SEVEN
publicações acadêmicas

Green, climate and sustainable finance: A bibliometric analysis

https://doi.org/10.56238/Connexpemultidisdevolpfut-127

Michel Becker
(PPGAdm-UFSC);
E-mail: michelfpolis@gmail.com

Marcus Vinicius Andrade de Lima
(PPGAdm-UFSC);
E-mail: marcus.lima@ufsc.br

Juliana Baldessar Webber
(PPGC-UFSC);
E-mail: jubweber@gmail.com

ABSTRACT
Climate change has imposed challenges that have become a priority, and finance, which plays a key role in the economy, can adapt and incorporate devices to assist in this confrontation. In this environment, sustainable, climate and green finance compose emerging themes, with growing interest by researchers, not having consensus on their definitions, making it fundamental to understand and analyze the related scientific production. The article aimed to expand the understanding of these themes through a bibliometric study, pointing out authors, journals, keywords and relevant articles. The research highlighted authors J. Timmons Roberts and Farhad Taghizadeh-Hesary, as well as the journals Journal of Sustainable Finance, Investment; Climate Policy; and Sustainability, as the most prolific and presented a set of articles and keywords that may subsidize future work.

Keywords: Green finance. Sustainable finance. Climate finance. bibliometric analysis. Cobragen.

1 INTRODUCTION

Climate change is the current challenge and, if there is no quick action, we will compromise future development capacity. It is imperative that considerable innovations, across diverse sectors and business models, reduce the carbon footprint in order to mitigate the worst impacts of these changes(Lenox & Duff, 2021).

In October/21, after assessments that climate targets were compromised, jeopardizing the Paris Agreement, COP26 focused global attention on a key target: limiting global temperature rise to 1.5°C, halving global emissions by 2030 (Mendiluce, 2022; Streck et al., 2016). This scenario has caused companies around the world to undergo unprecedented charges to take quick and far-reaching action to meet the climate goals set, making them an absolute priority (Mendiluce, 2022).

Companies and financial actors play a key role in the global economy, through their influence on extractive economic activities and changes in biomes, interfering with climate stability (Galaz et al., 2018). Thus, influencing capital allocation decisions is one of the best ways to promote the much-needed transition to a new economy. Then comes the time for sustainable finance (Daniel Ricas & Baccas, 2022).

Sustainable finance is considered the future in finance and investment, supporting the global

fight against climate change and its impacts(Zhang et al., 2019). It is established in a format in which it can effectively allocate financial resources and guide the flow of capital, through green financial products such as green credit, green bonds, green insurance, green investment and carbon financing, promoting the transformation of economic structures and optimizing the relationship between environment and economy(Daniel Ricas & Baccas, 2022).

Given the emergence of sustainable finance, the scientific community has shown an exponential interest in the subject in recent years, according to **Figure 3**, making it opportune to establish an adequate understanding of conceptual issues, generate knowledge with scientific recognition and in a systematized way, to subsidize future research on an important and developing subject(Lagoarde-Segot, 2019; Yu et al., 2021; Zhang et al., 2019).

Thus, this article aims to expand the understanding of green, climate and sustainable finance, especially by:

I. Select bibliographic references on green finance, climate finance and sustainable finance; and
II. Perform bibliometric analyses on selected articles.

To achieve these objectives, a systematic, bibliometric study was adopted, considering an effective method to offer an in-depth and comprehensive understanding of emerging research areas(Yu et al., 2021). The concept of bibliometric analysis, popularized by Pritchard (1969), consists of a set of methods and techniques for information visualization, with the purpose of elaborating maps that can adequately represent the quantitative and cognitive aspects of science. The observable parameters in this research are: chronology of publications, most recurrent keywords, and highlighting of articles, authors and prominent journals on this topic.

With increased attention to global climate challenges, expositions on how to achieve and finance goals related to the Paris Agreement and the UN Sustainable Development Goals, it has been at the forefront of international discussions, and sustainability in finance is affiliated with these most prominent motivating factors of the climate agenda(Clark et al., 2018).

Although there are other reviews that contemplate fragments contained in this study, it is essential to admit that the researcher's lenses influence the object analyzed, the decisions of terms and bases used, making the result unique(Ensslin et al., 2017). No research was found that addressed in an integrated way the terms green finance, climate finance and sustainable finance, made from multiple databases, allowing to generate an integrated knowledge of the subject.

The remainder of this article is structured as follows: section 2 contains the theoretical foundation; Section 3 shows the methodological process, with the procedures used in this research; section 4 describes the analyses and bibliometric results; Conclusions and notes are in section 5; and the last section is devoted to bibliographic references.

