

Assessing Productivity Implications and Eco-friendly Progress in Sustainable Development Goals (SDGs): A Bibliometric Analysis

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Introduction: An important worldwide issue that provides a framework for resolving a wide range of environmental and socioeconomic issues is sustainable development. Evaluating research contributions in this area is critical for understanding advancements toward green practices and sustainable growth. The current research objectives are to illuminate many facets of sustainable development and their impact on eco-friendliness and productivity using an extensive bibliometric analysis.

Method: This study is based on Elsevier Scopus-indexed scientific publications, which are categorized for Sustainable Development Goals (SDGs) relationships once it is indexed. We make use of the Scopus engine provided by Elsevier, and bibliometric assessment and benchmark technology. We report on the most important authors and publication areas for research related to the SDGs, with a concentration on collaboration patterns and the relationship between these developments and research output impact. The study demonstrates the progression of research themes and trends in the SDGs, with a special emphasis on descriptive ideas that underlie sustainable development.

Result: We recognize major research items that have a substantial influence and have contributed to eco-friendly advancement. Furthermore, the evaluation of collaborative networks gives insights

into the positioning of research partnerships within the Sustainable Research Database, identifying possible areas for further synergy and information exchange.

Conclusion: The bibliometric analysis offered in this paper launches into focus the efficacy consequences and eco-friendly advancements in the arena of SDGs. It highlights the significance of comprehending scientific contributions from the perspective of sustainable development.

Keywords: Productivity Implications; Eco-friendly; Sustainable Development Goals (SDGs), bibliometric analysis.

1. Introduction

Plastic is an incredible substance that promotes economic development and synthetic modernity. It can be a source of waste when it is disposed of carelessly and unethically in any environment.⁽¹⁾ Due to the expanding global concerns, regions must employ methods and techniques for economic growth that are less hazardous to the ecosystem and protect resources from changing the climate, growing populations, pollution of the environment, and ineffective utilization and exhaustion of natural resources.⁽²⁾ The investigation intends to shed light on the plans, regulations, and technologies that can promote developments toward an improved and equitable environment for all by analyzing the multiple consequences of productivity within the framework of sustainable development.⁽³⁾ The SDGs list updated objectives of economic, social and improvements in the environment, containing the elimination of scarcity and the promotion of economic growth and environmental preservation. Everybody in the Global participation in the SDGs is anticipated, included governments, businesses, civil groups, and ordinary individuals.⁽⁴⁾ Global warming, energy production, and energy storage are discussed issues in society and are popular subjects for environmental and economic research. The objectives, which cover concerns such as reducing poverty, ensuring environmental sustainability, fostering economic growth, and achieving social equality, present a road map for addressing the most serious difficulties that the world is currently facing Productivity Implications and Eco-friendly Progress in SDGs.⁽⁵⁾

The study⁽⁶⁾ of modern Green supply chain management (GSCM) is a kind of supply chain management. lessens the harmful consequences of using non-sustainable manufacturing methods while incorporating environmental and ethical concerns into the conventional supplier chain. The outcomes of the research demonstrate that government regulations and laws, financial tax incentives, and consumer demand are the three main variables that impact how GSCM processes are used in the textile industry. The article⁽⁷⁾ objective was to evaluate how innovations from Industry 4.0 affect sustainable development. They used instance research and a thorough literature analysis to examine the effects of Industry 4.0 technology. The findings give practitioners and policymakers a comprehensive understanding of how these innovations might support or impede sustainable development. The research⁽⁸⁾ investigated into how sustainable development affects environmentally conscious and resource-efficient societies. The analysis's findings demonstrate the substantial positive influence that environmentally conscious and resource-efficient societal construction has overall sustainability. The author⁽⁹⁾ determined how much the SDGs have been attained at the local, regional, and national levels by agricultural

