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Research Article

Bibliometric Analysis: Publication Trends of Forest and Land Fire Policy 1969-2024

Ahmet Vahlevi[1], Aulia Utami Putri[1]*, Indah Mawardika[2]

[1]Fakultas Ilmu Sosial dan Ilmu Politik, Universitas Sriwijaya, Indonesia
[2]Sekolah Tinggi Pertanahan Nasional, Yogyakarta

ORCID
Aulia Utami Putri: https://orcid.org/0000-0001-5739-036X

Abstract.

This study aims to analyze publication trends related to the themes of Butane and land fire policies indexed in the Scopus database from 1969 to 2024. Journal articles in the field of *forest and land fire policy* published between 1969 and 2024 are traced from the Scopus database using the keywords "Forest Fires" OR "*Land Fires*" AND "*Policy*". This study uses analysis of publication trends forest and land fire policy, most productive countries and most productive organizations*, co-authorship,* co- *and* citation*.* Research on forest and land fire policy is widely conducted around the world. This is because many problems must be solved by *multistakeholders*. Publications in 2022 became the most productive year with 215 publications. *The United States* and *Spain* are the two countries that are most productive in producing publications related to forest and land fire policies. The network of *co-authorship* based on documents is Stephens, SL being the most common. *Co-Occurrence* networks for *Author Keywords* include *forest fires, deforestation, forest management, wildfire, remote sensing, wildfires, landsat, protected areas.* Bibliometric methods can be used to analyze publication trends related to *"forest and land fire policy"*. However, it needs the support of datasets and a complete computing system. The results of the analysis of forest and land fire policy articles show an increase in publication trends related to forest and land fire policies.

Keywords: bibliometric analysis, policy implementation, land fires, forest

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1. Introduction

Forest and land fires have become a major problem that negatively impacts the environment, public health, and economy. Fire suppression requires a holistic approach that encompasses a wide range of strategies and policies. Forest fires still occur despite policies and preventive measures. However, the company has also been subject to legal and administrative sanctions. Forest fires pose a major threat to ecologically growing forests and protect the environment, in addition to causing tragic deaths and loss of valuable natural and individual wealth, including thousands of hectares of forests and hundreds of homes. Every year, thousands of wildfires cause unquantifiable

and unexplained disasters around the world [1]. But forest burning still occurs. Sanctions include revocation of operating licenses, repair of blackout equipment, reporting responsibilities, and handover of burned land to the government [2]. Fire prevention policies in certain periods can lead to changes in the causes of forest fires [3]. In the last twenty years, forest fires in Indonesia seem to occur every year. As if the government is unable to handle this catastrophe [4]. Since 1969, forest and land fires have become an increasingly troubling global problem. This phenomenon has had far-reaching and serious impacts on the environment, economy, and human health around the world. Forest and land fires are often triggered by a variety of factors, including human activities, climate change, and unsustainable land management practices.

In the early 1970s, forest fires began to become a major concern of the international community due to their increasing frequency and intensity. Countries such as the United States, Australia, and countries in South America, such as Brazil and Indonesia, are in the limelight because they often experience widespread and destructive forest fires [5].

In the following decades, namely the 1980s and 1990s, the number of forest fires continued to increase significantly. In most areas, factors such as land clearing for agriculture, climate change, and illegal logging activities are the main triggers of forest fires [6]. Especially in tropical and subtropical regions, forest and land fires pose a serious threat to biodiversity and wildlife habitat [7].

At the beginning of the 21st century, awareness of the environmental impacts caused by forest fires is increasing [8]. The international community is beginning to recognize the importance of collaborative action in preventing, monitoring and reducing the risk of forest and land fires. Efforts to raise public awareness, develop more sophisticated monitoring technologies, and improve regulation of practices that can cause forest fires are global priorities.

However, despite these efforts, forest and land fires remain a serious threat today. In 2024, regions around the world are still experiencing a severe fire season, with devastating impacts on the environment, economy, and human health. Therefore, cross-border cooperation and stronger action are needed to effectively address these challenges and protect natural resources and human life in the future.

Forest fires pose a major threat to ecologically growing forests and protect the environment, in addition to causing tragic deaths and loss of valuable natural and individual wealth, including thousands of hectares of forests and hundreds of homes. Every year, thousands of forest fires cause disasters that cannot be counted and explained worldwide [9].

