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Bibliometric Analysis: The Development of Research and Publications on Sustainable Development Goals (SDGs) and Their Impact on Investment

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ABSTRACT

Purpose: *This study aims to analyze the literature on Sustainable Development Goals (SDGs) and their impact on investment using bibliometric analysis.* ***Design/Methodology/Approach:*** *This study uses 41 articles collected from the Scopus database, with the analysis including keyword analysis, trend analysis, and density visualization.* ***Findings:*** *The analysis identified four main topic clusters: 1) carbon dioxide, climate change, economic development; 2) foreign direct investment, governance, private sector; 3) socio-economic impacts, environmental quality, emerging economies; 4) alternative energy, environmental economics, spatiotemporal analysis. The main focus is SDGs and investment.* ***Practical Implications:*** *This analysis helps understand trends and key topics in research related to SDGs and investment, which can support more targeted research planning in the future.*

Keywords: *Development, sustainable development goals, SDGs, investments, bibliometric*

INTRODUCTION

The Sustainable Development Goals (SDGs), established by the United Nations in 2015, is a set of 17 global goals to address various urgent global challenges, including poverty, inequality, climate change, environmental degradation, peace, and justice, to be achieved by 2030. Achieving the SDGs requires collective efforts from governments, the private sector, civil society, and individuals worldwide. In this context, sustainable investment plays a crucial role in supporting projects and initiatives aligned with these goals.

With increasing awareness of the importance of the SDGs, research and scientific publications on this topic have also seen a significant rise. Bibliometric analysis, as a quantitative method for measuring scientific publication patterns, allows us to understand the development of research related to SDGs and its impact on investment. This analysis involves collecting and analysing publication data to identify trends, collaboration patterns, and research focus areas.

The SDGs provide a comprehensive and ambitious framework for sustainable development. Globally, they encourage countries to adopt more environmentally friendly and socially just policies and practices. Locally, the SDGs help local governments, organisations, and communities set development priorities relevant to their specific contexts.

Investment plays a significant role in achieving the SDGs. Sustainable investment can mobilise the resources needed to fund projects supporting these goals, such as green infrastructure, renewable energy, education, and health. Furthermore, sustainable investment can attract investors interested in stable long-term returns and positive impacts on society and the environment.

Bibliometric analysis can provide deep insights into research trends and publications related to the SDGs. By analysing publication data from extensive scientific databases, we can identify how SDG-

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related topics evolve, who is involved in this research, and which areas receive the most attention. This not only helps researchers and policymakers understand the existing research landscape but also identifies research gaps and collaboration opportunities

LITERATURE REVIEW

The Sustainable Development Goals (SDGs) are a collection of global objectives set by the United Nations (UN) to be accomplished by 2030. The SDGs consist of 17 goals and 169 targets addressing diverse aspects of sustainable development, such as poverty, health, education, energy, climate change, and international partnerships (United Nations, 2015). Achieving these goals necessitates dedication and cooperation from a range of stakeholders, including governments, the private sector, civil society, and academics.

Research on the impact of SDGs on investment has become an increasingly attractive topic for academics and practitioners. Investment is a critical factor in supporting the achievement of sustainable development goals. Investment can be public or private, domestic or foreign, directed towards sectors aligned with the SDGs agenda (UNCTAD, 2014).

Bibliometric analysis is a method that can be used to map the development of research and scientific publications on a particular topic. Bibliometric analysis can identify trends, patterns, and structures in a field of science using bibliographic data such as titles, abstracts, keywords, publication years, and author information (Aria & Cuccurullo, 2017).

Several bibliometric studies have been conducted related to SDGs and investment, including: 1) A bibliometric study by Filho et al. (2020) analysing scientific publications on SDGs from 2012 to 2019. The results show a significant increase in publications related to SDGs since the establishment of the 2030 Agenda by the UN. The most researched topics are poverty (SDG 1), education (SDG 4), and energy (SDG 7). 2) Research by Machado et al. (2018) conducted bibliometric analysis to identify research patterns and trends on sustainable investment. The study results show that sustainable investment is becoming an increasingly popular topic, with research focusing on issues such as corporate social responsibility, social investment, and sustainable project financing. 3) A study by Leal Filho et al. (2021) analysing research development related to SDGs in low- and middle-income countries. The results show that scientific publications on SDGs in these countries are still limited, and efforts are needed to enhance research capacity and international collaboration.

