Green Accounting Study: Twenty-Seven Years Lesson of Scientometric Mapping

by Anita Kartika Sari

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Abstract

Green accounting is a new type of accounting that has started to emerge over time. This has been research but as yet no idea about green accounting study that shows the big picture using data from all countries. This paper aims to review the status and visual map position of green accounting study indexed by Scopus used a scientometric. The research was carried out using scientometric techniques. Data analysis as well as visualization utilising VOSViewer program and the Scopus function for analyze search results. In this review, the details collected applied to 200 documents issued from 1992 through 2019. The study reveals that Cairns, R.D, and McGill University were the most active individual scientists and affiliated institutions in the Green Accounting study. In green Accounting, Environmental Science and Ecological Economics were the most areas of study and dissemination sources. There were four worldwide group maps with collaborative researchers. In order to identify the body of knowledge created from twenty-seven years of publication, this study constructed a convergence axis grouping comprising of Green Accounting Study: Social, Sustainable, Savings, Environmental, Economic, Accounting, abbreviated as the SSSEEA theme.

Keywords
Accounting, Green Accounting, Scientometric, Vosviewer.

1. Introduction

Nowadays, population growth is one of the factors causing the limited natural resources, because of this, protection of the environment is now being raised as an important thing that really requires a management system that is connected to other systems(Rounaghi). Awareness of this eventually led to the development of a new accounting system methodology designed to determine the impact of human activities on the ecological system and the earth's resources (Greenham). The accounting information system which is part of the management information system can also play an influential role to help protect the environment in order to avoid waste pollution from manufacturing companies(Rounaghi). With this deepening public concern, the authenticity of accounting information is not the only thing of concern, but the public also sees from the side of companies that can or cannot contribute to protecting the environment, with this green accounting begins to emerge slowly(Ma and Ma).

Accounting itself is a summary, clarification, identification, and measurement of economic events that produce financial data in the form of numbers and can be used to make decisions (Putra et al.). Meanwhile, green accounting is a new accounting system in which the company's financial results contain environmental costs (Rounaghi). Environmental costs themselves also include external and internal costs or any costs related to the environment (Adi et al.). Green accounting is one of the more effective economic indicators of the human environment and the protection of natural resources (Lin et al.).This is a new type of accounting which seeks to consider the environment and its welfare and take into account the economic costs to calculate the income of their company (Singh et al.).

The aim of pursuing this kind of accounting is to enable us to judge whether responsible human activities are sustainable(Greenham). In addition, other benefits of green accounting are very beneficial, namely being able to predict problems that will arise in the future, helping to monitor the implementation of sustainable development, helping to improve the analysis of development policies, and accountability for natural resource management(Utama). For a longer period, the application of green accounting will be of great benefit to all parties such as entrepreneurs, consumers, investors, and society, because companies will incur environmental costs early in time which can reduce the potential for greater expenditures in the future(Zulhaimi). As a new cross-cutting field of environmental science, accounting, and economics, green accounting has been widely noticed by scholars and the general public(Ma and Ma).
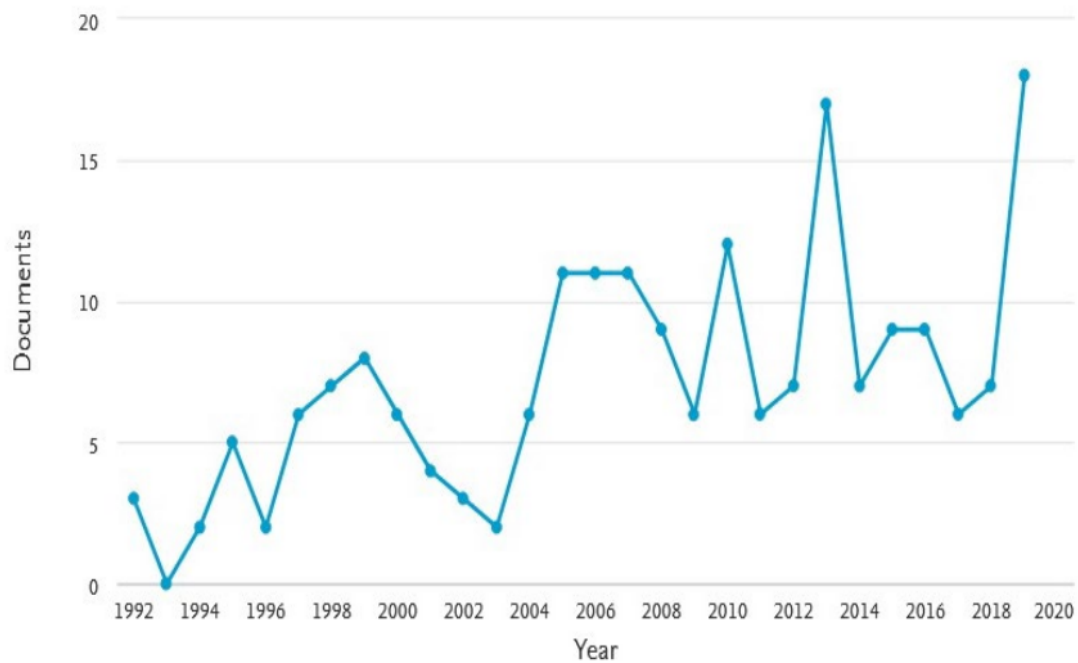

