. The findings indicate that irrigation is possible way to mitigate the climate change in Africa (28).

Financial Aspects and Monetary Policy

The relationship between financial inclusiveness and carbon stock was analysed for 31 Asian countries from 2004 to 2014. The analysis demonstrated that the variables like higher levels of income, energy use, level of industrialization, urbanization, foreign capital, and financial inclusiveness all positively affected the carbon stock in the countries. On the other hand, carbon stocks were reduced by opening trade to the economies. No relationship between financial inclusion strategies and carbon stock was found in their study (29). The relationship between climate change, financial stability and monetary policy was analysed. It has been found that climate change negatively affected the fiscal positions of the both financial and non-financial sectors. It also affected assets prices, credit growth and caused a change in portfolio of investors. It was also found that green quantitative easing monetary policy helped in improving the global warming (30). The relationship between financial inclusion and Environmental Kuznets Curve (EKC) pattern was analysed. The findings indicated that there existed an inverse relationship financial and carbon emissions which signified that as the financial inclusion increases, emissions rise at first but eventually starts falling (31).

Trade

The relationship between output, trade, and energy types and carbon emissions was examined in eight Sub-Saharan African countries between 1980 and 2014. The study revealed that on the one

hand the usage of non-renewable energy channel and trade significantly contributed to CO_2 emissions, while the usage of renewable energy caused a reduction in the carbon stocks. These findings suggest that there is an imperative to shift from carbon emitting fuels to renewable energy green fuels for mitigating environmental impacts in developing economies (32). The relationship between energy resources, trade, and CO_2 emissions was studied in China and Nigeria. It was highlighted in their study that economic development, use of energy, and the usage of renewables were key prime contributors influencing carbon emissions. Trade practice between China and Nigeria can play an influential role in reducing emissions and addressing climate change using clean energy initiative (33).

Manufacturing and Industry

The relationship between climate and the global wine industry was studied. Researchers analysed the causes and impacts of climate conditions on the production of wine grapes and wine and discussed the various solutions to deal with the climate change challenge for the wine industry (34). In a study, the factors behind the climate change related innovations were studied in Australia. The findings indicate that a firm's ability to recognize and adapt the new knowledge helps in addressing climate change. Mutual exchange of such knowledge helps in reducing the carbon emissions (35). Another study was conducted to know how the climate change policies have been impactful to affect the competitiveness of Canadian Industries. It was found in their studies that the efforts to meet the climate goals negatively affect the competitiveness of Canadian industries. However, it was also suggested that other policy mechanism like emission trading can help in reducing such effects (36).

Economic Growth

In a study the relationship between gross domestic product growth and carbon stock was examined. The analysis suggests that as the country's gross domestic product rises, the rate at which carbon emission rises tends to fall. It simply implies that as the economic growth takes place, carbon emissions increase initially and become smaller as economies grow and start adopting cleaner technologies (37). In another study, the drivers of the carbon emission growth were examined in China from 1980 to 1997. The study revealed that fuel transition, energy efficiency, economic development, and population expansion were the critical factors influencing emissions over time (38). Another study examined the relationship between carbon emissions, energy consumption, and economic growth in the United States. The study concluded that usage of non-renewable, industrial energy, and energy used in residential sector contributed to the carbon stock, while the usage of renewable energy limited the carbon stock. The study found that there was an inverse U-shaped relation between gross domestic product growth and emissions which supported Environmental Kuznets Curve hypothesis in the literature (39).

Green Finance

The dynamics how climate finance assists in reducing carbon stock was studied across 46 countries. The authors observed that climate finance substantially reduces the carbon stock level over time. It has been considered a potential tool for reducing carbon emission for the countries (40). The relationship between the impact of climate finance and innovation on environmental protection was studied. The study revealed that both green finance and innovation drastically decreased trade related carbon stock. The impact was found to be higher at higher quintiles (41).

It has been observed that monetary policy, inflation and public finance are the least explored areas of the research related to climate change. These topics can be explored as a part of future research in area of climate change.