METHOD

This study will use a bibliometric analysis approach to map the development of research and scientific publications related to the relationship between Sustainable Development Goals (SDGs) and investment. As stated by Aria and Cuccurullo (2017), "Bibliometric analysis is an effective approach for mapping research trends, collaborations, and impacts in a field of science."

Data collection will be done using comprehensive bibliographic databases such as Scopus, Web of Science, or Google Scholar (Garousi et al., 2019). The search strategy will combine keywords such as "Sustainable Development Goals," "SDGs," "investment," and bibliometric terms such as "bibliometric analysis," "scientific mapping," and "publication trends" (Wiśniewska & Kowalska, 2020). The selection of articles will focus on publications discussing the link between SDGs and investment published between 2015 and 2023.

Bibliometric analysis will start with a descriptive analysis to identify publication trends based on the number of countries of origin, author affiliations, and journals of publication (Merigó et al., 2016). Next, a collaboration analysis will map the collaboration patterns of authors, institutions, and countries (Van Eck & Waltman, 2014). Content analysis will focus on identifying the main topics researched through keyword analysis, abstracts, and full-text articles (Hammarfelt, 2016). Additionally, impact analysis will evaluate the impact of publications through citation analysis, h-index, and other bibliometric indicators (Liao et al., 2018).

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The analysis results will be presented in easily understandable visualisations such as graphs, diagrams, and bibliometric maps (Van Eck & Waltman, 2014). Interpretation of the analysis findings will be linked to the existing literature and highlight theoretical and practical implications. The research conclusion will summarise the main findings, limitations, and recommendations for future research.

RESEARCH RESULTS AND DISCUSSION

Keyword Analysis

The purpose of this stage is to gain a deeper understanding of the content, structure, and trends of the documents analysed. This is done by identifying important terms and patterns of keyword occurrence in these articles.

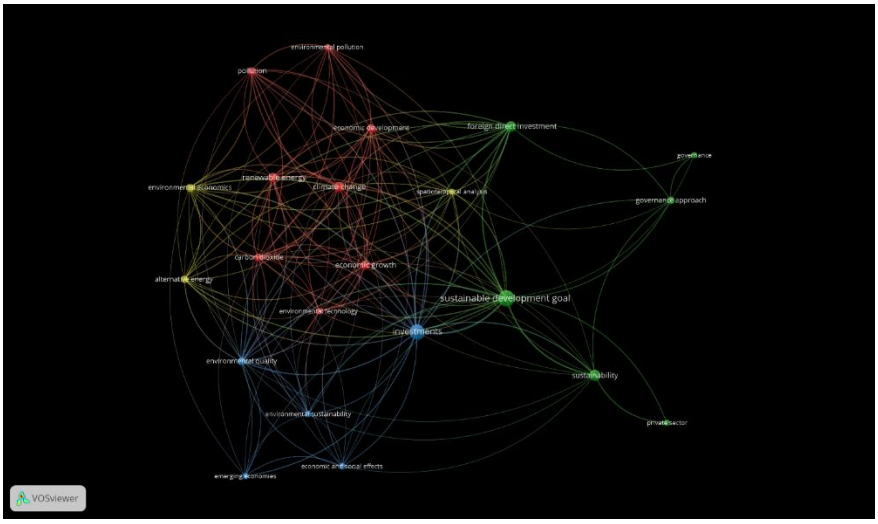

Figure 1
Network Visualisation Map Showing Keywords
Source: VOSviewer (2024)

In this study, 425 keywords were identified with a minimum occurrence of 3 times, resulting in 22 relevant keywords. There are 4 clusters: cluster 1 (red) contains 8 items (carbon dioxide, climate change, economic development, economic growth, environmental pollution, environmental technology, pollution, renewable energy); cluster 2 (green) contains 6 items (foreign direct investment, governance, governance approach, private sector, sustainability, sustainable development goal); cluster 3 (blue) contains 5 items (economic and social effect, emerging economies, environmental quality, sustainability, investments); cluster 4 (yellow) contains 3 items (alternative energy, environmental economics, spatiotemporal analysis). The term most frequently used in the titles is “Sustainable Development Goals” with a total of 75 occurrences.