1.1 THEORETICAL REFERENCE

1.1.1 Sustainable Finance

According to Guimarães (2022), one of the bases of support for a green economy is the financial sector, through sustainable finance. This stimulates a new approach to be developed and explored by all market actors and can be defined as "*finance that incorporates both climate, environmental and social aspects as well as broader considerations about the long-term economic sustainability of funded organizations and the stability of the financial system in general*"(Guimaraes, 2022).

For the German agency Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), sustainable finance can be understood as the union of some factors such as "*sustainability aspects in the decision-making processes of financial market actors, in financial market policies and in institutional and market arrangements that contribute to the achievement of strong, sustainable, balanced and inclusive growth*"(Daniel Ricas & Baccas, 2022). In business, finance and sustainability connect finance and investment practices to ESG(Barua & Chiesa, 2019), and the shareholder wealth maximization approach has been challenged by sustainable wealth creation(Fatemi & Fooladi, 2013).

Therefore, because it is a comprehensive concept(Debrah et al., 2022), sustainable finance ends up encompassing both climate finance and green finance, each of which is conceived and focused on specific instruments, which are often integrated, as can be seen in the following breakdown.

1.1.2 Climate Finance

Climate finance is defined by the United Nations Framework Convention on Climate Change as "*local, national or transnational financing – from public, private and alternative financing sources – that seeks to support mitigation and adaptation actions that will address climate change*", demanding financial support from the Parties with the most financial resources, to the most vulnerable(UNFCCC, 2021; UNFCCC, 2022). These are investments required from households, businesses and government to implement a low-carbon economy transition, reducing greenhouse gas concentration levels and building the resilience of nations(Hong et al., 2020).

Seeking to achieve better climate change mitigation and adaptation outcomes, the United Nations, through of its financial operators, it chose eight areas to centralize the performance of the Climate Fund: generation and access to energy; transport; buildings, cities; industries and electronics; forests and land use; livelihoods and communities; food and water health and safety; infrastructure and built environment; and ecosystems and ecosystem services(GCF, 2022).

A significant portion of the academic literature on climate finance focuses on reporting existing climate finance flows and articulating options for expanding financing, other authors have advocated a broadening of the scope, addressing sustainable development more holistically(Steckel et al., 2017).

1.1.3 Green Finance

Green finance is a strategic approach to incorporate the financial sector into the process of low-carbon transformation and optimize resources in the face of adaptation to climate change(Soundarrajan & Vivek, 2016). It has a broad concept, trying to promote environmentally responsible investments, carbon finance, and climate finance, making it fundamental to achieving the Paris Agreement, the Sustainable Development Goals(Debrah et al., 2022), and climate-resilient infrastructure(Taghizadeh-Hesary & Yoshino, 2019).

It functions as a new financial instrument, proposed to solve environmental problems, while maintaining the main characteristics of traditional finance(Zhou et al., 2020). Green finance products are divided into four major groups: retail finance bonds; asset management; corporate finance; and insurance(Soundarrajan & Vivek, 2016).

Essentially, with the backing of environmental protection, green finance sets out to provide investments, financing, operating funds and other financial resources for environmentally friendly projects(Abbas et al., 2021).

2 METHODOLOGY

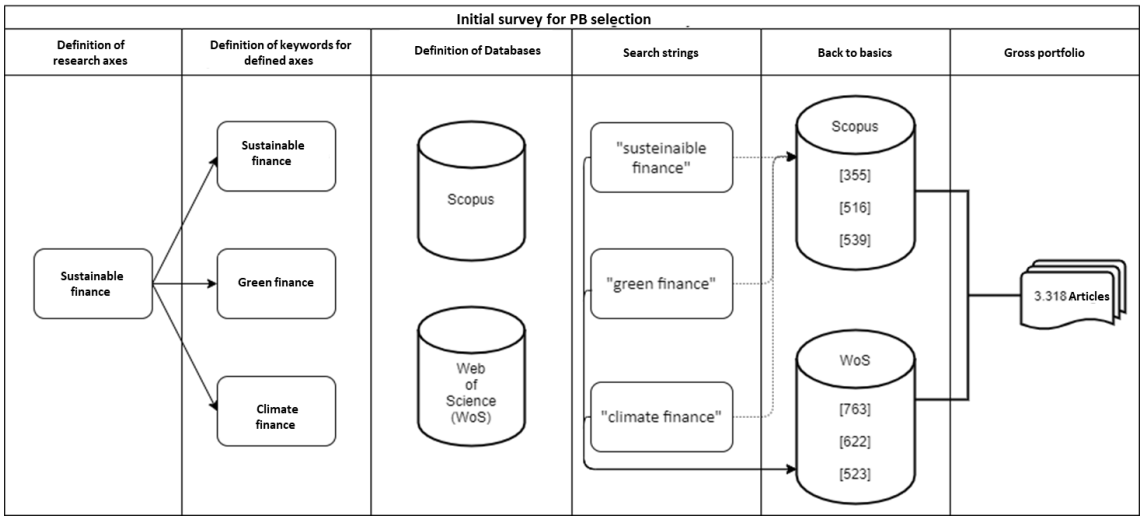
The method used in this article is a bibliometric analysis approach. It was first used in 1969 by Alan Pritchard and has gained wide popularity to aid quantitative and objective analysis in understanding the literature, and is often used to systematize thes information in a particular thematic field(Pritchard, 1969).