Most Influential Institutions

Figure 6 shows the top institutions based on the number of documents related to climate change research. It shows that Vrije Universiteit Amsterdam has highest number of document affiliation with 173 documents, making it leading organization in this discipline. London School of Economics and Political Science is ranked second with 165 publications followed by CNRS Centre National de la Recherche with 150 documents and other institutions as illustrated in the figure. The graph indicates that institutions from Europe, Australia and Asia play a pivotal role in climate change research.

These institutions primarily receive direct funding from the international climate bodies like United Nations and European Union. The sufficient financial support in the terms of research grant is

easily available from these institutions to carry out the research activities in the field of climate change. This eventually helps in bridging the gap between economic research and various emerging aspects of climate change.

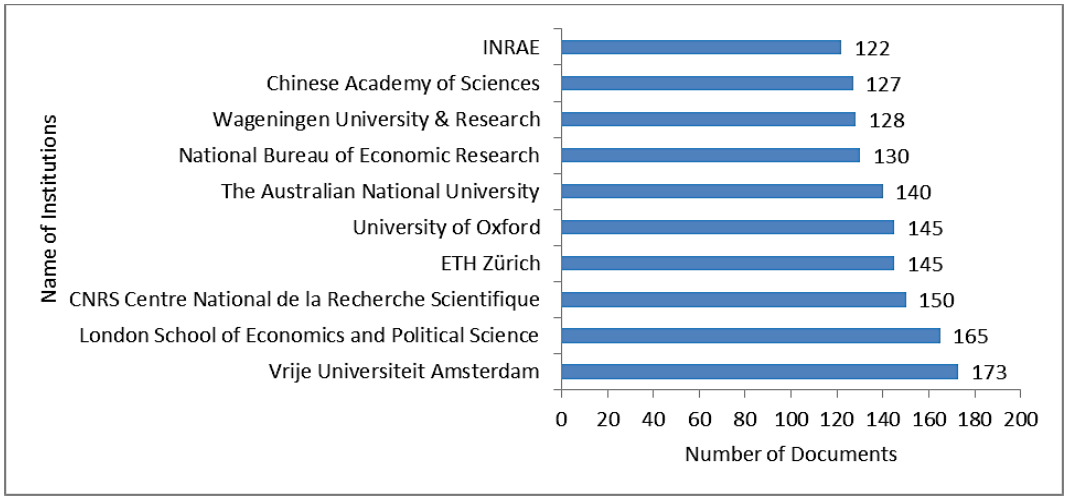

Figure 6: Top Institutional Affiliations by Number of Publications

Most Influential Funding Sponsors

Figure 7 shows number of research studies funded by ten leading sponsors. The National Natural Science Foundation of China is the leading contributor followed by European Commission with 393 documents, National Science Foundation with 238 and other sponsors as depicted in the figure. The majority of the funding institutions belong to Asia and Europe in the dataset. The distribution connotes a strong regional concentration of research support led by China and Europe.