Public awareness operations, improved prevention technology, and software development are some of the measures taken to reduce fires. Instead, forest fire suppression efforts include the development of extinguishing technology, the implementation of extinguishing procedures (early extinguishing and advanced extinguishing), and rescue and evacuation. At the same time, post-fire management efforts are carried out through monitoring, assessment, and inventory of remaining forest fires, socialization, law enforcement, and rehabilitation. Various policy elements are discussed in this analysis. These include regulations on land burning, forest management, law enforcement, availability of resources, and community commitment to fire prevention and suppression. In addition, the study looked at how national and local policies interact with each other, as well as the role of other parties involved in fire suppression. Based on the description of the problem that has been explained by the researcher in this background, the researcher is interested in taking the title, "**Bilbiometric Analysis: Publication Trends of Forest and Land Fire Policy 1969-2024".**

2. Methods

The secondary data used in this research database were not obtained through direct observation, but were obtained from the results of previous research processes. Aticles related to the topic are obtained through the Scopus database.

Data Analysis and Visualization: Bibliometric analysis is created using the VOSviewer 1.6.15 program. Using Vosviewer, the analysis can be visualized and mapped by country, author, keywords, and research topic. Furthermore, to facilitate observation, data analysis is compiled in a tabulation format. Furthermore, data is collected, arranged sequentially, and processed for use in discussion presentations in the form of tables and infographics, as well as to provide descriptive interpretation. This study identified author collaboration networks by performing co-authorship type analysis (co-authorship type analysis) with author analysis units (author analysis units) and full count methods (full count methods) using the VOSViewer tool. In addition, this study conducted a joint event type analysis (co-occurrence type analysis) with keyword analysis units (keyword analysis units) and full calculation methods [10].

Number of articles: 1151 articles will be evaluated using search articles 1969 to 2024. Keywords: The keywords AND, OR NOT, or AND NOT are used for more detailed journal searches and can facilitate the search for the desired journal. Keywords used include "policy" AND "fire policy *AND* "forest and land fire" Study selection and quality assessment Study selection is done using *Zotero Software*. The first step is to do abstract

screening and continue with full text *screening*. Irrelevant and inappropriate articles or studies are issued taking into account relevance and suitability to the objectives of the Literature Review. Based on the results of literature search through scopus publications using the keywords "Forest Fires" *OR* "Land Fires" AND "Policy".
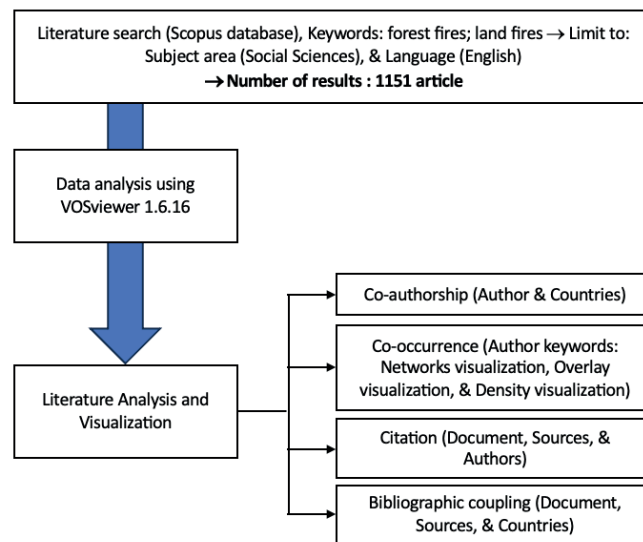

Figure 1: Analysis Bibliometrik.

3. Results and Discussion

A general characteristic of literature resulting from the literature review method is that literature appropriate to the purpose of writing is incorporated into it. In the process of writing a literature review, a summary of research results related to each selected article is included in the form of a summarized table. At the bottom of the table, there is a paragraph explanation of its meaning and trend. Scientific publications are part of a person's research cycle. By publishing it, the results of research or ideas are known by the public so that they can be quickly known, and most importantly, get recognition from the community and the academic world, which is evidence of the existence of the expertise of researchers.