The procedures described in this study were conducted in August 2022 and only articles and reviews indexed to the selected databases were searched.

Two scientific databases were defined: Scopus and Web of Science. Both are considered relevant exponents in the international scientific community, in addition to offering search possibilities and advanced filters, such as the use of Boolean expressions. Because of this, the authors understand that the selected bases are adequate for the proposal of this research.

The main terms of this study, i.e. green finance, climate finance and sustainable finance, have been transformed into the *strings* of search "*green finance*", "*climate finance*" and "*susteinable finance*", which subsidized the search in the selected databases. The details of this process can be viewed in the **Figure 1**.

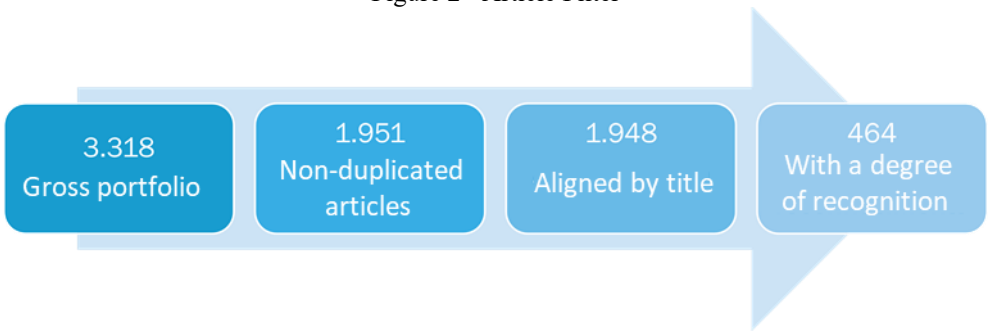
Figure 1 -Gross Portfolio selection process



As a result of this stage, 3,318 articles were obtained, which became part of the raw article database.

With the help of the EndNote20 software, the next step was the identification and exclusion of duplicate articles, resulting in the elimination of 1,361 references. In the remaining 1,951 documents, the titles of the articles were read to eliminate those misaligned with the research axes initially defined, resulting in 1,948 articles. The process with all the steps of filtering the articles of the raw bibliographic portfolio is illustrated in the **Figure 2**.

Figure 2 - Article Filter



The next step included the analysis of the scientific recognition of the 1948 articles, based on the number of citations of each one, with the help of the online tool identified by Google Scholar (Google, 2022) and with the support *of the* Zotero software. These articles were classified in descending order, allowing the identification of the most relevant ones. The authors of this research adopted the indicator of 80% of the volume of citations for the cutoff value, which corresponds to 464 most cited articles.

From the filters presented and with the support of some *software* such as MSExcel and VOSvier, bibliometric analyses were performed in different stages, which supported the results of this research.

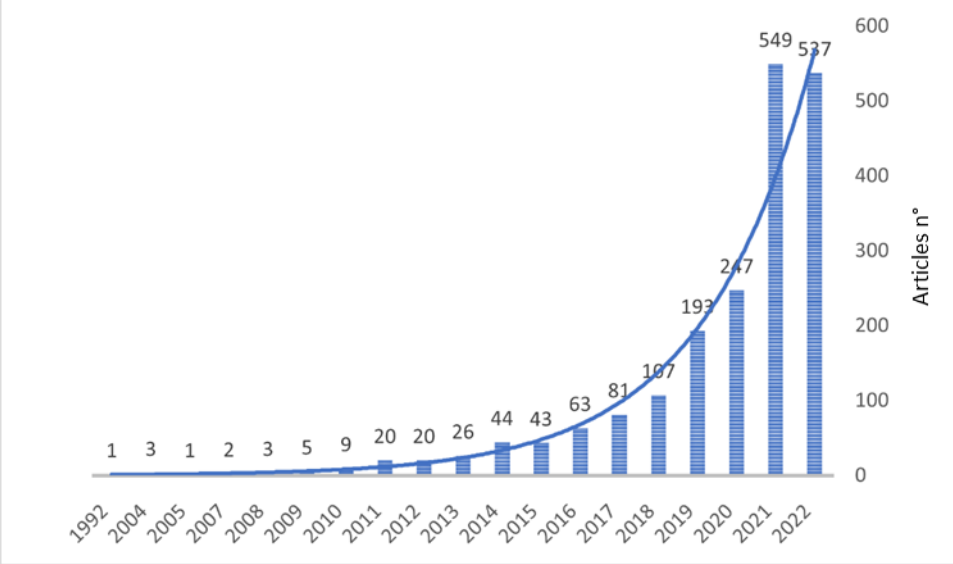
3 FINDINGS

First, by identifying that most of the publications were carried out in the last two years, more precisely in the last 20 months, it was defined that the bibliometric analyses will be presented in two blocks: A and B. The first, carried out in an expanded portfolio of 1,948 articles, disregarding the elimination by number of citations. In the second block, only the 464 articles in the final portfolio are evaluated.

