Revista de Științe Politice. Revue des Sciences Politiques • No. 86 • 2025: 225 – 241

ORIGINAL PAPER

Unveiling The Growing Role of Fintech in Tackling Climate Challenges. A Bibliometric Analysis

Andrei Cristian Spulbar[1)], Otilia Maria Trasca[2)]

Abstract:
FinTech, an innovative blend of financial technology, is emerging as a pivotal solution to tackle pressing climate challenges. This study explores the dynamic intersection of FinTech and climate action, highlighting its transformative role in financing renewable energy, enabling blockchain-based carbon trading, and advancing sustainable investments. Driven by increasing public awareness and interdisciplinary collaboration, FinTech facilitates the transition to a green economy through tools like ESG data analytics, crowdfunding, and digital insurance tailored for vulnerable populations. The bibliometric analysis conducted between 2016-2024 underscores a significant rise in academic interest, with an annual publication growth of 61.6%, emphasizing global engagement from key regions such as China, the EU, and South Asia. Central themes include the reduction of CO2 emissions, economic growth, and renewable energy investments, reflecting a holistic approach to sustainability. This study positions FinTech as not merely a technological innovation but a critical enabler in achieving global climate goals and sustainable economic development.
JEL: G20, Q01, Q54, G23, Q58

Keywords: *FinTech, Climate Change, Sustainable Development, Carbon Emissions, Green Finance*

[1)] Research Assistant/Phd. Student, West University of Timisoara/University of Craiova, "Eugeniu Carada" Doctoral School of Economic Sciences, Romania, Email: andrei.spulbar@e-uvt.ro
[2)] Phd. Student, University of Craiova, , "Eugeniu Carada" Doctoral School of Economic Sciences, Romania, Email: trasca.otilia.q2v@student.ucv.ro

Introduction

Financial technologies, commonly referred to as FinTech, have undergone rapid evolution in recent decades, fundamentally transforming the way financial resources are managed and distributed globally. Simultaneously, climate issues have become one of humanity's most pressing challenges, demanding innovative solutions and interdisciplinary collaborations to address climate change, reduce carbon emissions, and transition to a sustainable economic model. In this context, FinTech is playing an increasingly significant role, offering digital tools for green financing, emissions trading, sustainable investments, and reducing the ecological impact of the traditional financial system.

The growing interest of researchers in the connection between FinTech and climate issues reflects an intensifying global concern about the impact of climate change and the need for a transition to sustainable practices. In recent years, public awareness of the climate crisis has risen significantly, driven by extreme events such as global temperature increases, biodiversity loss, and the heightened frequency of natural disasters. This heightened sensitivity has spurred not only political and economic actions at an international level but also increased academic interest in innovative solutions that can help combat these issues.

In this context, FinTech has emerged as a promising solution, offering digital technologies capable of facilitating the transition to a green economy. Crowdfunding for renewable energy projects, blockchain-based carbon transactions, or digital tools for assessing climate risks are just a few examples of how these technologies can meet the needs of a population increasingly concerned with the impact of climate change. This social pressure, combined with rapid technological advancements, has created a fertile environment for interdisciplinary research exploring FinTech's potential to become a catalyst for sustainable climate solutions.

Given the complexity and scale of climate challenges, FinTech has evolved beyond being merely a branch of financial technology—it has become an essential tool for supporting the transition to sustainability. The application of FinTech in this context spans a wide range of initiatives, from sustainable financing to climate risk analysis. For instance, blockchain-based digital platforms have been utilized to facilitate transparency and efficiency in carbon transactions, providing a secure framework for trading carbon credits and other market instruments essential for reducing global emissions (Addy et al., 2024).

At the same time, FinTech plays a crucial role in financing green projects through crowdfunding and other innovative methods, enabling communities to directly participate in funding renewable energy initiatives or eco-friendly infrastructure projects. These initiatives are supported by advanced technologies that analyze ESG (Environmental, Social, and Governance) data, contributing to better-informed investment decisions and increased trust in sustainable finance (Ashta, 2023), (Elias et al., 2024).

Moreover, FinTech provides solutions for financial inclusion, addressing vulnerable populations most affected by climate change. Through accessible and tailored financial products, such as microfinancing or digital insurance, these technologies can enhance resilience to natural disasters and other effects of climate change (Mhlanga, 2022).

As smart cities become a global priority, FinTech proves to be a strategic ally in the sustainable management of urban resources. By optimizing resource management and

encouraging citizen engagement, these technologies can contribute to creating resilient and ecologically efficient urban ecosystems (Ugochukwu et al., 2024).

Bibliometric analysis provides a systematic perspective on FinTech's contributions to addressing climate change, highlighting not only research trends but also collaboration networks and the academic impact of various works. Recent studies reflect a significant increase in interest in this subject, especially in the context of sustainable development goals and global commitments under the Paris Agreement.

Over the past two decades, literature on the use of FinTech for climate solutions has grown exponentially. This growth is driven by accelerated technological development and social pressure for sustainable solutions. Recent bibliometric analyses show that most publications on this topic originate from countries with advanced digital infrastructure, such as China, the United States, and European Union member states (Wen & Liu, 2023).

In the context of an unprecedented climate crisis and a rapid digital revolution, FinTech has emerged as an essential catalyst for innovative solutions in the transition to sustainability. This intersection between financial technology and climate objectives presents unprecedented opportunities to mobilize resources, improve financial efficiency, and support social inclusion in ways that directly contribute to reducing environmental impact. Recent studies highlight the crucial role of FinTech in facilitating access to environmentally friendly financial tools, such as renewable energy project financing, blockchain-based emissions trading, and the integration of ESG principles into investments.

To fully understand the scope and dynamics of this emerging field, a rigorous methodological approach is essential. Bibliometric analysis, as a research method, not only identifies publishing trends and the most influential authors but also provides a deeper understanding of collaboration networks and future research directions. Accordingly, the following chapter details the methodology employed in this study, describing the process through which relevant literature was systematically analyzed to highlight FinTech's key contributions to climate solutions. This approach provides a solid foundation for interpreting the results and exploring this interdisciplinary subject in depth.