enterprises. Results demonstrated a low level of SDG awareness in the agri-food sector and gave a quantitative assessment of that awareness. According to the study ⁽¹⁰⁾ biofuels were the viable and sustainable energy option that can aid in mitigating environmental pollution concerns. As a result, ecosystem management methods are needed to produce bioenergy that is sustainable and doesn't harm or even improve important ecosystem functions. The article ⁽¹¹⁾ provided an effective multi-criteria method for making choices that integrates the laboratory for assessment and testing, which produces gray decisions, and the fuzzy difficult technique of appropriate assessment was used to investigate limitations to the circular economic operations. The outcomes allow the business communities and government to establish the appropriate procedures for implementing circular economic principles in the leather industry. The research ⁽¹²⁾ explored the health advantages of utilizing eco-friendly building materials, and assumption and SDG-based selection standards in the development of a large health change. Utilizing techniques, for instance, for occasions as the technique for the development of research, the researchers employed the qualitative research technique for the investigation. Results indicate that materials might be the most appropriate for health resort buildings' external and interior design. The author ⁽¹³⁾ illustrated sustainable energy solutions that connect to SDG-related initiatives, offering a roadmap for directing the effects of the pandemic on an environmentally friendly, ecologic certainly. Experimental findings show that long-term development plans' emissions reduction objectives have a significant impact on energy conservation and emission reduction, lowering the intensity of carbon emissions and energy consumption. The study ⁽¹⁴⁾ examined into the SDGs can be achieved through sharing economy approaches, including eco-design, customer green management (CGM), supply management of sustainability (SMS), and internal green management (IGM). The findings demonstrates the beneficial contributions that SSM, ecological design, corporate social responsibility, a continuous glucose monitor, and IGM play in helping E7 economies achieve the SDGs. The article ⁽¹⁵⁾ regarded to the epidemic and probable prospective global disaster. The report offers important original insights to assess feasible techniques, possibilities, issues, and prospective stage capacity for the development of power systems and SDGs.

The following section of the paper can be summarized. Section 2 discussed about the materials and methods of Elsevier Scopus. Results of the Productivity Implications and Eco-friendly Progress in SDGs were discussed in the Section 3. Section 4 concludes the findings.

2. Materials and Methods

Considering that the Elsevier Scopus dataset covers the outcomes of social science investigation more comprehensively than the nearest opponents and the preferred bibliometric database for aligning empirical data with SDGs, we have chosen it as the main source of bibliometric information. Users of bibliometric analysis are able to correlate the majority of Scopus-indexed research outputs with relevant SDGs according to a continuing SDG design effort based on the outcomes of the research. It uses machine learning computer techniques to refine it depending on significant bibliometric queries.

Obtaining SDG-based research and gathering bibliometric information according to the research technique created based on an assessment of citations and offer an extensive understanding of developments and field structure. More investigation should address the kind of research, as the RQs exclude the bibliometric assessment of the entire field of knowledge on sustainable development. Elsevier computed all metric values using the fundamental Elsevier Scopus data.

3. Results

The bibliometric analysis results for an amount of research generated between 2019 and 2022 that is indexed by Elsevier Scopus are demonstrated in the section.

Assessment of the Research Collection in Descriptive Concepts

In an integrative SDG research area, 1 517 academic results with citations were generated between 2019 and 2022. Figure 1 show how the number of records increased quickly during the preceding four years, with a total of three times more records in 2022 than in 2019.

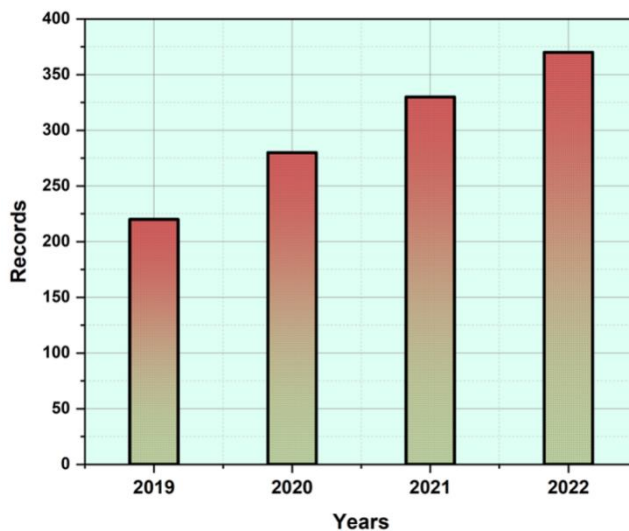


Figure 1. Annual Research Outcomes in SDG (Source: Author)

Articles represent the majority of these materials, with chapters in books, assessments (7, 1 %), and paper presentations (6, 9 %). A fraction of all records belong to different categories. We examined the areas in which the preceding documents are important. Integrity is regarded in Figure 2 as an essential element of SDG research.