Figure 1. Number of Documents Per Year from the Green Accounting Study

However, a previous study related to Green Accounting is generally limited in one field(Figueroa B. et al.), one country(Ying et al.), (Zhao and Liu). Unfortunately, although it presents a broad image map visualized from year to year with details from several studies published on a global scale, there are not many studies on Green Accounting. The strong positive relationship regarding affiliation, scholars, and the impact of scientific studies has also not been explicitly addressed by any study. We monitor the increase in the number of Green Accounting related scholarly documents published as well as indexed by Scopus since 1992 through 2019 as seen in Figure 1.

2. Research Methods

This review mapped the status of the study conducted in the last 27 years at the global level on the basis of Green Accounting. In August 2020, this study collected data from the scopus utilizing document search queries (Susanti and Purnomo). The research was carried out using scientometric techniques. Data analysis as well as visualization utilising VOSViewer program and the Scopus function for analyze search results(Purnomo, Y. K. P. Sari, et al.; Purnomo, A. K. Sari, et al.).

This study identifies Green Accounting keywords to recognize and look for Scopus database publications with 200 globally published documents from 1992 through 2019. The research confined collection of data to 2019 and excluding 2020. TITLE-ABS-KEY ("Green Accounting") AND PUBYEAR <2020) is the query input command which is implemented while mining academic publication data on online database of Scopus.

The study applies a co-authorship analysis with authors' analysis units and full calculation systematic techniques utilizing VOSViewer to gain the collaboration research network of the international researcher. The study conducted an in-depth co-occurrence analysis with keyword relation analysis as well as a full systematic technique of calculation utilizing VOSViewer to generate a keyword map network

3. Result and Discussion

Green Accounting publications appear to be likely to increase and grow per year. The tallest point for international publication was 18 documents in 2019. Since 1992, publishing on Green Accounting has already started.

3.1 Green Accounting Study Most Common Organizational Affiliations

The most productive research affiliate in the Green Accounting study is McGill University with 17 documents. Then, followed by the The leading research organizations in Green Accounting study was McGill University with 17 documents. Then followed by US EPA National Risk Management Research Laboratory, University of Bath, Umeå Universitet, Yale University, United States Environmental Protection Agency, Bergische Universitat Wuppertal, and Fondazione Eni Enrico Mattei as shown in Figure 2.
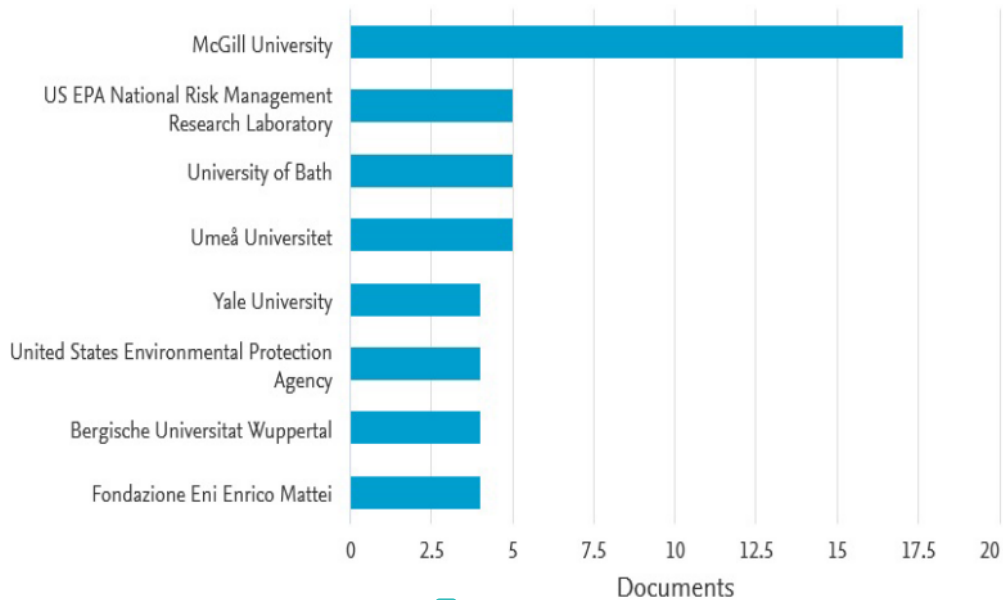
Figure 2. Organizational Affiliation Number of Annual Publication of Green Accounting