From Figure 1 above, it can be seen that in the period 1969-2023 the trend of international scientific publications in Scopus has increased, the percentage increase even reached 100%. Then in Table 1, it can be seen that the author Stephens, S.L. is the most prolific writer in Scopus with 10 papers, followed by Ahmad, F and Goparaju, L with 8 pieces, and in fourth and fifth positions Barlow, J and Margalef, T with 7 publications.

One of the advantages of using a Scopus database is that it can display the existence of a system of relationships *(corellation)* between journals and publications, as well as
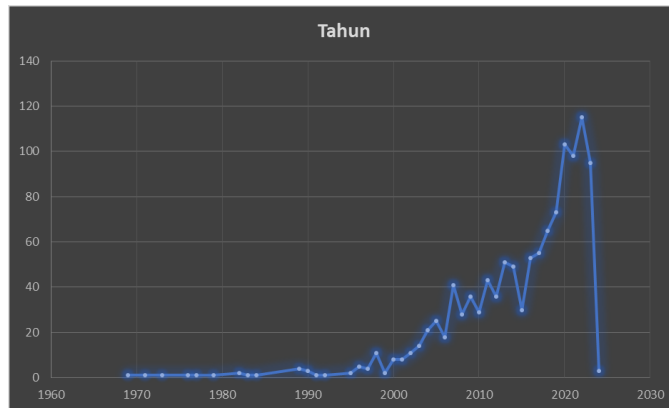
Figure 2: Development Trends of Forest and Land Fires in the World Period 1969-2024. Source : processed by the author based on Scopus data

TABLE 1: Statistics of Top 10 Authors of Scopus Indexed Publications.

Rank	Author Name	Number of Papers	%	Rank	Author Name	Number of Papers	%
1	Stephens, S.L	10	10%	6	Anderson, L.O.	6	6%
2	Ahmad,F	8	8%	7	Aragon, L.E.O.C.	6	6%
3	Goparaju,L	8	8%	8	Cortes, A.	6	6%
4	Barlow,J	7	7%	9	Fulé, P.Z.	6	6%
5	Margalef, T	7	7%	10	For, H.S.	6	6%

Source: data processed based on Scopus data

collaboration between authors. To find out the top ten (20) countries that are collaborators in the publication of land forest fires indexed by Scopus and in the period 1969-2024, can be seen in Figure 2 below. The top 20 countries listed in publication journals such as the lowest country Chile followed by Sweden, Netherlands, Japan, SouthKorea, Russian Federation, France, Greece, Germany, Italy, India, Canada, Portugal, Australia, UK, Brazil, China, Indonesia, Spain, and US. Based on Figure 2 below can be seen in the period 1969-2024 forest and land fire research indexed Scopus.com dominated by the United States as many as 198 publications.and Figure 3 below shows the main collaborator countries in forest and land fire publications.

Figure 4 shows the number of citations to authors collaborating in publications shown by multiple clusters. Where it can be seen that clusters with red color have the highest amount of collaboration by collaborating on yellow, orange and purple clusters. Green clusters also have a high amount of collaboration by collaborating with authors who are in light blue, dark blue and purple clusters. This indicates that authors from different countries are connected dalam penulisan publikasi internasional.
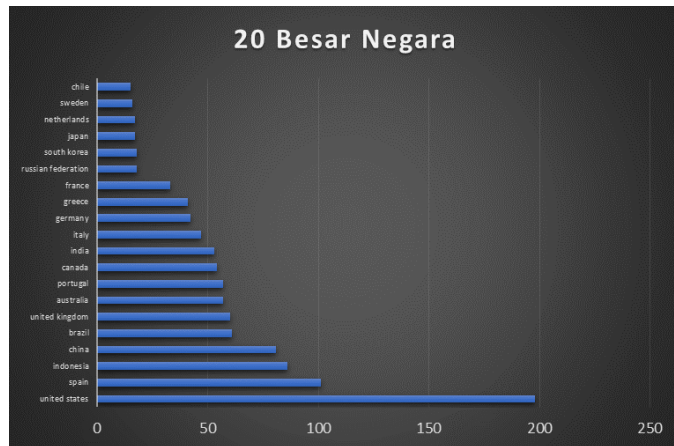
Figure 3: Infographic Publications by Country Collaborators. Source: processed by the author based on scopus data
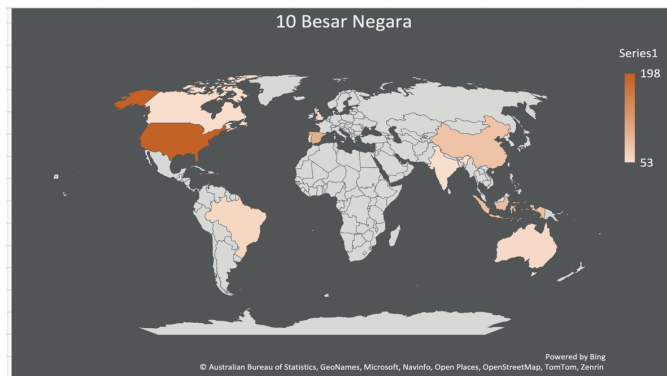