Methodology

The bibliometric analysis presented in this study was conducted to explore the intersection of fintech and climate issues using a systematic and rigorous approach for data collection, processing, and interpretation. The methodology was designed to ensure a comprehensive analysis of the specialized literature, enabling the identification of trends, relationships, and central themes in the field.

The database for this study was created using the Web of Science platform, one of the most prestigious and widely used academic indexing sources, recognized for its extensive coverage and high-quality data. The process of identifying relevant articles included several distinct stages:

- Establishing selection criteria:
  To ensure the relevance of the results, two main categories of search terms were defined:
  1. Terms describing financial technologies (fintech): fintech and financial technologies.
  2. Terms describing climate issues, including: climate change, global warming, carbon emissions, sustainable development, green finance, environmental sustainability, renewable energy, decarbonization,

climate risk, climate resilience, net-zero, environmental impact, circular economy, biodiversity loss, and carbon footprint.

- Search procedure:
  Searches were performed using combinations of terms from the two categories. For example, for each fintech-related term (fintech or financial technologies), searches were conducted in combination with climate-related terms. Thus, the searches included expressions such as *fintech AND climate change*, *financial technologies AND global warming*, or *fintech AND carbon emissions*.
- Filtering results:
  The search results were filtered to eliminate irrelevant articles. Only documents published in indexed journals that met quality and relevance criteria were selected, including the subject of interest, the academic nature of the publication, and the accessibility of complete information about the document.

After collecting the articles, the database, covering the period 2016–2024 and including a total of 195 documents published across 81 different sources, was processed using *Biblioshiny*, an interactive and intuitive extension of the R package *Bibliometrix*. The data contained information about the articles, such as titles, authors, keywords, year of publication, number of citations, publishing journals, and affiliated institutions. To ensure the accuracy of the analysis, the data was cleaned to remove potential errors (e.g., duplicates) and to standardize information. Additionally, incomplete or irrelevant records were excluded.

The use of *Biblioshiny* facilitated a rigorous and comprehensive analysis of the literature. Its intuitive interface allowed for the seamless integration of data and the execution of complex analyses without requiring extensive programming skills. Moreover, its advanced visualization features ensured a clear presentation of the results.

Despite the rigorous methodology, there are some limitations to this approach. The exclusive use of the Web of Science platform may exclude relevant articles from other databases. Furthermore, while the selection of keywords was extensive, it might omit emerging or less obvious related topics.

Results

Figure 1. Data base summary

Source: Authors` own processing using the Biblioshiny application

The bibliometric analysis data highlights a rapidly expanding field, with an impressive annual growth rate of 61.6% in publications over the period 2016–2024. This growth reflects a growing interest among researchers, suggesting that the analyzed topic is an emerging one with significant academic and practical potential. Additionally, with a

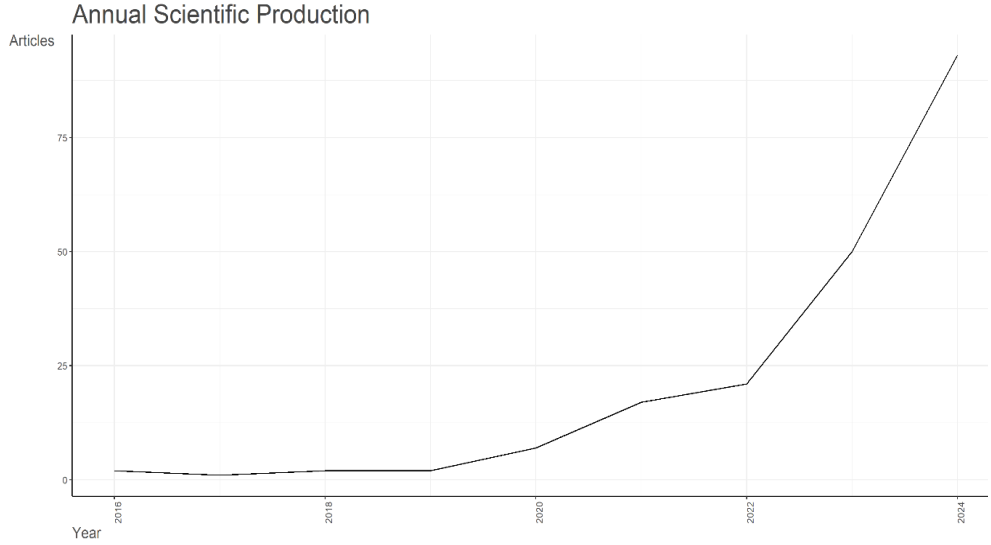
total of 195 documents published in 81 distinct sources, the studied field benefits from a notable diversity of dissemination channels, including journals, books, and other types of publications.

The academic impact of these works is considerable, with an average of 26.89 citations per document, indicating a significant influence within the scientific community. Furthermore, the large number of references cited—over 10,000—demonstrates a solid foundation of pre-existing literature, contributing to the validity and relevance of the research in this domain.

Collaboration among researchers is another remarkable aspect of this field. With a total of 603 authors involved and an average of 3.39 co-authors per document, there is a clear trend of cooperation at both local and international levels. Approximately 44.62% of the papers result from international collaborations, underscoring the global nature of the issues addressed and the need for an integrated perspective to tackle the analyzed challenges.

From a thematic perspective, the diversity is evident, with 327 terms from Keywords Plus and 494 keywords provided by the authors. This variety indicates a broad exploration of related topics and reflects the interdisciplinary nature of the research. The predominance of articles (168 out of 195 documents) demonstrates that academic journals are the primary publishing medium, although other types of works, such as book chapters and early access papers, also contribute to the diversity of dissemination channels.

Figure 2. Annual Scientific Production



Source: Authors` own processing using the Biblioshiny application

The annual analysis of scientific output on fintech and climate issues shows rising academic interest, as the intersection of financial technology and sustainability gains global importance.