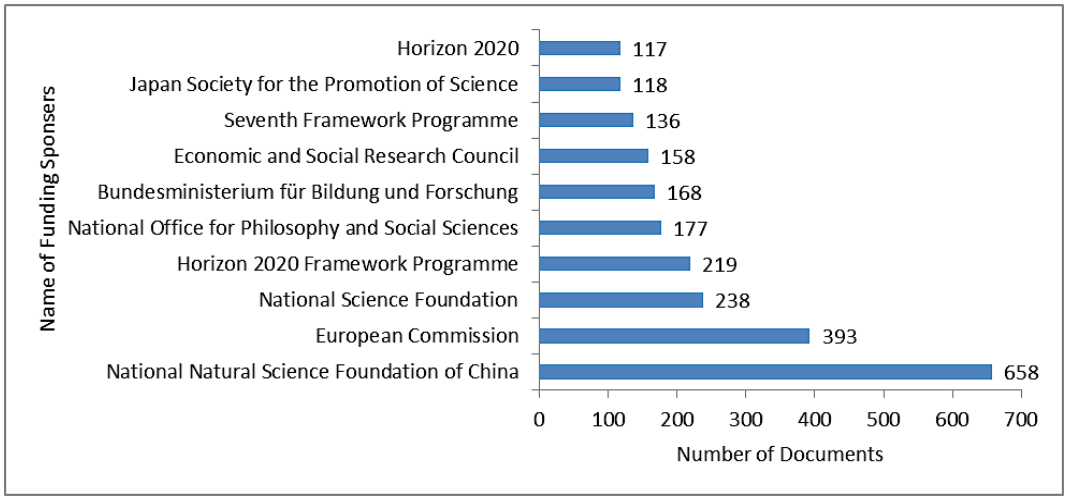

Figure 7: Documents by Funding Sponsors

The majority of research in the field of climate change has been sponsored by state directed and sponsored research. The research funding is aimed to find the evidence-based outcome and the practical aspects of the climate problems like carbon tax, carbon trading and climate subsidies. There has been a lack of funding for climate research in the Global South which needs to be addressed urgently.

Network Visualization

Network visualization analyses various aspects like the countries' co-authorship, co-words occurrence and bibliographic coupling for any systematic and bibliometric analysis. Network analysis helps in creating visual depiction of collaboration, co-occurrences relations, and bibliographic coupling relationships. Nodes size, colour, and the thickness of connected lines are

used in showing the relationship between various selected variables.

Co-authorship of Countries

This analysis explains how the authors belonging to various countries are related to each other on related search areas. It further helps in understanding the structure of countries' contribution in related areas. In this study, to facilitate the network analysis, the minimum articles of a country have been taken as three items which indicates that every country must have at least three publications. A total of 138 out of 219 countries have been taken into account for the analysis as other countries were not related to each other and therefore have been excluded. The prime ten collaborative nations are shown in Table 2 as per the total link strength where the total link strength refers to the cumulative count of articles published by authors by mutual association across diverse nations.

The USA is at the top position with the largest publications in the climate change studies with highest total link strength [2588] and link numbers [3588] across the nations. United Kingdom is having the second largest number of documents [1777] with cumulative link strength [2081]. Developed countries are seen to be more associated with other nations in publishing scientific articles on the climate change as compared to developing countries.

Table 2: Co-authorship of Countries

Country	Documents	Citations	Total Link Strength
United States	3588	146493	2588
United Kingdom	1777	72585	2081
Germany	1856	47971	1500
China	1289	39017	1432
Netherlands	1058	39612	1061
Australia	788	24102	1037
France	631	29974	1028
Italy	834	22087	960
Canada	671	19162	726
Spain	490	14451	589

Keywords Co-occurrence

This analysis is employed in identifying the core research topics in the bibliometric analysis. Unconnected keywords have been excluded from the analysis. For the current study, the minimum keywords have been limited to 5, which resulted in 1976 keywords. Unconnected keywords have been excluded in the analysis resulted into 50 keywords. Table 3 reveals the authors' keywords which show the "Climate Change" has received the largest total link strength [2786] followed by the "Adaptation" [655] and Sustainability [408] and other keywords as shown in the table.

Table 3: Keywords Co-occurrence

Keyword	Occurrences	Total Link Strength
Climate Change	4971	2786
Adaptation	498	655
Sustainability	458	408
Agriculture	323	405
Sustainable Development	394	357
Renewable Energy	332	311
Mitigation	145	243
Economic Growth	218	236
Food Security	220	232
Environment	192	211