Figure 4: Country main collaborators in the Forest and Land Fires Publication. Source: processed by the author based on scopus data
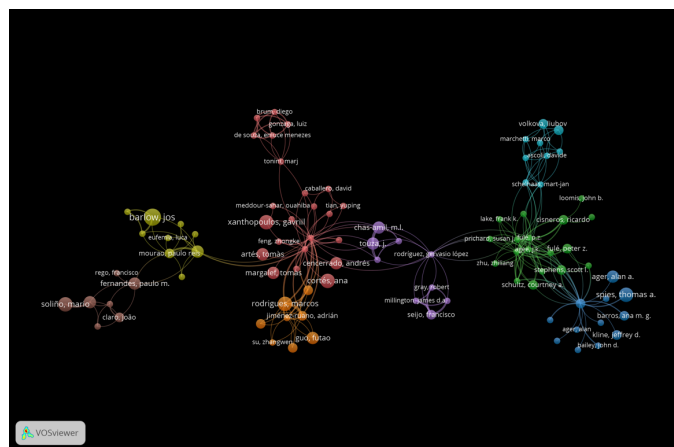

Figure 5: Visualization of citations to collaborating authors. Source : processed by author based on VosViewers

Figures 6 and 7 above show the collaboration of Indonesian authors with authors from other countries based on 1,115 international publications with the highest citations. Explainable that the tendency of Indonesian authors in collaborating with countries is
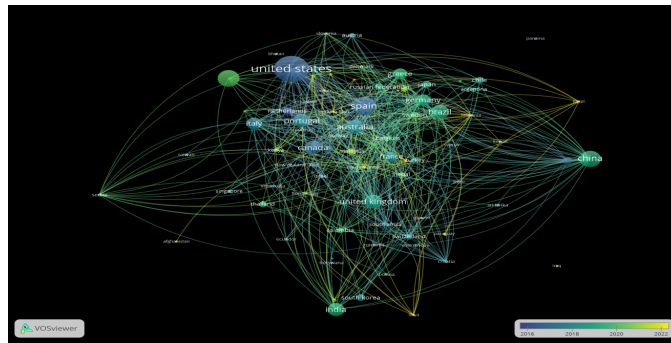
Figure 6: Visualization of Country Forest and Land Fire Collaborators. Source : processed by author based on VosViewers
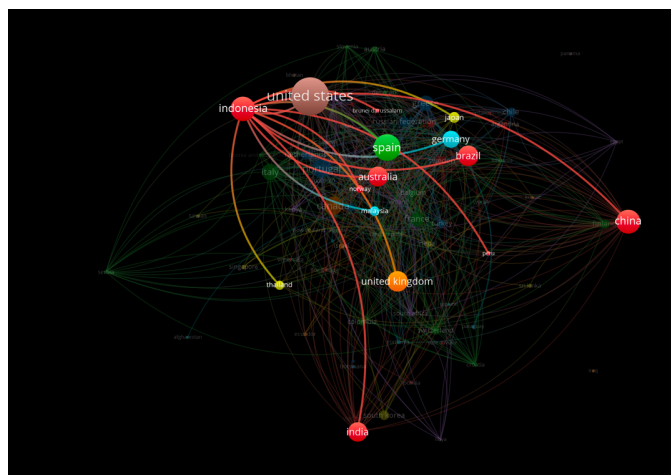