From 2016 to 2019, only 1–2 articles were published annually, reflecting the field's early stage when fintech was mainly viewed as a financial innovation, not yet linked to climate solutions.

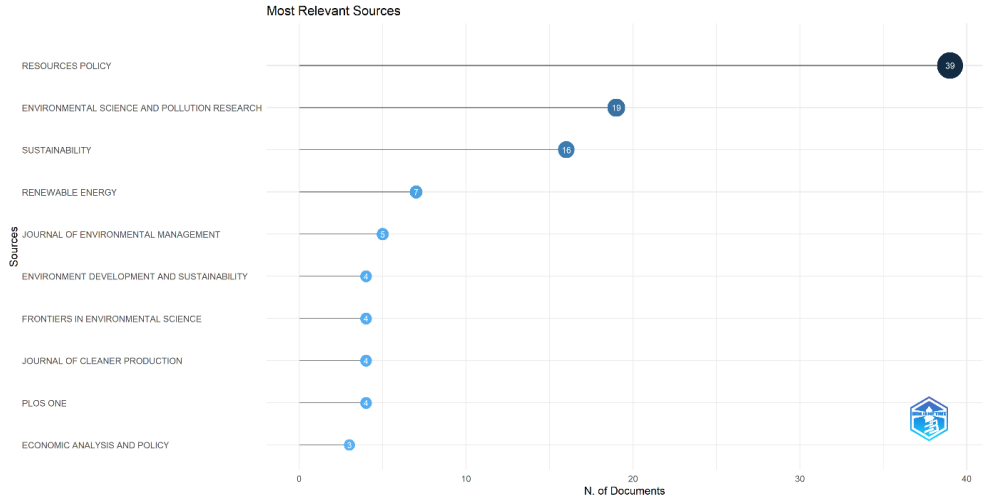
In 2020, publications rose to 7, signaling a shift as fintech began to be recognized for its role in sustainable finance, carbon markets, and green investments.

Steady growth continued in 2021 (17 articles) and 2022 (21 articles), with expanding research topics including blockchain for carbon transactions and crowdfunding for renewable energy.

A major jump occurred in 2023 with 50 articles, nearly doubling the previous year, driven by global climate targets and tech advances. In 2024, a record 93 articles solidified the field as a key research area, attracting diverse scholars.

This trend underscores fintech's growing potential in climate action and the urgency of innovative, tech-driven solutions to environmental challenges.

Figure 3. Most Relevant Sources



Source: Authors` own processing using the Biblioshiny application

The chart of key sources on fintech and climate issues reveals the field's thematic diversity and interdisciplinarity, showcasing how fintech supports sustainability and climate action.

Resources Policy leads with 39 articles, linking fintech to natural and economic resource management, highlighting the importance of economic and policy perspectives in climate-related fintech applications.

Environmental Science and Pollution Research (19 articles) focuses on technical and scientific aspects, such as using fintech for pollution monitoring, carbon markets, and clean energy financing.

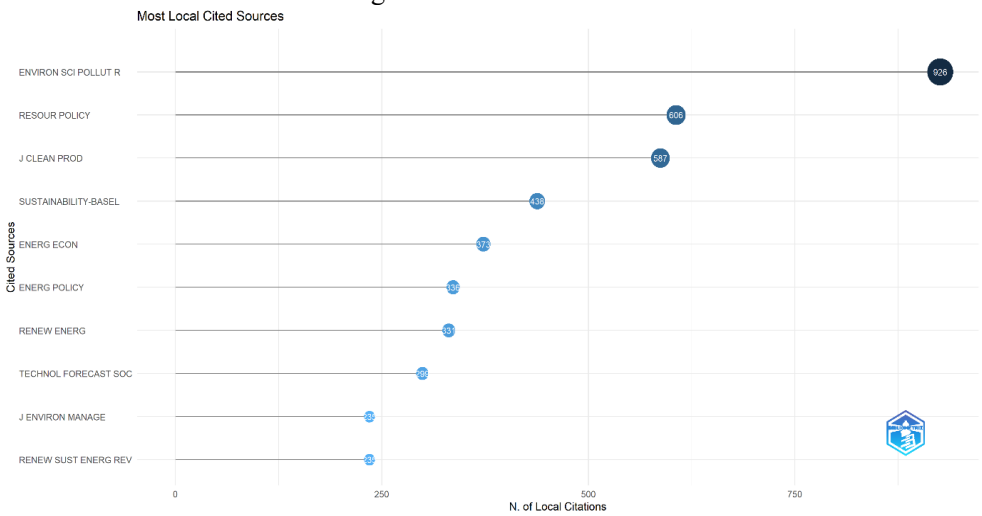
Sustainability (16 articles) reflects the field's holistic nature, addressing financial innovation, energy transition, and fintech's role in achieving sustainable development goals.

Renewable Energy (7) and Journal of Environmental Management (5) emphasize practical applications in renewable energy and resource management, showing fintech as a driver for low-carbon transition.

Journals like Environment Development and Sustainability, Frontiers in Environmental Science, and Journal of Cleaner Production (each with 4 articles) highlight fintech's role in sustainable development and clean production.

Other sources such as PLOS ONE and Economic Analysis and Policy demonstrate the research diversity, covering scientific, economic, and policy-oriented approaches to fintech and climate challenges.

Figure 4. Most Local Cited Sources



Source: Authors` own processing using the Biblioshiny application

The chart on the most locally cited sources reveals the foundational journals shaping research at the intersection of fintech and climate issues.

Environmental Science and Pollution Research leads with 926 citations, underscoring the importance of fintech in pollution monitoring, reduction, and environmental management.

Resources Policy (606 citations) confirms the centrality of economic and resource management strategies, highlighting fintech's role in supporting the green economy.

Journal of Cleaner Production (587 citations) emphasizes fintech's impact on sustainable production and the circular economy, especially in financing clean projects and reducing supply chain emissions.

