Bibliometric Analysis of Environmental Research in the Palm Oil Sector

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Abstract. This study analyzes global research trends in the environmental dimensions of the palm oil sector through a bibliometric approach. Using the Scopus database from 2013 to 2023, a total of 21 publications were retrieved and examined with the assistance of Publish or Perish and VOSviewer software to visualize co-authorship networks, keyword co-occurrences, and thematic clusters. The findings reveal that environmental research on palm oil is dominated by Indonesian scholars, reflecting the country's central role in the global palm oil industry. Publication trends show an overall increase in academic output, peaking in 2021 with eight articles (38% of the dataset), while 2014–2016 recorded no indexed publications. Thematic mapping indicates key research areas focusing on sustainability, land-use change, environmental management, and corporate responsibility. Despite progress, the field remains fragmented, highlighting the need for stronger interdisciplinary collaboration and policy-oriented research to address environmental and socio-economic challenges in the palm oil sector. **Keywords**: Environmental research, Palm oil sector, Bibliometric analysis, Sustainability, VOSviewer, Scopus database

1 Introduction

The first research on the theme of palm oil business was published on Scopus Sustainable Business, McManners, P. (2008) and Nwagwu, W.E. (2011). The prospects for the palm oil business are assessed from the fact that world consumption of vegetable oil continues to increase [1]. The problems with the development of the palm oil business are low productivity and large variations in productivity, slow rejuvenation of oil palms and high production costs [2]. Negative campaign against palm oil and derivative products[3]. The palm oil business model maintains good relationships with customers, improves product quality, employee performance, and establishes partnerships with raw material providers..

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[4]. The palm oil business plays an important role in the community's economy with the performance of palm oil trade continuing to increase [5].

Perspectives regarding the future of the palm oil business. Perceptions of investment in the business are starting to decline [6]. The structure and institutions of the palm oil industry are influenced by at least three factors: commodity characteristics, commodity demand and supply conditions and government policies[5]. The pattern of palm oil ownership and exploitation is relatively not concentrated in one dominant group of business actors [7]. On the other hand, the purchase price offer for fresh fruit bunches from palm oil mills without plantations tends to be higher than the purchase price offer for integrated palm oil mills, smallholder oil palm growers divert the sale of their fresh fruit bunch production to palm oil mills without a garden.

The palm oil business is an integral part of the global economy and plays an important role in the country's economy. Palm oil producing countries are actively encouraging global initiatives to strengthen sustainable vegetable oil supply chains. In the energy sector, to maintain people's purchasing power, the Government is trying to maintain the availability of energy at affordable prices for the people as an important pillar in development.

Plantations that manage palm oil commodities generate business profits. First, the high profits the palm oil business obtains from the plantation industry are quite high [8]. Second, the budget for opening oil palm land is small [9]. All the costs mentioned above will return when the harvest time arrives. For the three palm oil businesses, palm oil prices on the market tend to be stable. Fourth, the palm oil business is a business that can provide passive income where profits will always be obtained without any effort [10].

Furthermore, according to the literature review, the bibliometric approach from literature sources has advantages [11]. Bibliometrics has been used as an analytical tool by several journal authors for preparing articles [12]. Further publications on evaluation journal impact university rankings. Then, bibliometric methods are used in various sectors of inquiry, including economics, politicians, and social sciences, In addition, bibliometric studies have been carried out in several fields of study, including environment, industry 4.0, data, artificial intelligence, business, social networks, administrative law, E-Learning, social media, and da'wah.

In general, Bibliometrics can be effective in providing research data that researchers can use to improve the quality of their research [11]. However, until now there has been no bibliometric research regarding the development of palm oil business research.

Table 1. Development of palm oil business research publications

Year	Number of publications	Percentage
2023	1	5%
2022	2	10%
2021	8	38%
2020	2	10%
2019	4	19%
2018	2	10%
2017	1	5%
2013	1	5%
Total	21	100%

Source: Personal Data Processing Results, 2024.

The growth of palm oil business publications has experienced fluctuating developments. Therefore, this research tries to visualize the results of palm oil business research on bibliometric maps and research trends in publications in the Scopus database using VOSViewer software. The findings of this research certainly provide a sustainable solution for understanding the development and innovation of researchers in the field of palm oil in the world.

2 Method

The methodology employed in this scholarly investigation is characterized by a descriptive bibliometric analysis, utilizing publication data [13]. The focal point of the research pertains to the domain of palm oil business research, covering a temporal span of a decade, specifically from 2013 to 2023, utilizing documents sourced from Scopus. The process of data acquisition was executed through systematic publication searches conducted via the Publish or Perish application. Upon the collection of data pertaining to 21 studies, this information was preserved in the format of a Research Information Systems Citation File, which was subsequently processed utilizing Vosviewer software.