3.2 Green Accounting Publications Most Individual Researcher

The researcher in the area of Green Accounting to the most writings was Cairns, R.D. 15 documents with it. Pursued by Bartelmus, P., with 7 documents.
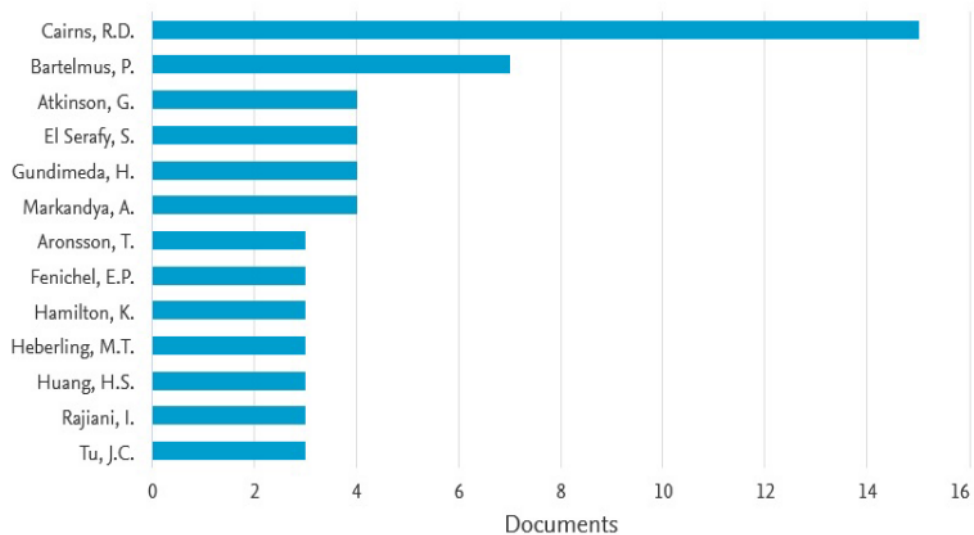
Figure 3. Most individual Green Accounting Publication Researcher

3.3 Green Accounting Publications Most Common Nation

In Green Accounting publications, the United States with 44 academic documents was the leading research nation. Then, with 28 articles, the United Kingdom followed.
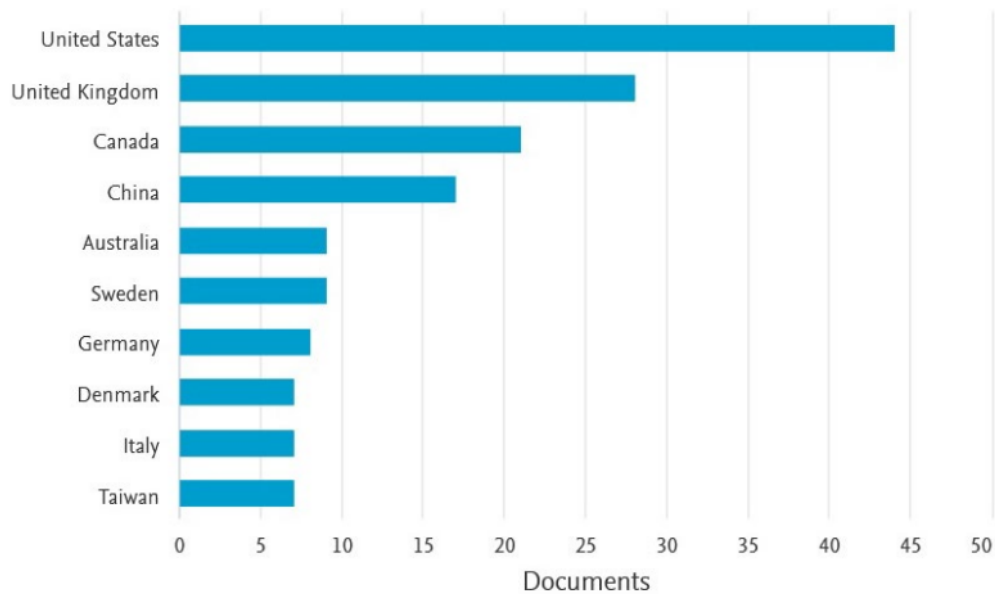
Figure 4. Nation Number of Annual Publication of Green Accounting