Trend Analysis

Figure 2 illustrates the trend of research on SDGs' impact on investment over the years. Based on Figure 2, the research spans from 2021 to 2023.

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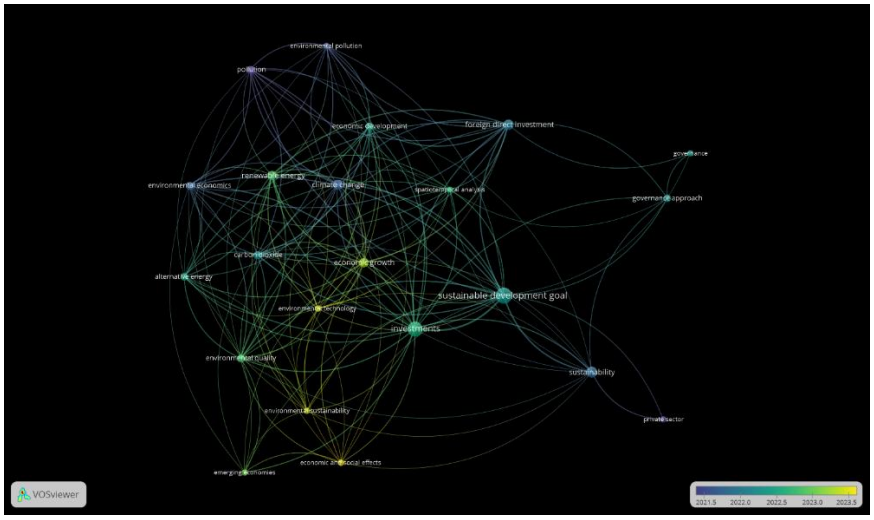

Figure 2
Overlay Network Visualisation Map
Source: VOSviewer (2024)

From the figure above, it can be seen that the metadata topics that became the focus of research were mostly published in 2022, whereas in 2023, the emerging topics were economic growth, environmental technology, environmental sustainability, and economic and social effects.

Density Trend Analysis

Density visualisation in Figure 3 can be used to see patterns and trends of keyword occurrence in research, where the darker and larger the circle, the more popular and researched the topic is, and the number of studies decreases if the colour fades and blends with the green background.

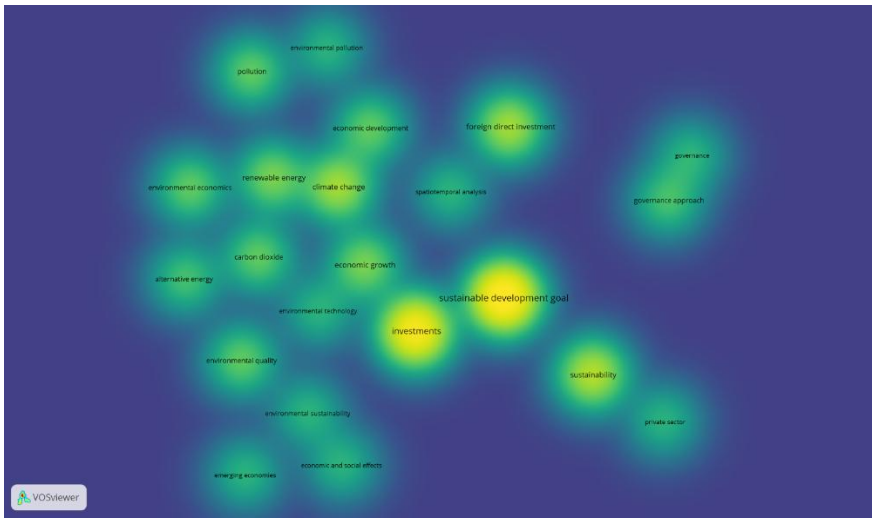

Figure 3
Density Visualisation Map
Source: VOSviewer (2024)