Bibliometric analysis constitutes the implementation of statistical and mathematical methodologies to various forms of literature, including books, journals, online publications, and communication media [14], [15]. The resultant mapping generated by Vosviewer can subsequently serve as a foundational reference for conducting precise content analysis, which is predicated on factors such as the researcher's identity, publication year, researcher productivity, document count, institutional affiliation, and emerging trends within the palm oil research domain.

3 Results and Discussion

The growth of palm oil business publications has experienced fluctuating developments. There are 21 publications indexed by Scopus from 2013-2023. The highest growth in palm oil business publications occurred in 2021, reaching 8 publications (38%). Meanwhile in 2014, -2016 there were no publications in Scopus. Even though it has experienced fluctuating developments in several years, the development of palm oil business research in quantity proves that research in this field is still a topic of interest and continues to grow from year to year in Indonesia as can be seen in Figure 2.

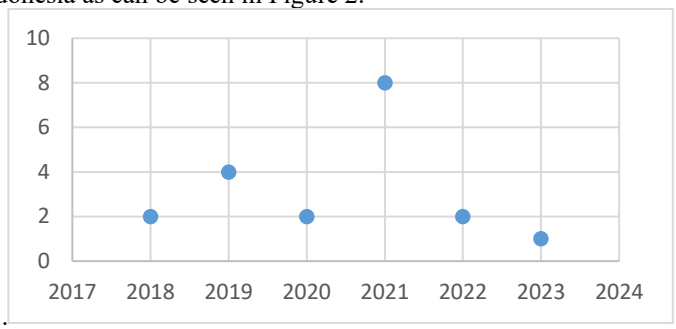

Fig. 1. Graph of the development of palm oil business research.

Subsequently, it is imperative to conceptualize the article data with respect to authorship, alongside citations and documentations. The initial visualization pertains to co-authorship, which seeks to ascertain the frequency of author contributions in the composition of articles, wherein each author is associated with multiple article documents as illustrated in Figure 2.

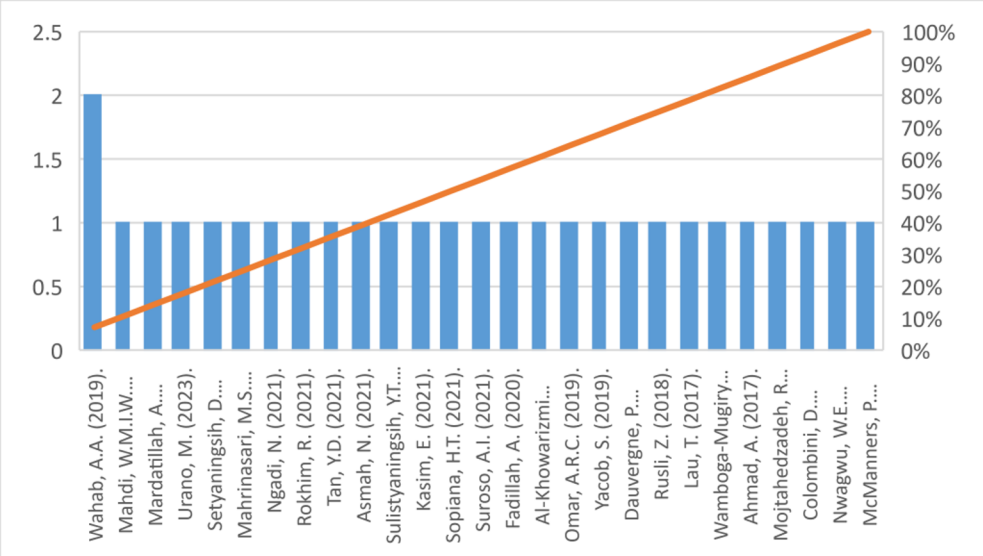

Fig. 2. Authors' documents in Scopus, 2024 .

Based on Figure 2, the top document of journalism articles is the author Wahab, A.A. (2019) (2). Then followed by other authors with the same number (1), namely Mahdi, W.M.I.W. (2023). Mardatillah, A. (2023). Urano, M. (2023). Setyaningsih, D. (2022). Mahrinasari, M.S. (2022). Ngadi, N. (2021). Rokhim, R. (2021). Tan, Y.D. (2021). Asmah, N. (2021). Sulistyaningsih, Y.T. (2021). Kasim, E. (2021). Sopiana, H.T. (2021). Suroso, A.I. (2021). Fadillah, A. (2020). Al-Khowarizmi (2020). Omar, A.R.C. (2019). Yacob, S. (2019). Dauvergne, P. (2018). Rusli, Z. (2018). Lau, T. (2017). Wamboga-Mugirya, P. (2017Ahmad, A. (2017). Mojtahedzadeh, R. (2013). The development of Scopus authors is still low on palm oil business. Most of these authors are affiliated with several institutions in research publications in the field of business and the environment.