3.1 A – ANNUAL PUBLICATIONS

Observing the distribution of the annual publications of the theme addressed, it is denoted that the beginning is relatively recent, having a first publication in 1992, resuming only after 12 years, in 2004. Recently publications have increased exponentially, as presented in the **Figure 3**, with more than 50% of them occurring in the last two years, 2021 and 2022. The trend shows that studies in this area have had a regular growth and that the research area has been receiving more academic attention. Also, in 2022, It will be possible to observe the largest number of publications on the subject.

Figure 3 - Timeline of publications



3.2 A - AUTHORS

A **Table 1** presents the 11 authors with the highest number of publications. Of the 4,538 authors who had their work indexed and selected in this study, the most prolific researchers were Yun Wang of Zhejiang Gongshang University in China and Farhad Taghizadeh-Hesary of Zhejiang Gongshang University in China. *Social Science Research Institute*, Tokai University, Japan, both with 14 selected articles.

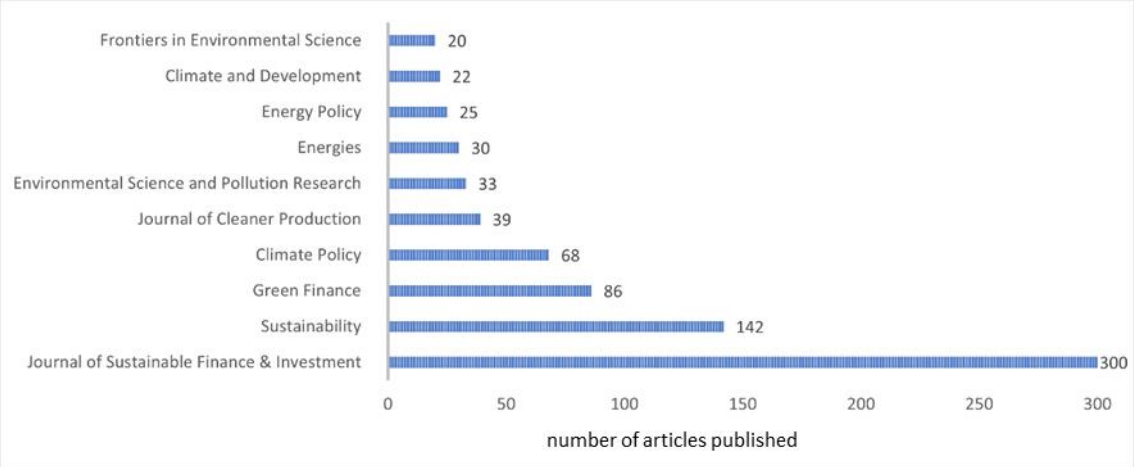
Table 1 Authors with the largest publications

1°	Wang, And.	14
1°	Taghizadeh-Hesary, F.	14
2°	Steffen, B.	13
3°	Polzin, F.	12
4°	Roberts, J. T.	10
4°	Schmidt, T. S.	10
5°	Shrimali, G.	9
5°	Gollier, C.	9
5°	Miciula, I.	9
5°	Volz, U.	9
5°	Hoepner, A. G. F.	9

3.3 A - NEWSPAPERS

A **Figure 4** shows the ten most cited journals by the selected articles. First on the list is the *Journal of Sustainable Finance & Investment* with 300 articles, followed by the *Sustainability* with 142, and *Green Finance* with 86. It was also found the thematic multidisciplinarity, with studies gathered in several areas such as business and economics, finance and investments, energy, policies, environment.