Sustainability-Basel (438 citations) reflects an interdisciplinary focus on sustainable development, including topics like green crowdfunding and blockchain for resource management.

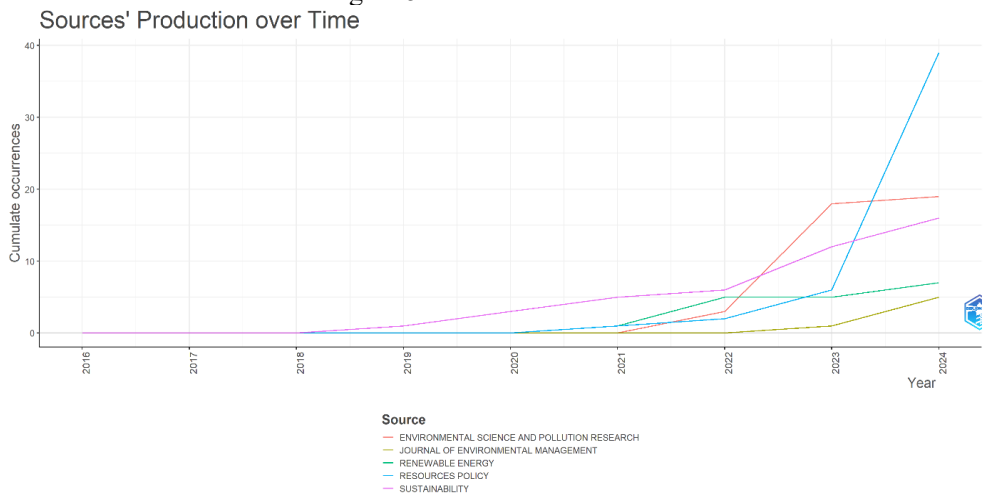
Energy Economics (373) and Energy Policy (336) highlight fintech's role in financing and regulating renewable energy and energy efficiency initiatives.

Renewable Energy (331) and Renewable and Sustainable Energy Reviews (235) link fintech to clean energy investment and adoption.

Technological Forecasting and Social Change (299) points to fintech's potential in forecasting and addressing social and climate challenges through innovation.

Journal of Environmental Management (235) highlights fintech's role in monitoring and optimizing environmental impacts.

Figure 5. Sources Production over Time



Source: Authors` own processing using the Biblioshiny application

The graph showing source production over time highlights the growing academic interest in fintech's role in addressing climate issues.

From 2016 to 2018, no articles were published, reflecting the field's early absence. In 2019, the first article appeared in *Sustainability*, signaling initial exploration. By 2020, interest increased slightly with three articles in the same journal.

In 2021, diversification began: *Resources Policy* and *Renewable Energy* published their first articles, indicating broader attention to renewable energy and policy implications.

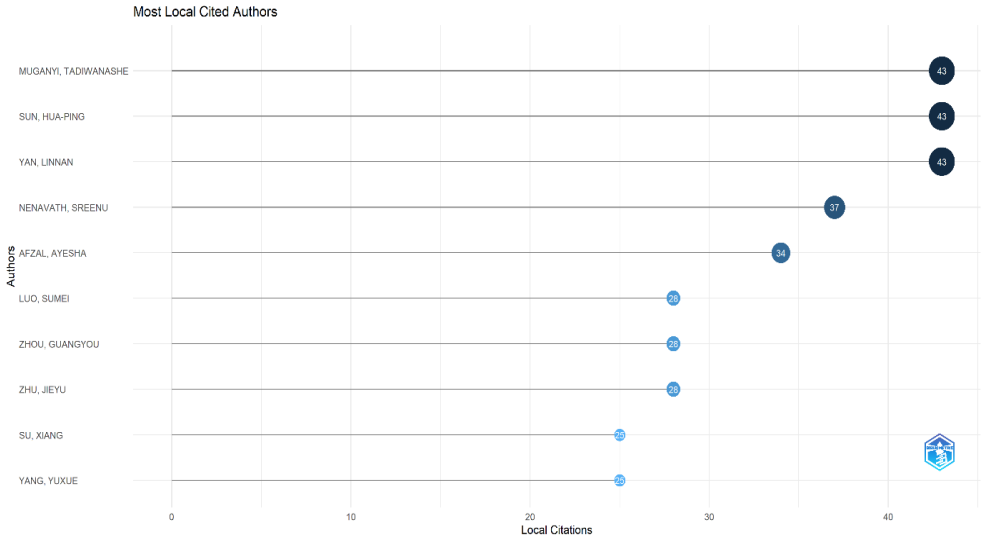
In 2022, growth accelerated with more articles in *Environmental Science and Pollution Research*, *Renewable Energy*, and *Sustainability*. *Resources Policy* also became more active, reflecting rising interest in policy and economic angles.

A major shift occurred in 2023: *Environmental Science and Pollution Research* published 18 articles, *Resources Policy* 6, and *Sustainability* and *Renewable Energy* remained strong contributors. This marked the field's maturation and interdisciplinary appeal.

In 2024, *Resources Policy* led with 39 articles, cementing its role in economic and environmental policy research. *Environmental Science and Pollution Research* (19), *Sustainability* (16), *Renewable Energy* (7), and *Journal of Environmental Management* (5) also saw notable growth.

The sharp rise in publications reflects the field's rapid development and the increasing focus on fintech-driven solutions for climate challenges and the green economy transition.

Figure 6. Most Local Cited Authors



Source: Authors` own processing using the Biblioshiny application

The graph on the most locally cited authors highlights the key researchers shaping studies on fintech and climate issues, forming the theoretical and methodological foundation of the field.

Muganyi Tadiwanashe, Sun Hua-Ping, and Yan Linnan top the list with 43 citations each, indicating their pivotal role in topics like sustainable finance, carbon markets, and green fintech development.