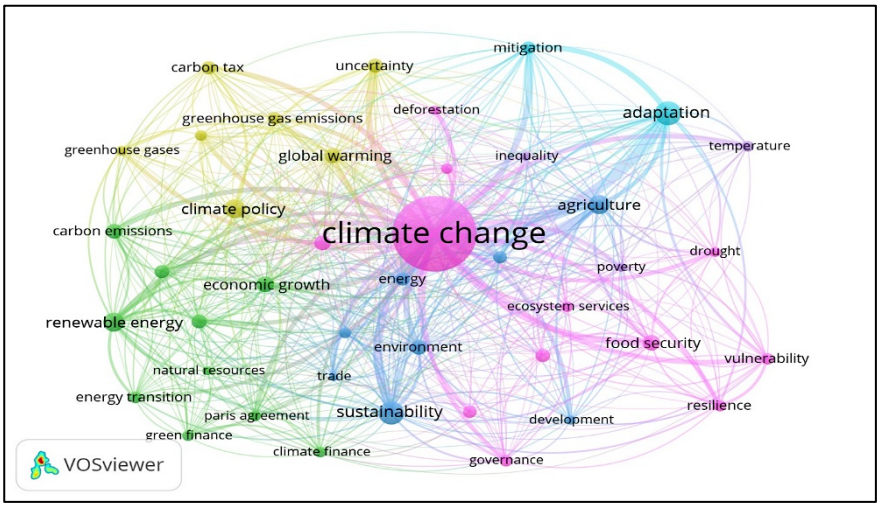

Figure 8: Clusters of Keywords Co-occurrence

Network mapping can be used to show the co-occurrence of authors' keywords as shown in Figure 8. The sizes and colours imply the frequency of the authors' keywords and the number of clusters respectively in climate change literature. The keywords have been divided into different colour clusters as shown in the above figure. The green cluster is characterized by the topics carbon emission, renewable energy, economic growth, and sustainable development and Paris Agreement. The pink cluster focuses on climate change, food security, carbon sequestration, carbon dioxide, climate change adaptation. The yellow cluster includes climate policy, global warming, environmental policy, greenhouse gas emissions. The aqua blue cluster focuses on adaptation, mitigation and inequality and blue colour cluster focuses on energy, trade, environment and sustainability.

Bibliographic coupling: Bibliographic coupling helps in analyzing the intensity of closeness of selected items viz. countries and documents etc. The analysis of bibliographic coupling of countries and articles has been done in the study.

Countries: When the same article is cited from two countries in its reference list, then there occurs bibliometric coupling. Bibliographic coupling states the similarity between publications for countries. The pattern of colours and node sizes help in visualizing the map of bibliographic coupling. The colours and node sizes state the number of clusters and the country's contributions. The bigger nodes in size mean more substantial contribution by the country. The minimum document in a nation has been taken as three and a total of 138 countries out of 219 countries satisfied the criterion.