Figure 4 Periodicals with the highest number of publications



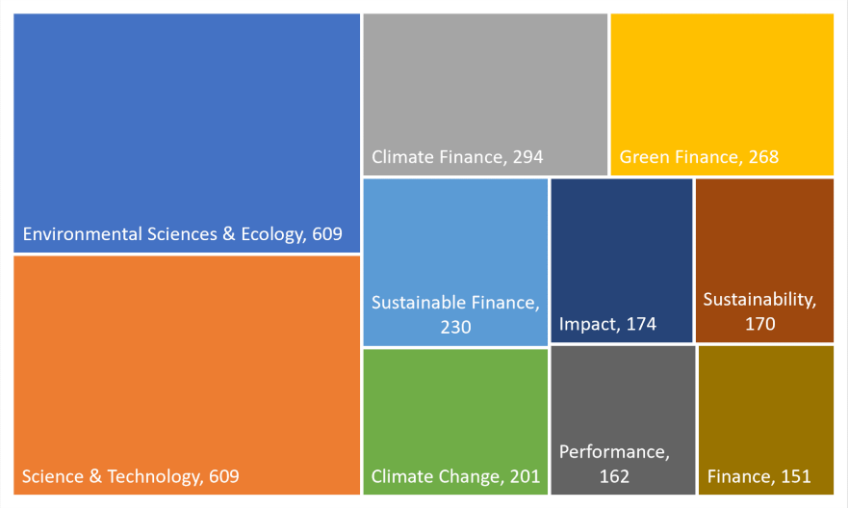
3.4 A – KEYWORDS

Keywords indicate the main content of a published research and portray the scope of the research area within a domain, contributing to the identification of the main areas of research(Debrah et al., 2022). Like this, we analyze the most cited words, as well as their co-occurrence network.

Among the 20,582 keywords mentioned in the articles evaluated, the terms "Environmental sciences and ecology" and "science and technology" emerge among the most cited, followed by climate

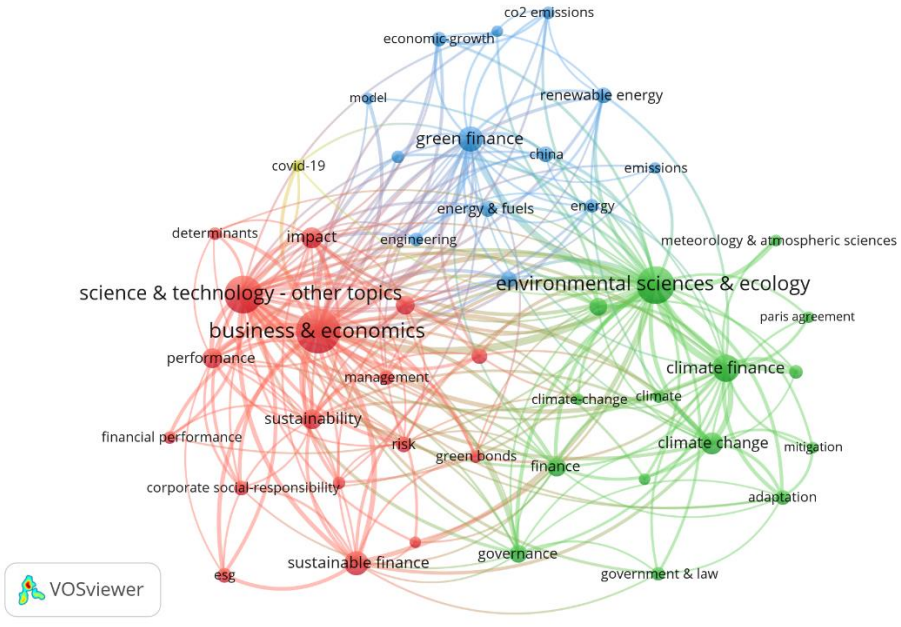
finance, green finance and sustainable finance, the latter being the ones that guided this research, as can be seen in the **Figure 5**.

Figure 5 Most frequent keywords



To contribute to the identification of the main research areas, the VOSviewer software was used to create a network of co-occurrence of keywords, where we can observe the influence and relationship between the main terms, as **Figure 6**.

Figure 6 Co-occurrences Main from Keywords



In order to improve the identification of the articles highlighted in the context of this research, their respective authors, and journals in which they were published, we reanalyzed the 464 most cited articles in the portfolio, whose results are presented below.

3.5 B – CITATION FACTOR

The number and frequency of citations of an article provides a useful measure of its scientific influence and impact(Debrah et al., 2022). A **Table 2** presents a ranking of the most cited articles in this study, containing all documents with more than 200 citations.

Table 2- Most cited articles

Environmental Externalities and Cost of Capital	(Chava, 2014)	741
Socially responsible funds and market crises	(Nofsinger & Varma, 2014)	579
Do Investors Value Sustainability? A Natural Experiment Examining Ranking and Fund Flows	(Hartzmark & Sussman, 2019)	547
Country-level institutions, firm value, and the role of corporate social responsibility initiatives	(El Ghoul et al., 2017)	428
Resiliency of Environmental and Social Stocks: An Analysis of the Exogenous COVID-19 Market Crash	(Albuquerque et al., 2020)	410
Hedging Climate Change News	(Engle et al., 2020)	369
The Influence of Firm Size on the ESG Score: Corporate Sustainability Ratings Under Review	(Drempetic et al., 2020)	293
The way to induce private participation in green finance and investment	(Taghizadeh-Hesary & Yoshino, 2019)	281
Attention to Global Warming	(Choi et al., 2020)	266
Sustainable business model archetypes for the banking industry	(Yip & Bocken, 2018)	262
Bonus Culture: Competitive Pay, Screening, and Multitasking	(Benabou & Tirole, 2016)	255
Does Climate Change Affect Real Estate Prices? Only If You Believe In It	(Baldauf et al., 2020)	250
Equitable mitigation to achieve the Paris Agreement goals	(Robiou du Pont et al., 2017)	239
The green bond market: a potential source of climate finance for developing countries	(Wave, 2019)	233
Climate-smart agriculture global research agenda: Scientific basis for action	(Steenwerth et al., 2014)	216
Financing renewable energy in Africa - Key challenge of the sustainable development goals	(Schwerhoff & She, 2017)	215