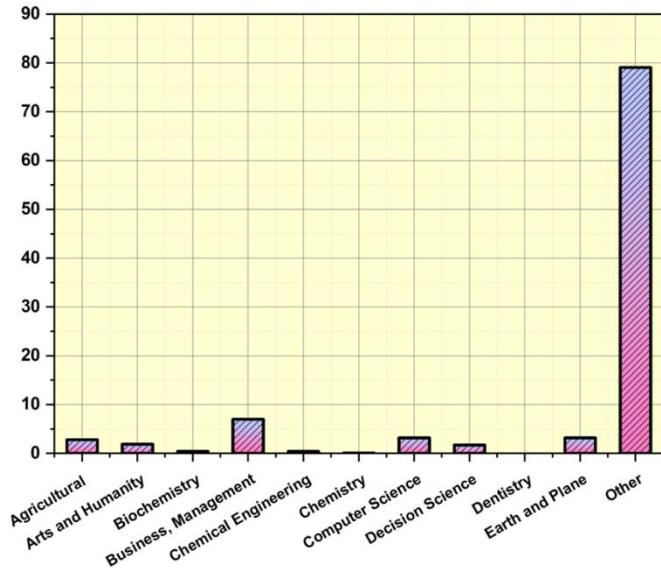


Figure 2. Scientific results organized by the field (Source: Author)

United States (270) is the most producing nation according to the geographical distribution of the records (Figure 3).

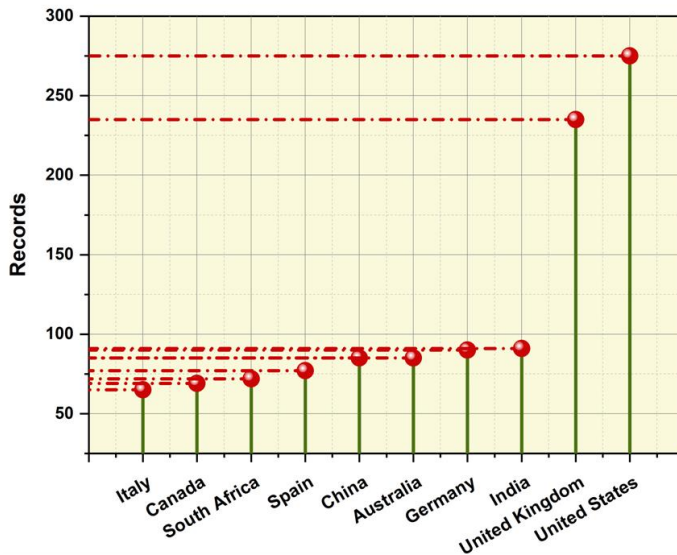


Figure 3. Scientific productions by nation and region (Source: Author)

Figure 4 provides an explanation of the number of records by affiliation with an emphasis on the intellectual output. The combined indexed scientific outputs of these three institutions in the subject of SDG research exceed 10.

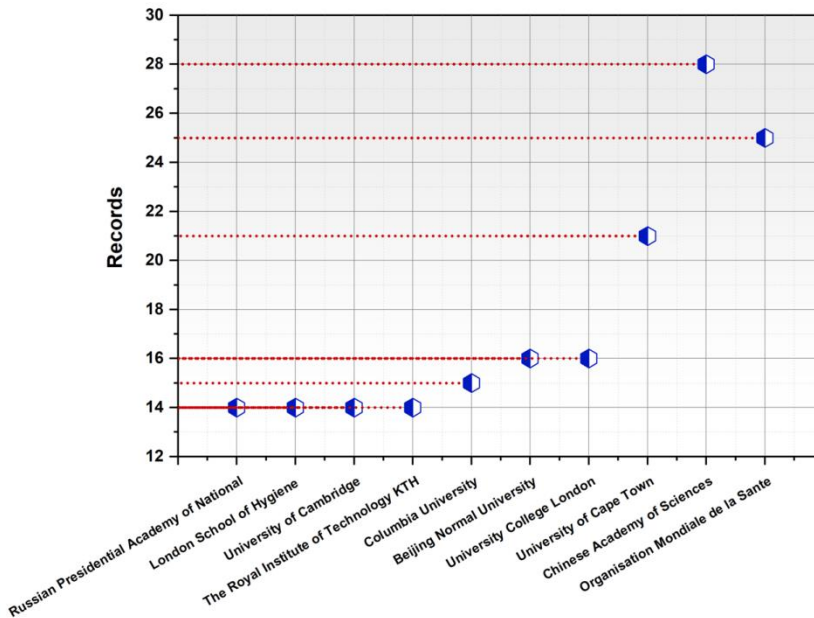


Figure 4. Outcomes of research with an institution (Source: Author)

Impact Analysis of Research Corps and Productivity

If desired, a wide variety of performance metrics could be used in an assessment. The indicators include things like the percentage of publications with the highest number in the report, the number of citations in each report, the field-weighted citations impact (FWCI), and international cooperation. The standards of selected sets of criteria pertaining to the impact and efficacy of research are shown in Table 1 for the years 2019–2022.