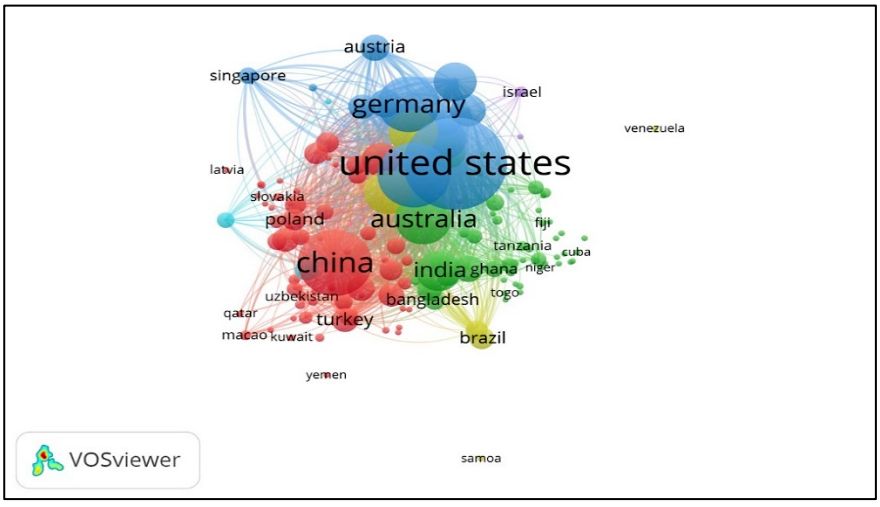

Figure 9: Bibliographic Coupling of Countries

The bibliographic coupling of countries has been shown in different coloured cluster in Figure 9. China is the leading cluster with red colour and is primarily coupled with Malaysia and Turkey. Australia is the second biggest cluster with green colour and has a higher degree of association with India and Indonesia. USA is the third critical country with blue cluster with coupling relation with England, Canada, Japan and Germany. Brazil is associated with New Zealand and Italy with the yellow cluster, while Israel being the fifth leader is more associated with Sudan and Uruguay in purple colour. In the sixth aqua blue cluster, Hong Kong leads after Monaco. In brief, USA has the main influence on the climate change research area, as most of the nations are associated with the USA.

Articles: Bibliographic publications coupling is defined as sharing of same article by two publications as a reference. For this analysis, the closeness of climate change literature is shown by colours and node sizes where the node colours and node sizes imply that clusters existed among climate change publications and the total count of citations received by a research paper. The analysis uses at least 5 citations for the coupling network of climate change literature as shown in Figure 10 with a selection of total of 9740 articles for the analysis.

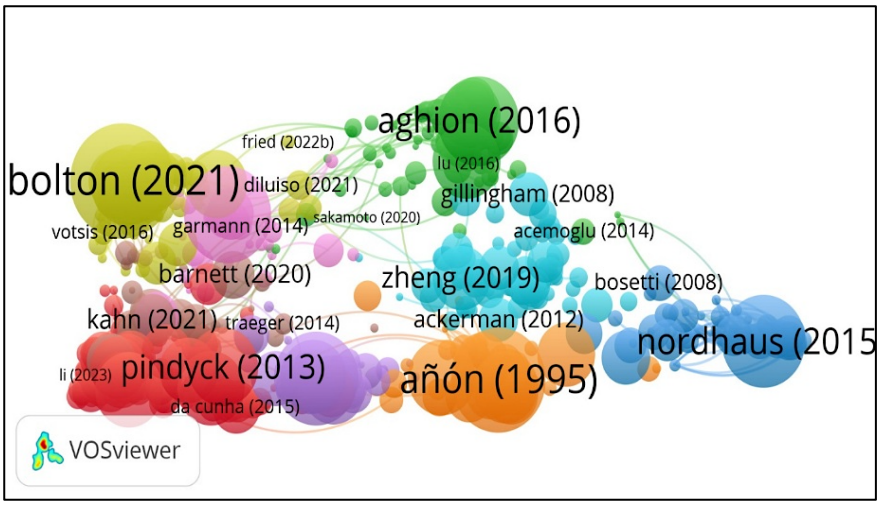

Figure 10: Bibliographic Coupling of Articles

The climate change publications have been divided into various different colour clusters in the Figure 10. Larger nodes imply prominent studies while links between nodes refers to association between authors. One major cluster of authors marked with blue colour focuses on environmental economics and climate policy. Another influential cluster of authors with green colour highlights research on green growth and technological change. The cluster of authors marked by purple colour shows a strong connection by analyzing climate change impact, sustainable development and policy evaluation literature. Likewise, authors marked with red colour cluster focus on climate change impact and social vulnerability. Yellow colour cluster is dominated by authors focussing on business and management responses to climate change. The pink cluster dominated by authors deal with the topics on social and organizational dimensions of sustainability. The authors marked by orange colour cluster focus on valuation methods and climate policy discussions. The authors marked by cyan colour cluster appear to focus on climate economics and energy transition issues. The bibliometric coupling network reveals that research field has become highly interdisciplinary.