Based on Figure 3, the most discussed topics are sustainable development goal (total strength 75) and investment (total strength 66). In contrast, the least discussed topics are governance (total strength 5) and private sector (total strength 5).

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CONCLUSIONS, PROPOSALS, RECOMMENDATIONS

Bibliometric analysis is a scientific method that can be beneficial for researchers seeking to conduct a retrospective review of a broad and rich field of research. The bibliometric methodology has gained significant popularity recently due to the availability and usefulness of bibliometric software and databases, which facilitate the acquisition and evaluation of large volumes of scientific data. One important and relatively new application of bibliometric is in the coordination of research programmes.

This study uncovers several key pieces of information that help illustrate an accurate representation of research on the impact of SDGs on investment. The study utilises 41 articles related to the impact of SDGs on investment, all of which were collected from the Scopus database. The researchers chose to use Scopus due to its rigorous peer-review process and reputation. Narrowing the search results based on predefined categories left 41 articles out of 1,217 (a reduction of 96.3%).

Based on the keyword analysis, there were 425 keywords identified. Using a minimum occurrence threshold of 3, 22 relevant keywords were found. There are 4 clusters: Cluster 1 (red) contains 8 items (carbon dioxide, climate change, economic development, economic growth, environmental pollution, environmental technology, pollution, renewable energy); Cluster 2 (green) contains 6 items (foreign direct investment, governance, governance approach, private sector, sustainability, sustainable development goal); Cluster 3 (blue) contains 5 items (economic and social effects, emerging economies, environmental quality, sustainability, investments); Cluster 4 (yellow) contains 3 items (alternative energy, environmental economics, spatiotemporal analysis). The most frequently used term in the titles is “Sustainable Development Goal” with a total of 75 occurrences. According to the trend analysis, most of the research focusing on metadata topics was published in 2022, whereas in 2023, the emerging topics were economic growth, environmental technology, environmental sustainability, and economic and social effects. For density visualisation, the most discussed topics are sustainable development goal (total strength 75) and investment (total strength 66). Conversely, the least discussed topics are governance (total strength 5) and private sector (total strength 5).

Based on the conducted bibliometric analysis, several recommendations can be considered. Firstly, there is a need to enhance the coordination of research programmes related to Sustainable Development Goals (SDGs) and their impact on investment. Bibliometric analysis has proven to provide a comprehensive overview of the developments, trends, and main topics in this research field, which can be utilised to design more coordinated and targeted research programmes. Secondly, there is a need to deepen research on less discussed topics, such as governance and the role of the private sector. Although “Sustainable Development Goal” and “investment” are the main focuses, other topics like governance and the private sector are still relatively underexplored. Hence, efforts should be made to deepen studies in these areas. Thirdly, there is a need to expand the database and literature search criteria. This study only used 41 articles from the Scopus database. To obtain a more comprehensive overview, it could be considered to expand the database and literature search criteria, for instance, by adding other databases or extending the range of publication years. Fourthly, there is a need to validate and compare the results of bibliometric analysis with other methods. While bibliometric analysis can provide a general overview, it should be validated and compared with other analysis methods, such as systematic reviews or meta-analysis, to gain a deeper understanding.

Research Limitations

This study has limitations in terms of data coverage, using only 41 articles from the Scopus database. The results may not be fully representative, so further studies are recommended to include other databases such as Web of Science.

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Practical Recommendations

For Researchers: Expand research on underexplored areas, such as governance and the contribution of the private sector to achieving SDGs. For Policymakers: Encourage cross-sector collaboration to enhance green investments.

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