3.6 B – AUTHORS OF THE MOST CITED ARTICLES

The list of authors with more than 5 publications is available in the **Table 3**. Researcher J. Timmons Roberts, from the Climate and Development Laboratory, Institute for Environment and Society, Brown University, USA, stands out with 10 selected articles, followed by FarhadTaghizadeh-Hesary with 8 articles.

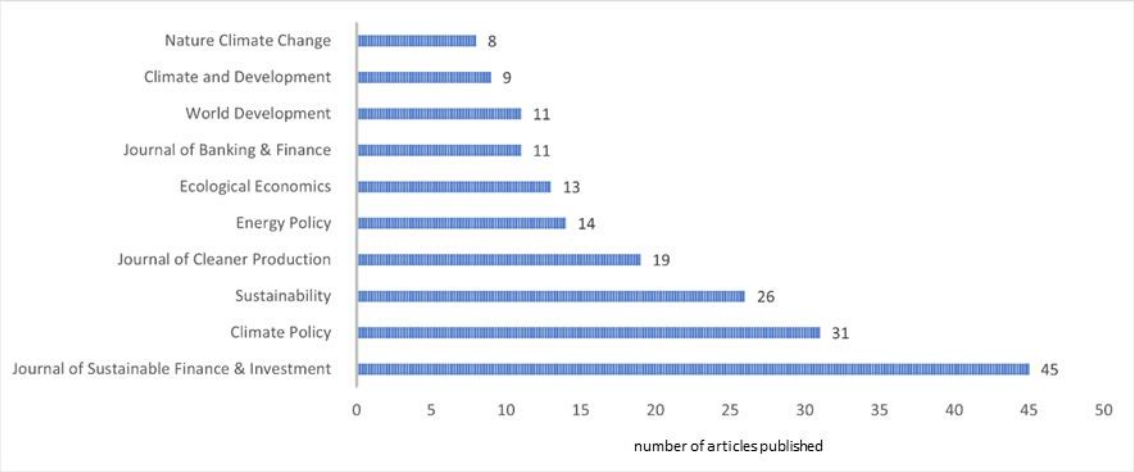
Table 3 - Most prolific researcherss

1°	**Roberts, J. T.**	10
2°	**Taghizadeh-Hesary, F.**	8
3°	Crifo, P.	6
3°	Volz, U.	6
4°	Monastery, I.	5
4°	Weikmans, R.	5
4°	**Polzin, F.**	5
4°	Stadelmann, M.	5

3.7 B – JOURNALS OF THE MOST CITED ARTICLES

A **Figure 7** shows the ten journals of the most cited articles. Again, at the top of the list is the *Journal of Sustainable Finance & Investment,* with 45 articles, followed by *Climate Policy* with 31, and the *Sustainability* With 26, all of these have their scope focused on sustainability.

Figure 7 - Journals with the highest number of articles



Although prominent journals, mainly in the field of sustainability, were evidenced in the study, it is observed that important journals, whose focus is equivalent to the theme of this research, finance, were not highlighted. For Hong et al. (2020) financial economists are lagging behind on the topic of sustainable finance and there are many important issues for which they are naturally able to assess "*We are confident that the involvement of the broader academic financial community in these issues will undoubtedly lead to valuable contributions to improving the utility of the financial field*."

3 CONCLUSION

Finance, whether called climate, sustainable or green, emerges as an innovative and beneficial financial tool for the confrontation and fulfillment of the established climate goals, favoring measures to mitigate the impacts of global warming. The theme was on the rise, indicating a trend of growth and interest of the international scientific community and this work proposed, through indicators and bibliometric analysis, to broaden the understanding on the subject, offering *insights* into trends in

publication and citation and the most prolific authors. Authors J. Timmons Roberts and FarhadTaghizadeh-Hesary, and the journals *Journal of Sustainable Finance, Investment; Climate Policy;* and *Sustainability*.

A set of articles with scientific recognition was presented, providing support for future studies. We also observed, as well as Zhang et al. (2019), a limited number of publications on the subject in the main journals of economics and finance, this may present an opportunity to reconcile focus for future research. The analyses were limited to articles indexed in the *Scopus* and *Web of Science databases*.