The paper provides some specific recommend-dations based on the results. Policymakers should encourage the investment in renewable energy sector as the literature strongly finds that it reduces carbon emissions in long-term. The government should encourage the climate-smart agriculture as the agriculture is most vulnerable sector to climate. Trade should be encouraged to facilitate the transfers of green technologies across borders to mitigate the impact of climate change. Given the limited academic work on public finances, universities and government organiza-tions should encourage more work on the climate change and related areas of public finances like taxation, fiscal deficit, inflation, public debt,

budgeting etc. The governments should encourage the international collaboration between developed and developing countries as the major academic works have been produced by the developed nations only. Integrating the research work with developed countries will bring more insights for the developing nations. Funding agencies should provide more funds for the empirical work on climate change and areas of public finances. Governments and central banks should integrate the climate change framework into their economic planning and climate risk assessment mechanism to examine the sustainability of public finances under climate change scenario.

Conclusion

In short, given the widespread impact of climate change, policymakers need to integrate the climate change issues into economic planning. There is a need for greater policy focus on the area of climate change and public finances due to the identified gap in this study. The present study provides a detailed analysis of bibliometric data related to climate change research in economics by analyzing publication trends, leading countries, important journals, leading authors and major research institutions. The results present a significant growth in scientific publications over time particularly after 2010 citing growing importance of the topic. US has the highest number of publications 3564 followed by China 1856. In 1991, there were only 8 articles reported and this number has continued to increase exponentially to 2189 in 2023. Ecological Economics has been marked the top journal in the publication. Tol RSJ has been identified as top author with 49 articles. Energy has been the most discussed topic with climate change with 1347 articles, followed by agriculture with 386 articles. Vrije Universiteit Amsterdam has highest number of document affiliations followed by London School of Economics and Political Science. National Natural Science Foundation of China is the largest sponsor with the 658 documents followed by European Commission with 393 documents.

Limitations

There are some limitations of this study as only articles published on the Scopus database have been taken into account while reviews, book reviews, technical papers, conference papers etc. have been excluded from the analysis. Besides, in the search options subject area has been confined to Economics, Econometrics and Finance only. Other subject areas can explore for the future analysis to examine the interaction across climate change, economics and other disciplines. Another important limitation of the study is that databases like Web of Science, Google Scholar and other regional databases have not been incorporated in this study but can be used to examine the consistent results for the future research.

Future Scope

The limited scholarly attention on the public finance aspects with respect to climate change has been justified not only on the basis of fewer numbers of publications but also on the fact that the public finance dimensions such as fiscal policy, fiscal deficits, inflation, public debt, budgeting etc. have remained less integrated in the clusters analysis, citation patterns and co-occurrence analysis. The importance of public finances in addressing the issues of climate change such as climate change mitigation and adaptation, disaster management expenditure, green infrastructure spending etc. has gathered momentum over time in practice but there has been a limited academic work on the integration of these aspects. The mismatch between actual policy relevance and academic work justifies the research gap. This can be considered a future direction for research. In summary, the bibliometric analysis contributes to the existing literature by identifying the comprehensive development and research patterns of climate change studies in economics. The results of the study will help future researchers and policymakers identify the research gaps.

Abbreviations

FAO: Food and Agriculture Organization, IEA: International Energy Agency, IPCC: Intergovernmental Panel on Climate Change, OECD: Organization for Economic Cooperation and Development, UNEP: United Nations Environment Programme, UNIDO: United Nations Industrial Development Organization.

Acknowledgement

The authors acknowledge the contribution of all those who assisted in completing this paper successfully.

Author Contributions

All authors contributed equally for the research design and analysis of the data for the manuscript.

Conflict of Interest

The authors declare that they have no financial or non-financial conflicts of interest with the publishers.

Declaration of Artificial Intelligence (AI) Assistance

The authors declare this manuscript has been prepared without using any generative AI. The entire analysis of the paper has been done by the authors independently.

Ethical Approval

The paper is based on theoretical analysis and secondary data so no ethical approval is required.

Funding

No funding has been taken from any person or organization for completing this paper.

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How to Cite: Singh H, Sehgal V, Singh N. A Bibliometric Analysis of Climate Change in Economic Policy. Int Res J Multidiscip Scope. 2026;7(3):739-752. DOI: 10.47857/irjms.2026.v07i03.012804