A Bibliometric Analysis of Green Banking: Evidences from the Last Decade

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Abstract

Growing global concern about climate change, greenhouse gas emissions, industrial pollution control, waste management, and environmental protection has piqued countries' and policymakers' attention to innovative financial products and services used to address a broader range of environmental concerns. So, Green Banking has drawn a lot of interest due to the surge in environmental awareness. This study tries to discover several aspects of green banking research. The authors conducted a bibliometric review of green finance from 2014 to 2023 using the Scopus database to determine the current trend and progress in the subject. The paper gives a comprehensive bibliometric study that includes inputs that other scholars on this topic have not considered. The R software was used to graphically assess the data and find co-occurrence patterns as well as important research themes. The graphical and systematic mapping depicts the progression of publications through time and identifies current research topics of interest. The findings suggest that green finance research has gained popularity since 2014. The analysis provides a complete overview of green banking-related research, allowing academics and policymakers to better assess patterns and future directions. The current work focuses on document publications year-wise, document categories, document subject areas, the most significant articles, citation of papers, various journal sources, and the co-occurrence of green banking keywords.

Keywords: Banking, Green Economy, Sustainable Development, Bibliometric Analysis

1. Introduction

Environmental protection is receiving more attention as a result of global warming, which also directly affects human health, agriculture, forestry, dry land, and water supplies (S M Mahfuzur & Barua, 2016). As humans are the only distant entity that needs safeguarding, environmental protection is a concern shared by all of humanity. Environmental degradation results in global warming and climate change, which cause lake bursting and sea level rise as well as the melting of Himalayan glaciers and other natural calamities including floods, landslides, and storms (Ahmad, Zayed & Harun. 2013; Devkota & Phuyal, 2015, 2017). Human activities that are unregulated and harmful to the environment have contributed to climate change and other negative consequences for the ecosystem. The major challenge of our time is determining how to create a flourishing economy without negatively impacting environmental systems (Alsmadi et al., 2023).

2. Background of Study

Green banking is rapidly becoming a global standard for embracing ecologically and socially conscious corporate practices. In order to reduce the carbon emissions produced by their operations and to actively contribute to the conservation of the environment, banks and other financial institutions have adopted "green" projects (Risal & Joshi, 2018). This banking is ecologically friendly because it prevents environmental deterioration and makes the earth livable again. Green banking has become a buzzword in

the field of sustainable banking in the past couple of decades. In reality, green banking is known to be ecological banking, which helps to safeguard the environment while also ensuring long-term economic growth. Increasing attention of policymakers, governments and regulating authorities towards climate change and global warming has pushed the substantial need to properly review the current practices of green and sustainable finance. Recent years have seen a significant increase in interest in green banking due to growing environmental concerns. Since the banking sector plays a unique intermediation function that is crucial for directing financial resources towards sustainable goals, it is critical for attaining sustainable development.

3. Scope and Significance of Study

Green banking has gained popularity in the field of sustainable banking during the past few decades. In actuality, sustainable banking is known as green banking and contributes to preventing environmental harm with the aim of ensuring long-term economic growth (Islam et al, 2020). Unbalanced industrialization has affected the ecosystem and led to disasters both natural and man-made (Rehman Khan & Yu, 2021) .Researchers have defined green banking in a variety of ways, but the general emphasis has been on full banking systems that provide substantial growth in the economy while simultaneously promoting environmentally friendly practices (Mozib Lalon, 2015). Green banking requires banks to play a larger role in combating climate change (Sarker et al., 2019), (Stephens & Skinner, 2013). Green Banking is a crucial component of green finance, which is a broad term. Climate change mitigation and environmental protection are covered by "green banking," which includes investments in ecological products and services (Lindenberg & Volz, 2016). Two aspects of green banking are involved: first, the method that banking is conducted, i.e., whether it is paperless or not, and second, where the bank invests its funds.(Sarma & Roy, 2021)

The aim of this study is to draw attention to the current state of Green Banking study. In this study, the study identifies and analyses the major research dimensions, trends, geographic distribution, and research sources pertinent to green banking. The aim of the study is to comprehend the present situation of green banking study. This study is pertinent in light of the considerable interest that Green Banking has attracted from many economic actors. Several parties will gain from the study's findings, starting with academics and reviewers who are proficient to select future green banking research subjects and legislators who can use them to introduce green banking research criteria. The report will also help communities all across the world to understand their position.