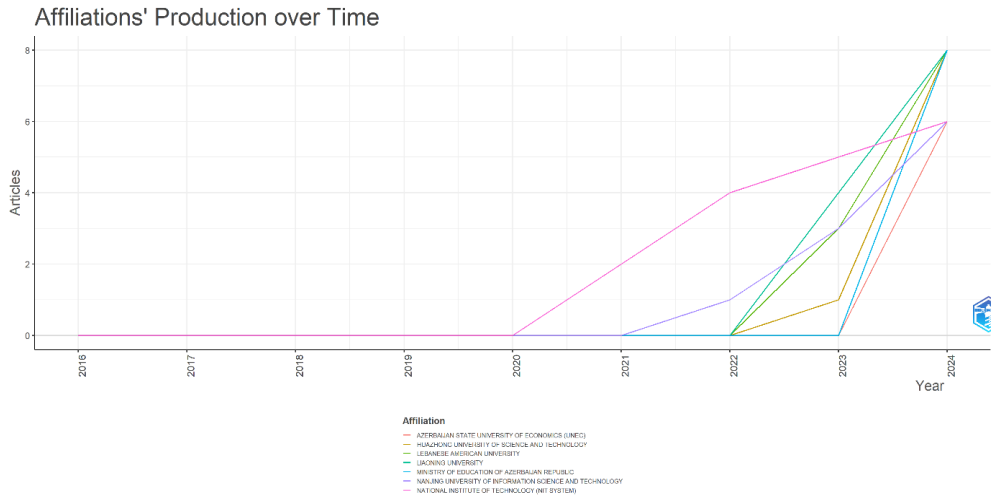
Nenavath Sreenu (37 citations) and Afzal Ayesha (34) follow, suggesting strong interest in their work, likely focused on fintech applications in renewable energy and climate risk assessment.

Luo Sumei, Zhou Guangyou, and Zhu Jieyu (28 citations each) also show significant influence, contributing to understanding fintech's role in resource management and green investments.

Su Xiang and Yang Yuxue (25 citations each) are notable for their work on carbon reduction and regulatory strategies in sustainable fintech.

These frequently cited authors are central to local research, their work shaping current academic directions and highlighting core themes in the fintech–climate nexus.

Figure 7. Affiliations` Production over Time



Source: Authors` own processing using the Biblioshiny application

The graph on institutional production over time reveals growing academic engagement in research on fintech and climate issues, especially in recent years.

From 2016 to 2020, no institutional contributions were recorded, indicating the field was not yet a research focus. In 2021, the National Institute of Technology (NIT System) published the first two articles, marking the field's academic emergence.

In 2022, output increased slightly, with four more articles from NIT and one from Nanjing University of Information Science and Technology, signaling early expansion.

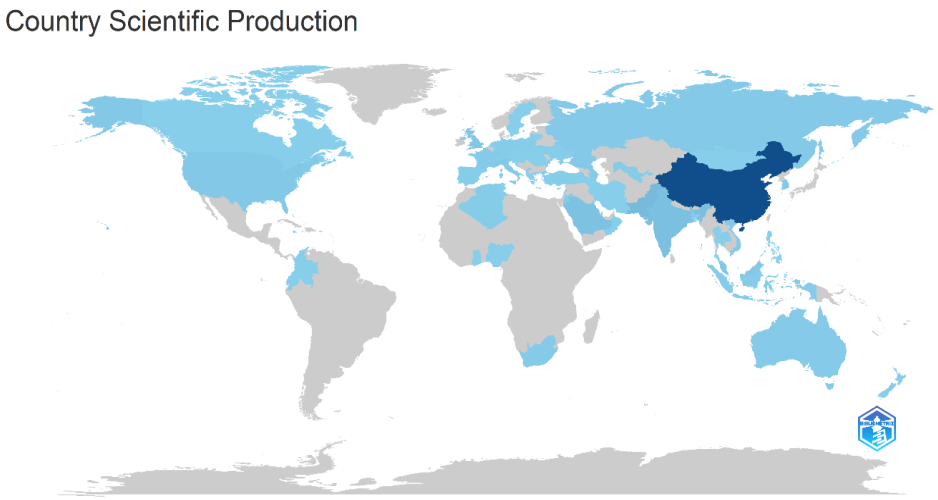
A notable rise occurred in 2023, as NIT published five articles and institutions like Liaoning University (4) and Lebanese American University (3) joined, reflecting broader interest and diversification.

2024 saw a major surge: Huazhong University of Science and Technology, Lebanese American University, Liaoning University, and the Ministry of Education of Azerbaijan Republic each published eight articles. NIT and Azerbaijan State University of Economics (UNEC) followed with six each, confirming their strong research engagement.

This expansion demonstrates the global relevance of fintech-climate research, with institutions from Azerbaijan, China, and Lebanon playing key roles. NIT, active since 2021, stands out as a pioneer, helping establish the field’s foundation.

Overall, the data highlights a maturing research domain and emphasizes the growing importance of international collaboration in addressing climate challenges through fintech.

Figure 8. Country Scientific Production



Source: Authors` own processing using the Biblioshiny application

The analysis of scientific production by country reveals a strong global interest in fintech's role in addressing climate issues, with notable regional contributions and international collaboration.

China leads with 278 articles, establishing itself as the global leader. This reflects its strategic focus on integrating fintech into green economy policies, supported by advanced tech infrastructure and sustainability-driven agendas.

Pakistan (42 articles) and India (30) show strong engagement in South Asia, likely driven by regional challenges such as pollution, food security, and the need for energy transition.

In the Middle East, countries like Saudi Arabia (26), Bahrain (5), and Qatar (3) are increasingly active, reflecting efforts to diversify their economies and invest in green fintech initiatives.

Western countries including the UK (15), Italy (13), USA (11), and France (7) contribute meaningfully. While their volume is lower, their research often carries significant impact, supported by strong academic infrastructure.