3.4 Most Frequency of Green Accounting by Subject Area

With 114 documents (28.8%), Environmental Science in the subject area was the most frequent subject area in international publications on Green Accounting, followed by Economics, Econometrics and Finance with 90 documents (22.7%), Social Sciences with 52 documents (13.1%), Business, Management and Accounting with 39 documents (9.8%), Energy with 22 documents (5.6%). Agricultural and Biological Sciences with 18 documents (4.5%), Engineering with 18 documents (4.5%). Decision Sciences with 12 documents (3.0%), Earth and Planetary Sciences with 10 documents (2.5 %%). Computer Science with 5 documents (1.3%), and others as many as 4%.
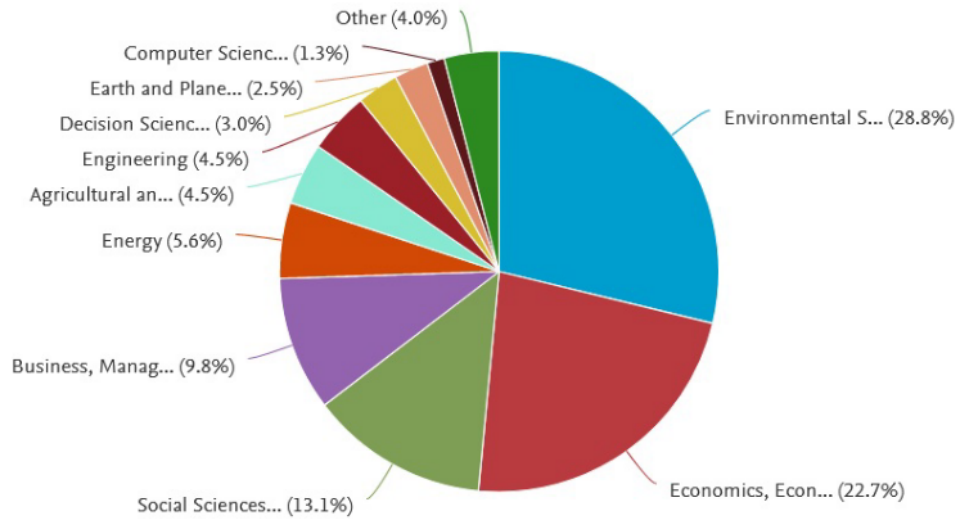

Figure 5. The Largest Frequency of Publication of Green Accounting by Subject Area

3.5 Year Documents of Green Marketing Publication Sources

The leader in the annual number of sources of Green Accounting publications is the "Ecological Economics" with 22 documents, then followed by Environmental and Resource Economics with 7 documents, "Journal of Environmental Economics and Management" with 6 documents, "Critical Perspectives on Accounting" with 5 documents, "Environment and Development Economics" with 5 documents.
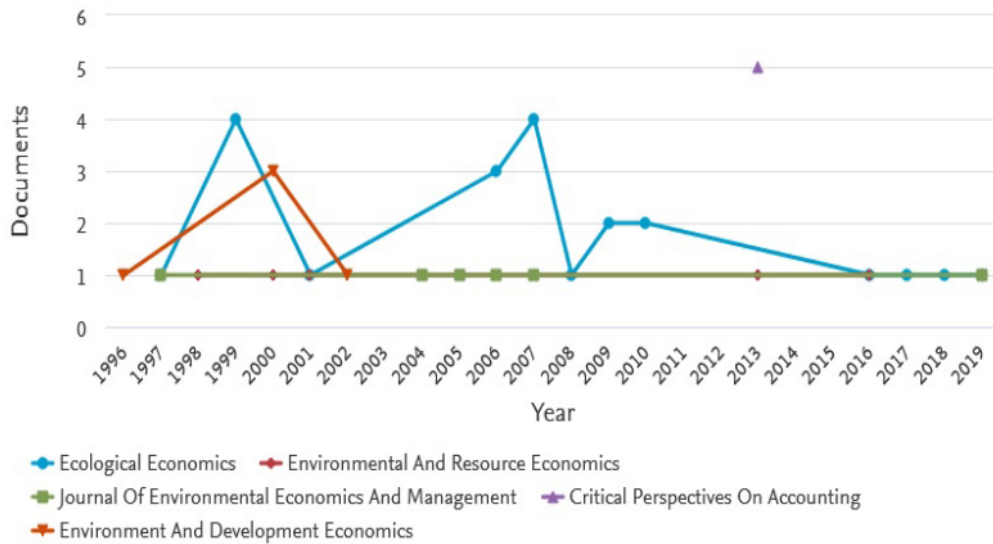