4. Literature Review

This section makes an effort to related studies that have been done in this field. Scientometric studies/bibliographic studies map the existing condition of a research area to inform scholars of their alternatives for extending their future research in a certain sector. Previous literature has concentrated on particular aspects of green banking. Some have emphasized the conceptual aspect (Zhelyazkova & Kitanov, 2015). (Zhelyazkova & Kitanov, 2015), whereas some people have concentrated on the pros and downsides of green banking (Kapoor et al., 2016) The goal of the current study is to conduct a bibliometric analysis to examine the development and trend of the idea of green banking. The Scopus database is used to survey academic literature from 2014 to 2023. Bibliometrix R Package is used to analyse the chosen articles' intellectual content and bibliography. To statistically assess linked papers found on Scopus, a bibliometric evaluation was done.

Results indicated that although interdisciplinary, green banking is still a relatively young field of study. Following the extraction procedure for the bibliometric analysis, a number of significant papers were chosen based on regional and international citations for content analysis. The researcher was able to pinpoint the top research directions and trends through the content analysis. They tried studying various elements of document publications year-wise, document categories, document subject areas, the most significant articles, citation of papers, various journal sources, and the co-occurrence of green banking keywords. The Scopus database is used to assess the scholarly literature from 2014 to 2023.

Using the Bibliometrix R Package, the intellectual structure and bibliographic analysis of the chosen articles are performed. To ensure accuracy in the results obtained, a number of inclusion and exclusion criteria are applied and a total of 103 documents were chosen for a thorough examination and assessment of the material.

5. Objectives of Study

The study's research goals are listed below:

- To recognize many study facets on green banking
- To examine the expansion of research into green banking
- To examine the geographic distribution of green banking research
- To pinpoint important sources of green banking research
- To do keyword research on the literature on green banking

6. Results and Discussion

- **Analysis based on Annual Scientific Production**

The annual output of academic papers on green banking is displayed in Table 1 and fig. 1. However, the needed growth in publications is only seen between 2021 and 2022, whereas prior times (2014 -2019) were rather sluggish. Publications have been dramatically increasing in recent years. Academic scholars have recently begun to concentrate on green banking trends. As a result, it is clear that the research contributions are helping green banking and its industry advance. As a result, it can be concluded that green banking and its sphere are shaping upwards through the research contributions.

Year	Articles
2014	3
2015	3
2016	9
2017	2
2018	9
2019	8
2020	12
2021	22
2022	27
2023	8

Table 1: Documents year wise
Source: Biblioshiny through R studio and Scopus Database

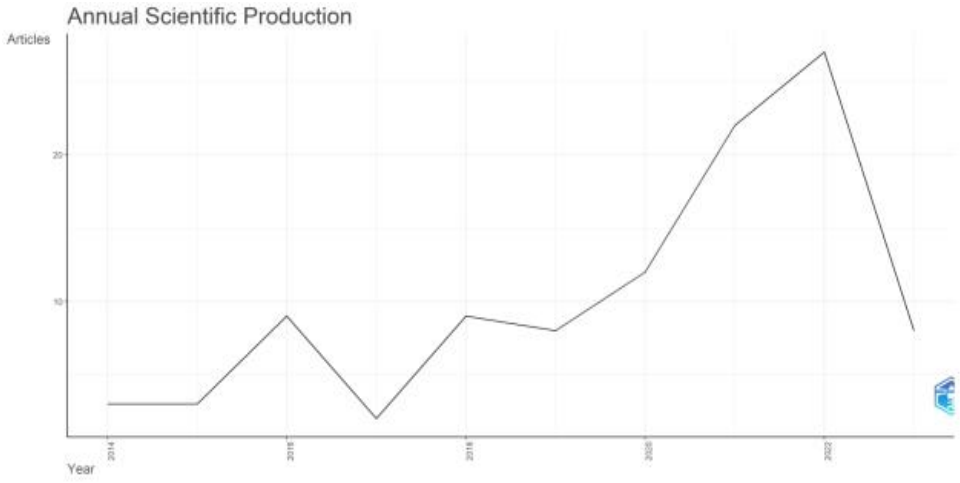

Fig. 1: Document Year Wise
Source: Biblioshiny through R studio and Scopus Database