Table 1. Globally SDG research bibliometric performance metric (Source: Author)

	2019	2020	2021	2022	Overall
Scholarly Output	221	283	329	371	1 512
Citations per Publication	16	9,3	5,2	1,9	10,4
Authors	562	821	995	1 212	3 967
International Collaboration (%)	26	26.2	24	33	27,6
Citations	3 476	2 585	1 675	662	15 589
Field-Weighted Citation Impact	2,15	1,44	1,6	1,7	1,77

Table 1 data demonstrates that the percentage on average, considering an average of 1,77, the Field-Weighted Citations Impact is higher than one annually. The metric is important because it accounts for the quantity of citations an article collects and the specific field in which it is revealed, correcting for variations in publication norms and citation patterns amongst study fields. The records included in the sample appear to have a larger citation impact than the field average, as indicated by a total impact of 1,77.

Evaluation of the Most Important Research Products

Durability on a smaller level, technology and sustainable development has contributed to the increase in documents. Over the years, the amount of records published in a global Improvement. Report has changed, with fewer than five reports in 2022. Even more; change *Nanotechnology Perceptions* Vol. 20 No. S5 (2024)

over time generates a result that is comparable to the global procedure. A possible decrease in releasing quality requirements and evaluation standards and the increasing production of individuals may be considered an indication of the involvement in and importance to the field.

The utilization of the field-normalized citation metrics is necessary for the interconnections perspective of the SDG assessments because different areas have distinct citation patterns, which vary the projected total number of citations across scientific domains. In light of the SDG research impact, it is crucial to estimation of the FWCI assessment of SDG consumption sources, which results in the identification of the following five records: Politics and Management, Marine Regulations, Nature Sustainable Development, Higher Learning, and Environmental Energy.

Placement of the Examined Collaboration in the Sustainable Research Database

The initial pace in establishing the analyze section of the research on sustainability to conduct an investigation into significant aspects. The Elsevier SciVal algorithm was used to determine which four categories are the most significant.

Table 2. Key concepts that appear annually (Source: Author)

Key Phrase	2019	2020	2021	2022
Sustainable Development	2 100	1 572	1 008	348
SDG	2 659	2 127	1 436	582
Agenda	1 631	1 010	803	293
MDGs	264	94	47	15

Table 2 demonstrates a U-shaped inversion for the initial four crucial sentences. The important concepts occurred more frequently in the research of the subsequent years. The COVID-19 pandemic can have affected to the minor decreasing concern in the subjects. All important representations, aside from the Millennium Development Goals, saw a significant increase in research articles as a consequence of research performance.

4. Discussion

The SDGs investigation explores the relationship between environmental degradation and economic growth. During a long duration, data analysis indicates that growth in the economy positively and significantly affects carbon dioxide emissions. ⁽¹⁶⁾ An analysis of short- and long-term assessments indicated that energy productivity is important for enhancing environmental quality and sustainable ecology. Therefore, obtaining SDG-7 and reducing pollution emissions will be made possible by greater efficiency and renewable energy sources. ⁽¹⁷⁾ Mining operators should document the implications of their operations for attaining sustainability and connect those implications to the SDGs' consequent relevance assessment. ⁽¹⁸⁾ The conclusions regarding the effects of imposing green taxes are examined, remembering how the SDGs and other aspects of sustainable development are interconnected. The economy's sustainability enhances preparation and resilience for managing issues of impact on the environment, changes in climate, and various unplanned environmental disasters and diseases, including COVID-19 prevalent. ⁽¹⁹⁾ The research demonstrates an extensive and integrated approach to sustainable development goals is essential to accelerating the transformation, it is anticipated that the collaboration can accelerate emphasize accomplishments. ⁽²⁰⁾

5. Conclusion

To accomplish the SDGs and establish more sustainable developing instances, it is important that the productivity implications and progress be assessed. It is certain that improving efficiency and incorporating eco-friendly techniques can operate together side by side during the endeavor to attain the SDGs. By promoting sustainable development, we can make certain economic expansion does not come at the expense of the health of the earth or the welfare of future generations. Collaboratively to identify innovative techniques that support economic efficiency while protecting the environment is essential for governments, corporations, and individuals everywhere. The SDGs' drive for advancement will be crucial in ensuring that the future people maintain prosperity, sustainable, and equity for individuals.

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