REFERENCES

Abbas, M. G., Wang, Z. Q., Bashir, S., Iqbal, W., & Ullah, H. (2021). Nexus between energy policy and environmental performance in China: The moderating role of green finance adopted firms [Article]. Environmental Science and Pollution Research, 28(44), 63263-63277. https://doi.org/10.1007/s11356-021-15195-5

Albuquerque, R., Koskinen, Y., Yang, S., & Zhang, C. D. (2020). Resiliency of Environmental and Social Stocks: An Analysis of the Exogenous COVID-19 Market Crash. Review of Corporate Finance Studies, 9, 593-621. https://doi.org/10.1093/rcfs/cfaa011

Baldauf, M., Garlappi, L., & Yannelis, C. (2020). Does Climate Change Affect Real Estate Prices? Only If You Believe In It. Review of Financial Studies, 33, 1256-1295. https://doi.org/10.1093/rfs/hhz073

Banga, J. (2019). The green bond market: a potential source of climate finance for developing countries. Journal of Sustainable Finance & Investment, 9, 17-32. https://doi.org/10.1080/20430795.2018.1498617

Barua, S., & Chiesa, M. (2019). Sustainable financing practices through green bonds: What affects the funding size? [Article]. Business Strategy and the Environment, 28(6), 1131-1147. https://doi.org/10.1002/bse.2307

Benabou, R., & Tirole, J. (2016). Bonus Culture: Competitive Pay, Screening, and Multitasking. Journal of Political Economy, 124, 305-370. https://doi.org/10.1086/684853

Chava, S. (2014). Environmental Externalities and Cost of Capital. Management Science, 60, 2223-2247. https://doi.org/10.1287/mnsc.2013.1863

Choi, D., Gao, Z. Y., & Jiang, W. X. (2020). Attention to Global Warming. Review of Financial Studies, 33, 1112-1145. https://doi.org/10.1093/rfs/hhz086

Clark, R., Reed, J., & Sunderland, T. (2018). Bridging funding gaps for climate and sustainable development: Pitfalls, progress and potential of private finance [Article]. Land Use Policy, 71, 335-346. https://doi.org/10.1016/j.landusepol.2017.12.013

Daniel Ricas, D., & Baccas, D. (2022). Taxonomia em Finanças Sustentáveis: panorama e realidade nacional. https://labinovacaofinanceira.com/wp-content/uploads/2021/04/Taxonomia-em-finan%C3%A7as-sustent%C3%A1veis-Panorama-e-Realidade-Nacional.pdf

Debrah, C., Darko, A., & Chan, A. P. C. (2022). A bibliometric-qualitative literature review of green finance gap and future research directions. Climate and Development, 1-24. https://doi.org/10.1080/17565529.2022.2095331

Drempetic, S., Klein, C., & Zwergel, B. (2020). The Influence of Firm Size on the ESG Score: Corporate Sustainability Ratings Under Review. Journal of Business Ethics, 167, 333-360. https://doi.org/10.1007/s10551-019-04164-1

El Ghoul, S., Guedhami, O., & Kim, Y. (2017). Country-level institutions, firm value, and the role of corporate social responsibility initiatives. Journal of International Business Studies, 48, 360-385. https://doi.org/10.1057/jibs.2016.4

Engle, R. F., Giglio, S., Kelly, B., Lee, H., & Stroebel, J. (2020). Hedging Climate Change News. Review of Financial Studies, 33, 1184-1216. https://doi.org/10.1093/rfs/hhz072

Ensslin, L., Ensslin, S. R., Dutra, A., Nunes, N. A., & Reis, C. (2017). BPM governance: a literature analysis of performance evaluation. Business Process Management Journal, 23(1), 71-86. https://doi.org/10.1108/BPMJ-11-2015-0159

Fatemi, A. M., & Fooladi, I. J. (2013). Sustainable finance: A new paradigm [Article]. Global Finance Journal, 24(2), 101-113. https://doi.org/10.1016/j.gfj.2013.07.006

Galaz, V., Crona, B., Dauriach, A., Scholtens, B., & Steffen, W. (2018). Finance and the Earth system – Exploring the links between financial actors and non-linear changes in the climate system [Article]. Global Environmental Change, 53, 296-302. https://doi.org/10.1016/j.gloenvcha.2018.09.008
GCF, G. C. F. (2022). ANNUAL RESULTS REPORT 2021. https://www.greenclimate.fund/

Guimarães, G. C. P. (2022). Finanças sustentáveis: análise entre a taxonomia da União Europeia e a taxonomia verde da Febraban Escola Brasileira de Administração Pública e de Empresas. FGV]. Rio de Janeiro. https://bibliotecadigital.fgv.br/dspace/handle/10438/32184
Hartzmark, S. M., & Sussman, A. B. (2019). Do Investors Value Sustainability? A Natural Experiment Examining Ranking and Fund Flows. Journal of Finance, 74, 2789-2837. https://doi.org/10.1111/jofi.12841