Figure 6. Number of Annual Documents Based on the Green Accounting Studies Sources

3.6 The Green Accounting Publication Article Cited

The study of Heesup Han, Li-Tzang (Jane) Hsu, Lee-Soo Lee, and Yunhi Kim was the most widely cited publication, in 2010 entitled "Understanding how consumers view green hotels: how a hotel's green image can influence behavioral intentions" with cited by 386 documents (Lee et al.).
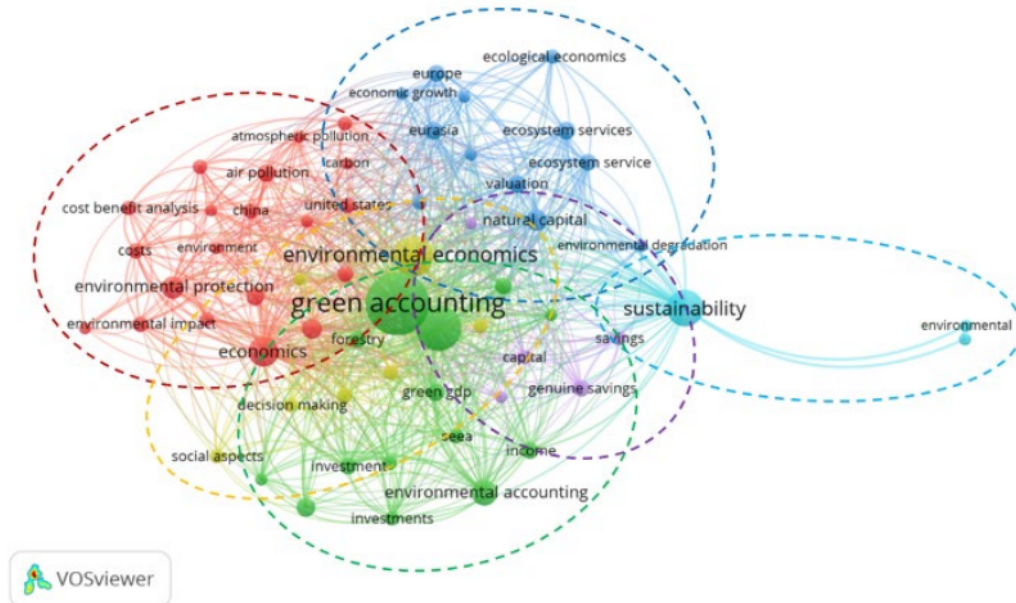
3.7 Map of Study Themes

Figure 7. Map of Study Themes

With analysis and visualization of the VOSViewer program, construction was developed on the Green Accounting keyword framework for the Green Accounting of publication theme map. Five repetitions were the criterion for the minimum amount of keyword-related documents. Therefore, 61 keywords among 1.081 keywords reached the thresholds. From Figure. 7 there were six publication theme groups dependent on study keywords regarding the international academic publication of Green Accounting, simplified as well as abbreviated as SSSEEA themes.