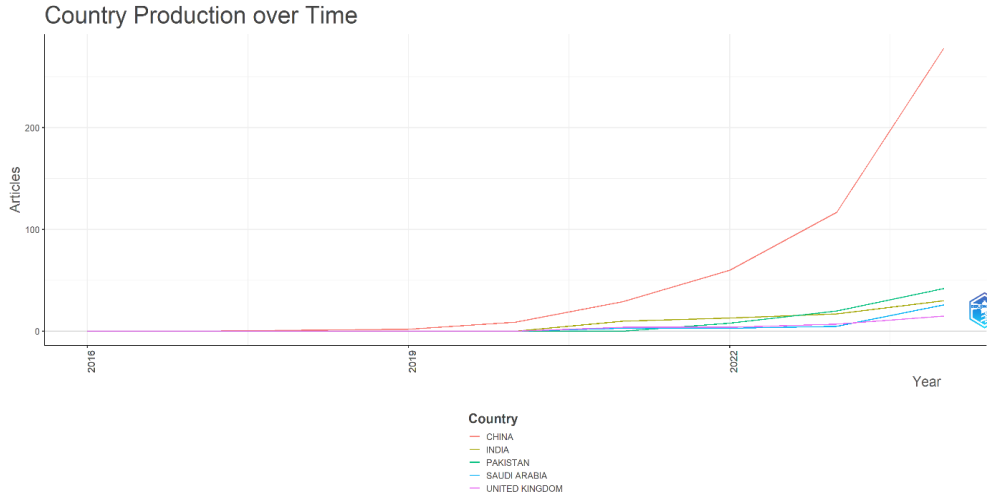
Emerging contributors like Azerbaijan, Lebanon, Russia, South Korea, and Vietnam (each with 9 articles) point to growing interest in fintech–climate research, often linked to international projects or regional collaborations.

Countries with smaller but notable outputs—such as Romania, Algeria, Germany, and Sweden (2–6 articles)—suggest potential future research hubs.

Unique contributions from Ghana, Lithuania, Singapore, and New Zealand reflect the truly global spread of interest, even at a symbolic level.

Overall, the data shows concentrated leadership from China, growing participation from emerging economies, and broad international collaboration—highlighting fintech's global relevance in tackling climate challenges.

Figure 9. Country Production over Time



Source: Authors` own processing using the Biblioshiny application

The graph highlights rapid global growth in academic research on fintech and climate issues, with China leading decisively. After minimal output in 2018–2019, China's production surged: 9 articles in 2020, 29 in 2021, 60 in 2022, 117 in 2023, and 278 in 2024. This exponential growth reflects strong institutional support, policy focus, and research investment in sustainability and fintech integration.

India began contributing in 2021 (10 articles), with steady growth to 13 in 2022, 17 in 2023, and 30 in 2024, showing rising academic interest in fintech solutions for climate challenges like pollution and energy transition.

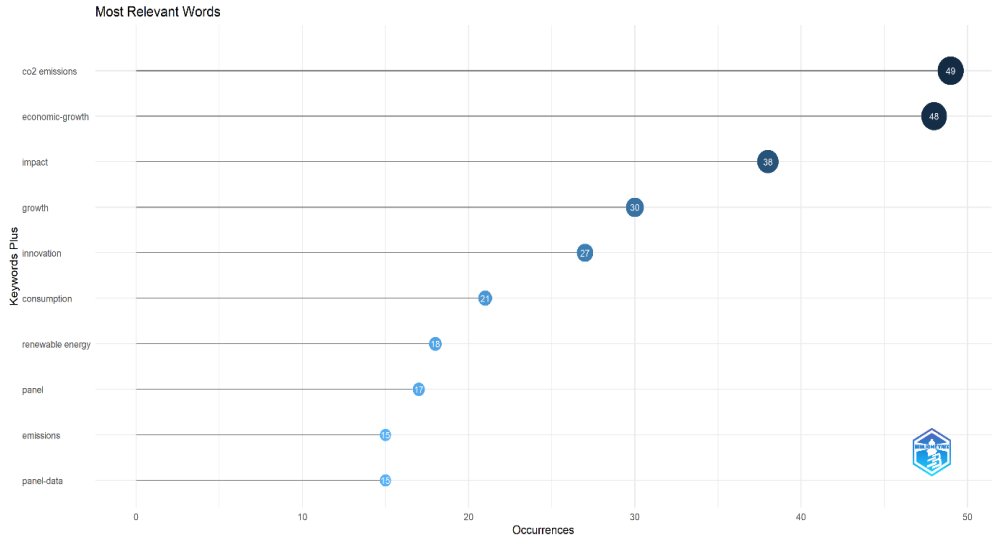
Saudi Arabia entered the field in 2021 (3 articles), maintained that output in 2022, then grew to 5 in 2023 and 26 in 2024. This sharp rise aligns with national initiatives like Vision 2030 and the shift toward economic diversification and sustainability.

The United Kingdom started in 2021 with 4 articles, followed by consistent growth: 4 in 2022, 7 in 2023, and 15 in 2024. This reflects its strong research tradition and interest in fintech's role in sustainable finance and public policy.

Pakistan joined the field in 2022 (8 articles), with significant growth to 20 in 2023 and 42 in 2024. This rapid increase suggests strong academic engagement with fintech's potential to address regional climate vulnerabilities and infrastructure challenges.

Overall, the data shows China at the forefront, with other countries—especially India, Pakistan, Saudi Arabia, and the UK—expanding their contributions. This global spread reflects both diverse national priorities and a shared interest in fintech-driven climate solutions. The rise of emerging economies in this research area suggests a democratization of knowledge and increased international collaboration.