Hong, H., Karolyi, G. A., & Scheinkman, J. A. (2020). Climate Finance [Article]. Review of Financial Studies, 33(3), 1011-1023. https://doi.org/10.1093/rfs/hhz146

Lagoarde-Segot, T. (2019). Sustainable finance. A critical realist perspective [Article]. Research in International Business and Finance, 47, 1-9. https://doi.org/10.1016/j.ribaf.2018.04.010

Lenox, M., & Duff, R. (2021). The Decarbonization Imperative: Transforming the Global Economy by 2050. Stanford University Press.

Mendiluce, M. (2022). Setting Science-Based Targets to Combat Climate Change. Harvard Business Review. https://hbr.org/2022/02/setting-science-based-targets-to-combat-climate-change

Nofsinger, J., & Varma, A. (2014). Socially responsible funds and market crises. Journal of Banking & Finance, 48, 180-193. https://doi.org/10.1016/j.jbankfin.2013.12.016

Pritchard, A. (1969). Statistical Bibliography; An Interim Bibliography.

Robiou du Pont, Y., Jeffery, M. L., Gutschow, J., Rogelj, J., Christoff, P., & Meinshausen, M. (2017). Equitable mitigation to achieve the Paris Agreement goals. Nature Climate Change, 7, 1-+. https://doi.org/10.1038/nclimate3186

Schwerhoff, G., & Sy, M. (2017). Financing renewable energy in Africa - Key challenge of the sustainable development goals. Renewable & Sustainable Energy Reviews, 75, 393-401. https://doi.org/10.1016/j.rser.2016.11.004

Soundarrajan, P., & Vivek, N. (2016). Green finance for sustainable green economic growth in India [Article]. Agricultural Economics-Zemedelska Ekonomika, 62(1), 35-44. https://doi.org/10.17221/174/2014-agricecon

Steckel, J. C., Jakob, M., Flachsland, C., Kornek, U., Lessmann, K., & Edenhofer, O. (2017). From climate finance toward sustainable development finance [Article]. Wiley Interdisciplinary Reviews-Climate Change, 8(1), 8, Article e437. https://doi.org/10.1002/wcc.437

Steenwerth, K. L., Hodson, A. K., Bloom, A. J., Carter, M. R., Cattaneo, A., Chartres, C. J., Hatfield, J. L., Henry, K., Hopmans, J. W., Horwath, W. R., Jenkins, B. M., Kebreab, E., Leemans, R., Lipper, L., Lubell, M. N., Msangi, S., Prabhu, R., Reynolds, M. P., Sandoval Solis, S., . . . Jackson, L. E. (2014). Climate-smart agriculture global research agenda: Scientific basis for action. Agriculture and Food Security, 3. https://doi.org/10.1186/2048-7010-3-11

Streck, C., Keenlyside, P., & Von Unger, M. (2016). The Paris agreement: A new beginning [Review]. Journal for European Environmental and Planning Law, 13(1), 3-29. https://doi.org/10.1163/18760104-01301002

Taghizadeh-Hesary, F., & Yoshino, N. (2019). The way to induce private participation in green finance and investment. Finance Research Letters, 31, 98-103. https://doi.org/10.1016/j.frl.2019.04.016
UNFCCC. (2021). Convenção-Quadro das Nações Unidas de 2022 sobre Mudanças Climáticas. https://unfccc.int/topics/climate-finance/the-big-picture/introduction-to-climate-finance
UNFCCC, t. K. P. a. t. P. A. (2022). UNITED NATIONS CLIMATE CHANGE ANNUAL REPORT 2021. https://unfccc.int/Yip, A. W. H., & Bocken, N. M. P. (2018). Sustainable business model archetypes for the banking industry. Journal of Cleaner Production, 174, 150-169. https://doi.org/10.1016/j.jclepro.2017.10.190

Yu, X. B., Mao, Y., Huang, D. M., Sun, Z. B., & Li, T. L. (2021). Mapping Global Research on Green Finance from 1989 to 2020: A Bibliometric Study [Review]. Advances in Civil Engineering, 2021, 13, Article 9934004. https://doi.org/10.1155/2021/9934004

Zhang, D. Y., Zhang, Z. W., & Managi, S. (2019). A bibliometric analysis on green finance: Current status, development, and future directions [Article]. Finance Research Letters, 29, 425-430. https://doi.org/10.1016/j.frl.2019.02.003

Zhou, X., Tang, X., & Zhang, R. (2020). Impact of green finance on economic development and environmental quality: a study based on provincial panel data from China. Environmental Science and Pollution Research, 27(16), 19915-19932. https://doi.org/10.1007/s11356-020-08383-2