Figure 7: Visualization of the State of Indonesia Collaborators with other countries forest and land fires. Source : processed by author based on VosViewers

displayed from several clusters, where the United States, China, Brazil, Australia, India, Spain, Malaysia, United Kingdom, Japan, Germany, and Peru have a great tendency to collaborate. While other countries have a tendency to collaborate but not significantly.
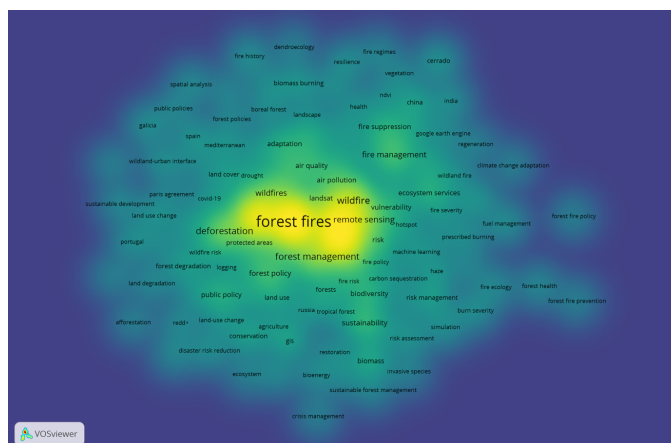

Figure 8: Keyword Density Visualization. Source : processed by author based on VosViewers

In conclusion, Figure 8 shows that the most frequent keyword repetitions include forest fires, deforestation, forest management, wildfire, remote sensing, wildfires, landsat, protected areas. On the other hand, the least used words are crisis management, forest health, forest fire prevention, fire history, fire regimes and others. From the above findings, it is assumed that most of the research on this topic revolves around macro factors.

4. Conclusion

From the results of the study, it can be concluded that for the development trend of international scientific publications on forest and land fires for the period 1969-2024 indexed by Scopus, there has been a very significant increase in Scientific Publications since 2016-2020, amounting to 349 publications. Author Stephens, S.L. is the most prolific author from 1969-2024.Indonesian research indexed by Scopus.com is still dominated by research subjects or fields related to forest fire by 7%. The most productive country in the period 1969-2024 is the United States with a total of 285 documents. The main collaborator countries in the Publication are the United States, Spain, Indonesia, China, and Brazil.

References

[1] Zacharakis I, Tsihrintzis VA. Environmental Forest Fire Danger Rating Systems and Indices around the Globe: A Review. Land (Basel). 2023;12(1):194.

[2] Asteriniah F, Sutina S. Implementation of forest and peatland fire control policy in ogan komering ilir. Journal of Abdimas Mandiri. 2018;1(2): https://doi.org/10.36982/jam.v1i2.338.

[3] Zhou Q, Zhang H, Wu Z. Effects of Forest Fire Prevention Policies on Probability and Drivers of Forest Fires in the Boreal Forests of China during Different Periods. Remote Sens (Basel). 2022;14(22):5724.

[4] Solikhan, M. (2016). Reformulation of forest fire suppression policies in indonesia. The indonesian journal of public administration (ijpa); vol 2, no 2 (2016): indonesian journal of public administration (ijpa) | juli - desember 2016 ;

[5] Kala CP. Environmental and socioeconomic impacts of forest fires: A call for multilateral cooperation and management interventions. Nat Hazards Rev. 2023;3(2):286–94.

[6] Yusuf A, Hapsoh H, Siregar SH, Nurrochmat DR. Analysis of forest and land fires in Riau Province. Environmental Dynamics of Indonesia. 2019 Jul;6(2):67.

[7] Nasi R, Dennis R, Meijaard E, Applegate G, Moore P. Forest fire and biological diversity. Unasylva. 2002;53:.

[8] Doerr, S. H., & Santín, C. (2016). Global trends in wildfire and its impacts: perceptions versus realities in a changing world. Philosophical Transactions of the Royal Society B: Biological Sciences, 371(1696), 20150345. https://doi.org/10.1098/rstb.2015.0345.

[9] Alkhatib AA. A Review on Forest Fire Detection Techniques. Int J Distrib Sens Netw. 2014;10(3):597368.

[10] Purnomo A, Usman I, Asitah N. Entrepreneurship Research In Indonesia : Publication Mapping With Scientometric Perspective (1972-2019). AdBispreneur : Journal of Business Administration and Entrepreneurship Thought and Research. 2019;4(3):207–16.