Figure 10. Most Relevant Words



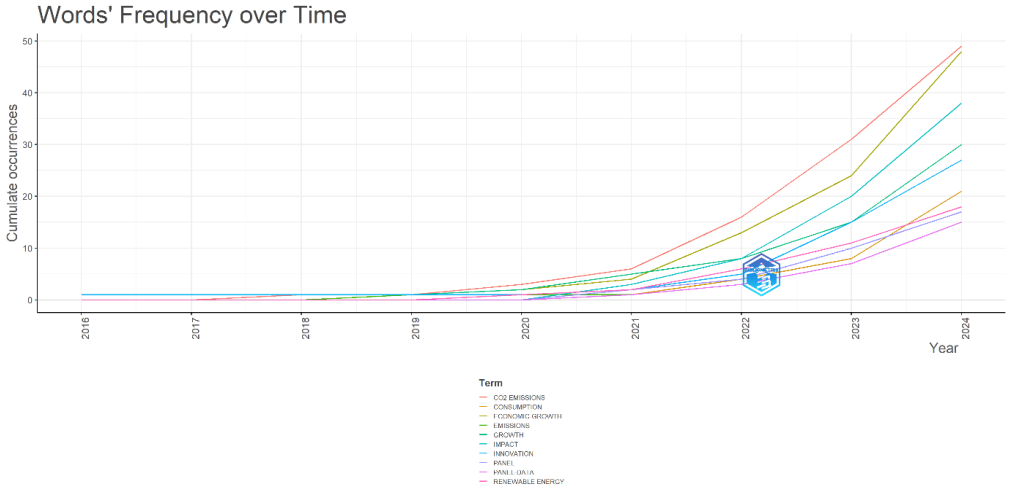
Source: Authors` own processing using the Biblioshiny application

An analysis of the most frequent terms reveals the main themes in literature on fintech and climate issues: economic impact, innovation, and sustainability.

- CO2 emissions tops the list with 49 mentions, emphasizing its central role in fintech-related climate research—particularly in areas like carbon markets and green financing.
- Economic growth appears 48 times, showing strong interest in how fintech can drive sustainable development.
- Impact (38 mentions) reflects the broad effects of fintech across climate, economy, and innovation.
- Growth (30 mentions) supports this, also pointing to fintech adoption and renewable energy expansion.
- Innovation, cited 27 times, underlines the importance of tools like blockchain, crowdfunding, and digital platforms in addressing climate challenges.
- Consumption (21 mentions) signals concern for environmental effects of consumer behavior, with fintech positioned to track and influence it.
- Renewable energy (18 mentions) highlights fintech's role in financing clean energy initiatives.
- Panel (17) and panel data (15) indicate frequent use of quantitative methods to analyze tech-climate-economic links.
- Emissions, mentioned 15 times, reiterates the focus on pollution reduction.

Overall, the dominant terms reflect key research priorities: cutting emissions, advancing innovation, fostering green growth, and applying empirical, interdisciplinary approaches.

Figure 11. Words` Frequency over Time



Source: Authors` own processing using the Biblioshiny application

The graph depicting the frequency of words over time provides a clear view of the evolving academic interest in key themes within the domain of fintech and climate issues. The data analysis highlights both consistent growth and shifts in research priorities.

In the early years (2016–2018), the frequency of terms is very low, indicating an initial academic interest in this domain. Terms such as *growth* and *innovation* appear only once per year, suggesting that early research focused on innovation and growth as factors of technological development, without explicitly addressing connections to climate issues.

Starting in 2019, terms like *CO2 emissions*, *economic-growth*, and *emissions* begin to appear more frequently, reflecting an expansion of research into sustainability and climate impact themes. This indicates that fintech was starting to be recognized as a potential tool for reducing emissions and supporting sustainable economic growth.

In 2020 and 2021, the increase in the use of terms becomes more pronounced. *CO2 emissions* rise from 1 to 6 occurrences, while *economic-growth* and *growth* become increasingly frequent topics. Terms such as *renewable energy* and *panel* also start to be used more often, suggesting that research is becoming more complex, integrating themes like renewable energy and the use of quantitative methodologies to analyze empirical data.

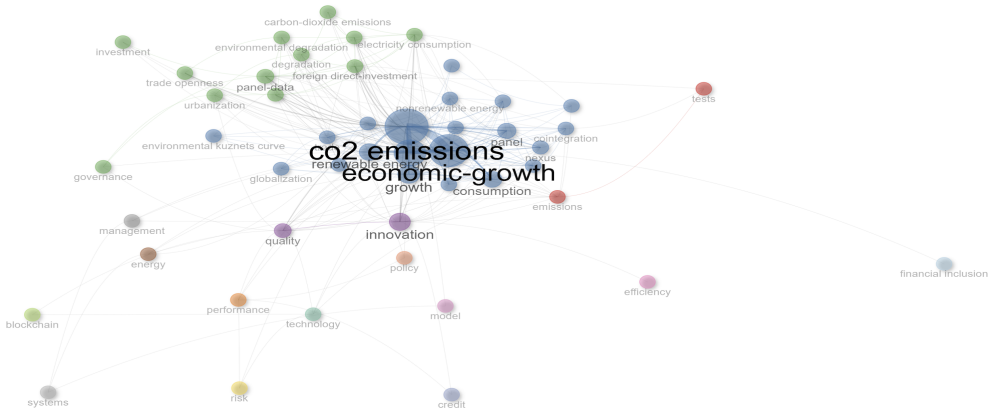
A major shift is observed during the 2022–2024 period, when the frequency of all terms increases dramatically. *CO2 emissions* become the most frequent term in 2024 (49 occurrences), reflecting the dominant concern of researchers with reducing carbon emissions. *Economic-growth* (48 occurrences) and *impact* (38 occurrences) highlight the focus on the relationship between fintech, sustainable economic growth, and environmental effects.

Terms like *innovation* (27 occurrences), *consumption* (21 occurrences), and *renewable energy* (18 occurrences) indicate a diversification of themes, focusing on new technologies, changes in consumption behaviors, and the transition to clean energy sources. The use of terms such as *panel* and *panel-data* (17 and 15 occurrences, respectively) show a consolidation of quantitative methodological approaches, emphasizing that the research is supported by rigorous analyses.

In conclusion, the analysis of word frequency over time demonstrates the evolution of the field from limited interest to a broad and sophisticated exploration of the

links between fintech, innovation, and sustainability. The dramatic increase in terms like *CO2 emissions* and *economic-growth* in recent years reflects a continuously expanding academic interest and the growing relevance of these topics in the context of climate change.