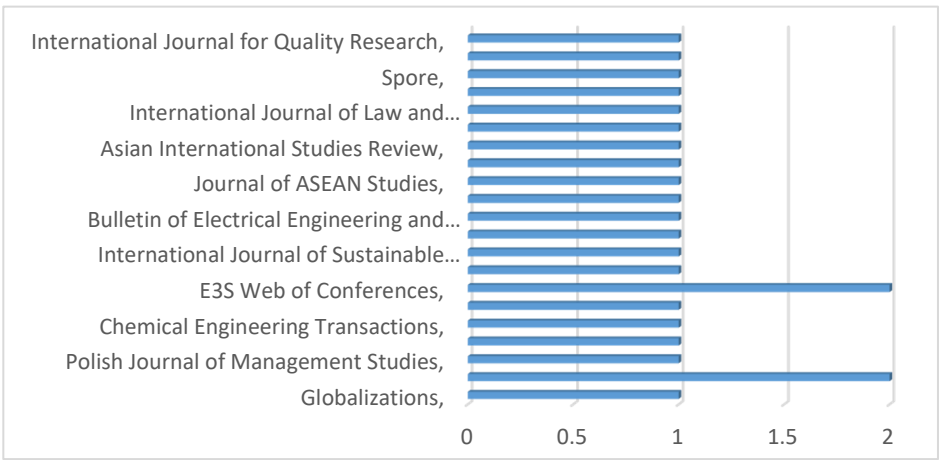

Fig. 3. Publication graph by publication.

Figure 3 shows a network visualization of university authors who concentrate on researching the challenges of the palm oil business, namely researcher Wahab, A.A. who is a lecturer at the Institute of Malaysian and International Studies, Malaysia

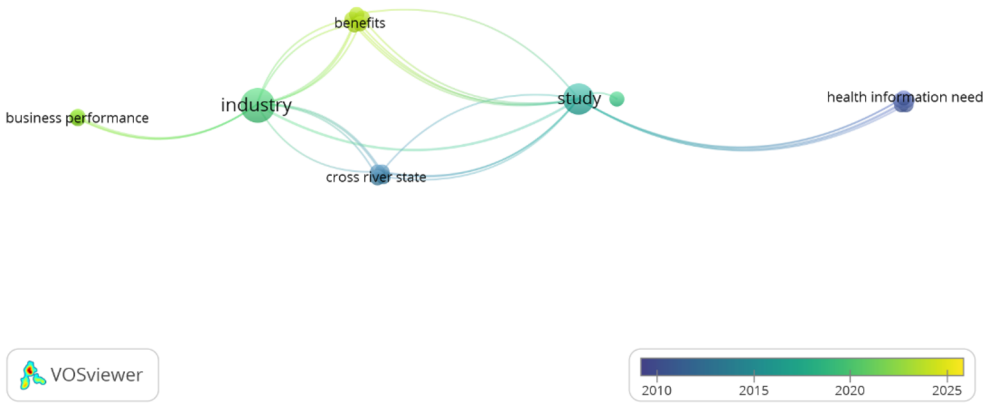

Fig. 4. Overlay visualization of the palm oil business.

Figure 4 illustrates a conglomeration of pivotal themes, with the industry and scholarly inquiries emerging as fundamental nodes, indicating that research within the domain of palm oil predominantly concentrates on investigations pertinent to the industry. The robust correlation between the industry and the concepts of benefits and "business performance" signifies a considerable scholarly interest in the ramifications or advantages accruing from activities within the palm oil sector, both from an economic and operational perspective. Furthermore, the identification of Cross River State as a node interlinked with the industry and academic study underscores that this research possesses a distinct geographical dimension. This observation exemplifies a localized and contextually nuanced approach to scholarly inquiry [30].

The prevalence of the blue hue in nodes such as study and health information needs suggests that these subjects, particularly those pertaining to health information requisites, are reflective of emerging trends or the focal points of more recent scholarly inquiry, particularly towards the latter segment of the depicted timeline. This phenomenon may be construed as an adaptation to prevailing contemporary challenges, exemplified by the digital transformation prevalent within the palm oil sector. In summary, this conceptual map serves not only as a representation of the thematic landscape but also delineates the progression of knowledge, revealing a shift from an emphasis on industrial advantages to addressing more specific and contemporary concerns, such as the demand for health information within local contexts.

4 CONCLUSION

Based on the results of the mapping analysis, it may be inferred that during the interval of 2013 to 2023, the advancement of the palm oil industry has undergone variable developments in terms of scholarly publications. Among the total publications cataloged by Scopus, there exists a compilation of 21 documents. The most significant growth in publications was recorded in the year 2021, with an attainment of 8 journals, representing 38% of the total. Subsequently, the ramifications of this research are intrinsically tied to the focus on the palm oil industry aspect. Additionally, this study is constrained by its limitations, as it exclusively examines documents within Scopus that pertain to the theme of the palm oil industry. Consequently, we advocate for future research endeavors to be conducted with an expanded scope to underscore the necessity for heightened attention to palm oil, particularly within the contexts of Indonesia and Malaysia.

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