1. Social Cluster (yellow). The keywords of the social aspect, decision making, and environmental economic dominated this cluster.
2. Sustainable Cluster (light blue). The keywords of sustainability and environmental dominated this cluster.
3. Savings Cluster (purple). The keywords of genuine savings and capital dominated this cluster.
4. Environmental Cluster (red). The keywords of environmental protection, environmental impact, water pollution, and atmospheric dominated this cluster.
5. Economic Cluster (dark blue). The keywords of economic growth, ecological economics, natural capital dominated this cluster.
6. Accounting Cluster (green). W The keywords of Green Accounting, environmental accounting, sustainable development, green GDP, investment, income dominated this cluster
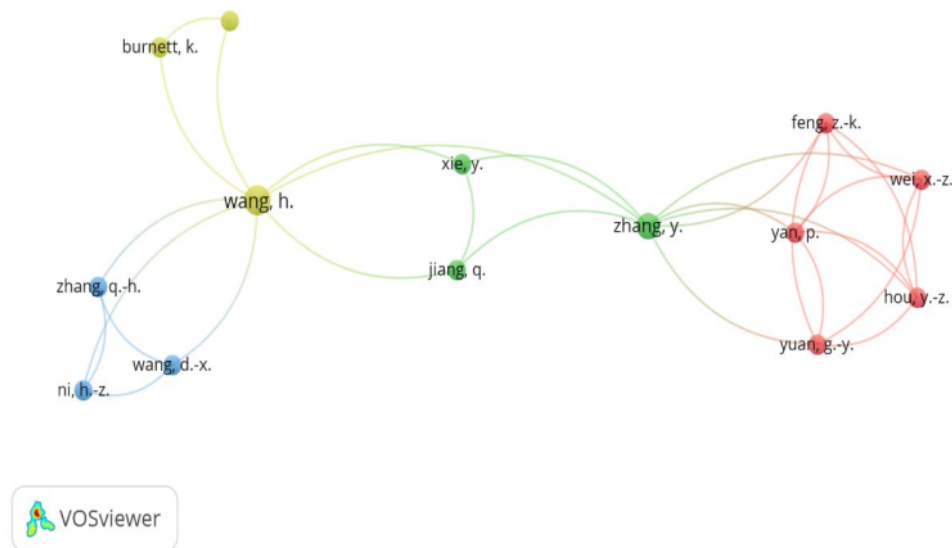
3.7 Map of Study Themes

Figure 8. Author Collaboration Network

With the VOSViewer program, construction was developed on the Green Accounting researcher framework for the authorship network map. One document was one of the requirements for the minimum collection of publications per author. Thus, out of 344 researchers, 334 researchers who reached the thresholds were recognized. As shown in figure 8, there were four group partnership networks between international researchers in Green Accounting publications. There is a collaboration between Burnett K., and Wang H., such as with the study title "Environmental resources and economic growth"(Roumasset et al.). Also, there is also a collaborative writer between Ni H.-Z., Wang D.-X., and Zhang Q.-H. such as with the study title "Water pricing of Beijing based on water resources green accounting"(Hong-Zhen et al.). Likewise the author's collaboration between Zhang Y., Jiang Q., and Xie Y., such as with the study title "Grain pricing in the Huanghuaihai Plain based on green accounting"(Zhang et al.). And the author's collaboration between Hou Y.-Z., Wei X.-Z., Yan P., Yuan G.-Y., Feng Z.-K. such as with the study title "Green accounting for forests in Beijing"(Y et al.).

4. Conclusion

The results of this research revealed that there is an annual trend towards a spike in the amount of international publications on Green Accounting, there were maps and visual patterns. With 44 papers, the United States was the country with the greatest contribution to publications in Green Accounting studies. In the publication of the Green Accounting, McGill University was the most active research institution with 17 papers. In the Green Accounting publication, the individual academic researcher with the most prolific publications was Cairns, R.D. 15 papers with it. With 114 documents (28.8%), the most intensively studied areas published in the Green Accounting publication were Environmental Science. The "Ecological Economics" with 22 documents was the majority of annual documents by the source in the Green Accounting publication. With 18 papers, the highest publication of worldwide scholarly publications in Green Accounting studies was in 2019. The works of Heesup Han, Li-Tzang (Jane) Hsu, Lee-Soo Lee, and Yunhi Kim were mostly publications with the most citations. In 2010, the cited 386 documents entitled "Understanding how consumers view green hotels: how a hotel's green image can influence behavioral intentions". There were four researcher partnership groups linked to the publication of Green Accounting.
In terms of contributing knowledge implications, this study recommends a classification of the convergence axis comprising of publication in Green Accounting to classify the body of knowledge created from twenty-seven years of academic publication: Social, Sustainable, Savings, Environmental, Economic, Accounting, abbreviated as SSSEEA themes. The identification of key themes in the Green Accounting area, as practical implication, contributes to an

awareness of the creation of practical studies to clarify general contexts and topics, as well as research gaps. All this will lead to fresh research addressing a lack of study and specialized expertise in the disciplines. The most studied themes often reflect the ability to contribute to Green Accounting to economic and environmental growth.

Acknowledgments

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