Figure 12. Co-occurrence Network



Source: Authors` own processing using the Biblioshiny application

The co-occurrence network figure illustrates the conceptual structure of the field, with major terms organized into interconnected clusters. Larger and more central nodes, such as *CO2 emissions* and *economic-growth*, indicate their fundamental importance in the literature. These terms act as nodal points linking various themes, emphasizing their central role in understanding the connection between fintech and climate issues.

The central cluster, formed around the terms *CO2 emissions*, *economic-growth*, *renewable energy*, and *growth*, reflects the main themes of the research. Their high frequency and multiple connections with other terms suggest that the research focuses on the relationship between CO2 emissions, economic development, and the transition to renewable energy sources. Terms such as *consumption*, *impact*, and *panel-data* contribute to the diversification of analyzed topics, highlighting the use of quantitative methodologies to study these phenomena.

The term *innovation*, situated in a slightly separate area, indicates a cluster related to the role of technological innovation. Its connections to central terms suggest that innovation is considered a crucial driver for solving climate issues through fintech.

Terms such as *panel-data*, *foreign direct investment*, and *electricity consumption* indicate the presence of a secondary cluster reflecting the use of empirical data and the relationship between investments, energy consumption, and climate impact. This cluster suggests a focus on applied studies and economic analyses.

Peripheral terms, such as *blockchain*, *financial inclusion*, and *policy*, point to emerging research directions. These highlight interest in specific technologies and regulatory frameworks, which are still in the early stages within this field.

The multiple links between terms demonstrate a high degree of interdependence among themes and suggest an interdisciplinary approach. The figure indicates that the field is well-structured around a few key concepts but continues to expand to include new research directions. In conclusion, the network reflects a mature and evolving field, with

a clear focus on carbon emissions, economic growth, and innovation, but with significant potential for growth in emerging areas such as blockchain and financial inclusion.

Conclusions

FinTech has emerged as a critical tool in addressing climate challenges, offering innovative solutions for financing green projects, reducing carbon emissions, and embedding sustainability principles into the global economy. The bibliometric analysis presented in this study underscores an exponential growth in academic interest in the intersection of FinTech and climate issues, highlighting its potential to contribute to sustainable development goals.

One of the major advantages of FinTech lies in its ability to support renewable energy projects through crowdfunding and other innovative financing methods. Additionally, blockchain technologies play a pivotal role in carbon trading, providing a transparent and efficient framework for reducing global emissions. By integrating ESG data into decision-making processes, investments become more responsible, further advancing the transition to a green economy.

The findings of this study reveal a significant increase in global academic engagement with this topic, as evidenced by the bibliometric analysis. The sharp rise in annual publications, with a growth rate of 61.6%, reflects a burgeoning recognition of the importance of FinTech in climate action. Contributions from countries such as China, India, and the European Union demonstrate a wide geographical spread of research efforts, emphasizing the global relevance of this emerging field.

Moreover, the analysis highlights the diversification of themes within the literature, spanning areas such as carbon markets, renewable energy investments, and sustainable finance. This thematic breadth reflects the interdisciplinary nature of the research and underscores FinTech's capacity to address complex climate challenges from multiple angles.

However, challenges persist, particularly in regulatory frameworks and financial inclusion. Policymakers must adapt regulations to foster technological innovation while safeguarding user protection and reducing inequalities. Furthermore, collaboration across disciplines and sectors remains essential to maximize FinTech’s impact on climate solutions.

In conclusion, the literature indicates that interest in the intersection of FinTech and climate issues has grown significantly, positioning FinTech not only as a technological innovation but as a vital enabler of global sustainability efforts. Future research should prioritize integrated and interdisciplinary approaches to accelerate the adoption of sustainable solutions on a global scale.

Authors' Contributions:

The authors contributed equally to this work.

References:

Addy, W., Ofodile, O., Adeoye, O., Oyewole, A., Okoye, C., Odeyemi, O., & Ololade, Y. (2024). Data-Driven Sustainability: How Fintech Innovations Are Supporting Green Finance. *Engineering Science & Technology Journal*.

Ashta, A. (2023). How Can Fintech Companies Get Involved in the Environment?. *Sustainability*.

Elias, O., Awotunde, O., Oladepo, O., Azuikpe, P., Samson, O., Oladele, O., & Ogunruku, O. (2024). The evolution of green fintech: Leveraging AI and IoT for sustainable financial services and smart contract implementation. *World Journal of Advanced Research and Reviews*.

Mhlanga, D. (2022). The role of financial inclusion and FinTech in addressing climate-related challenges in the industry 4.0: Lessons for sustainable development goals. *Frontiers in Climate.*

Ugochukwu, C., Ofodile, O., Okoye, C., & Akinrinola, O. (2024). Sustainable Smart Cities: The Role of Fintech in Promoting Environmental Sustainability. *Engineering Science & Technology Journal*.

Wen, H., & Liu, Y. (2023). Can Fintech Lead to the Collaborative Reduction in Pollution Discharges and Carbon Emissions?. *Sustainability*.

www.bibliometrix.org

www.webofscience.com

Acknowledgement

This work was supported by a grant from the Romanian Ministry of Research, Innovation and Digitalization, the project with the title „Economics and Policy Options for Climate Change Risk and Global Environmental Governance" (CF 193/28.11.2022, Funding Contract no. 760078/23.05.2023), within Romania's National Recovery and Resilience Plan (PNRR) - Pillar III, Component C9, Investment I8 (PNRR/2022/C9/MCID/I8) - Development of a program to attract highly specialised human resources from abroad in research, development and innovation activities.

Article Info

Received: March 26 2025
Accepted: May 24 2025

How to cite this article:
Spulbar, A. C., Trasca, O. M. (2025). Unveiling The Growing Role of Fintech in Tackling Climate Challenges. A Bibliometric Analysis. *Revista de Științe Politice. Revue des Sciences Politiques,* no. 86, pp. 225 – 241.