- **Average Citation per Year**

The citation analysis, presumes that citations reproduce intellectual contributions and influence the research horizons. By counting the citations that each published piece of work receives, this research illustrates the impact of those works. As a result, it makes it possible to find the most significant and useful papers inside a study element. This makes it possible to gain understanding of the intellectual dynamics of that constituent. The top 10 influential documents in the subject of green banking are listed in Table 2 and Figure 2:

Average Citation per Year				
Year	**MeanTCperArt**	**N**	**MeanTCperYear**	**CitableYears**
2014	7.67	3	0.77	10
2015	9.33	3	1.04	9
2016	34.11	9	4.26	8
2017	6.5	2	0.93	7
2018	17.22	9	2.87	6
2019	32.38	8	6.48	5
2020	16.25	12	4.06	4
2021	20.36	22	6.79	3
2022	.37	27	3.18	2
2023	1.38	8	1.38	1

N = number of publications
MeanTCperArt = average total citations per article
MeanTCperYear = average total citations per year

Table 2: Average Citation Per Year
Source: Biblioshiny through R studio and Scopus Database

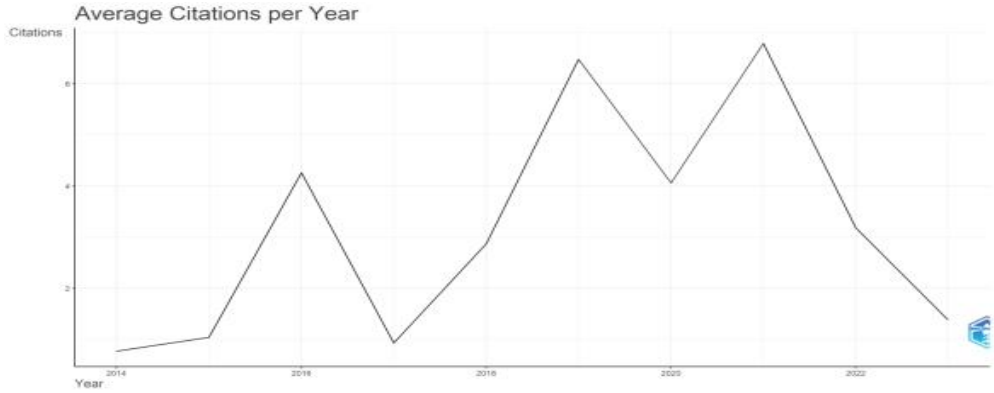

Fig. 2: Average Citation Per Year
Source: Biblioshiny through R studio and Scopus Database

- **Analysis based on Mapping of Research Outlets (Journals)**

The direction of green banking research can be understood by mapping research outlets (journals) that actively publish publications on the topic. This study included 102 journal articles in total, and journals from each of them were mapped to identify the pertinent ones. It is obvious that 7 of the 10 pertinent journals are environment-related periodicals as shown in Table 3 and Fig. 3 Despite the fact that the topic is related to banking, it is evident that environmental publications are more proactive when it comes to writing about green banking.

Most Relevant Sources	
Sources	**Articles**
ENERGY ECONOMICS	7
BUSINESS STRATEGY AND THE ENVIRONMENT	6
ENVIRONMENT, DEVELOPMENT AND SUSTAINABILITY	6
INTERNATIONAL JOURNAL OF GREEN ECONOMICS	4
ECOLOGICAL ECONOMICS	3
ECONOMIC RESEARCH-EKONOMSKA ISTRAZIVANJA	3
JOURNAL OF CLEANER PRODUCTION	3
QUALITY - ACCESS TO SUCCESS	3
ECONOMIC ANALYSIS AND POLICY	2
ECONOMIC CHANGE AND RESTRUCTURING	2

Table 3: Most Relevant Sources
Source: Biblioshiny through R studio and Scopus Database

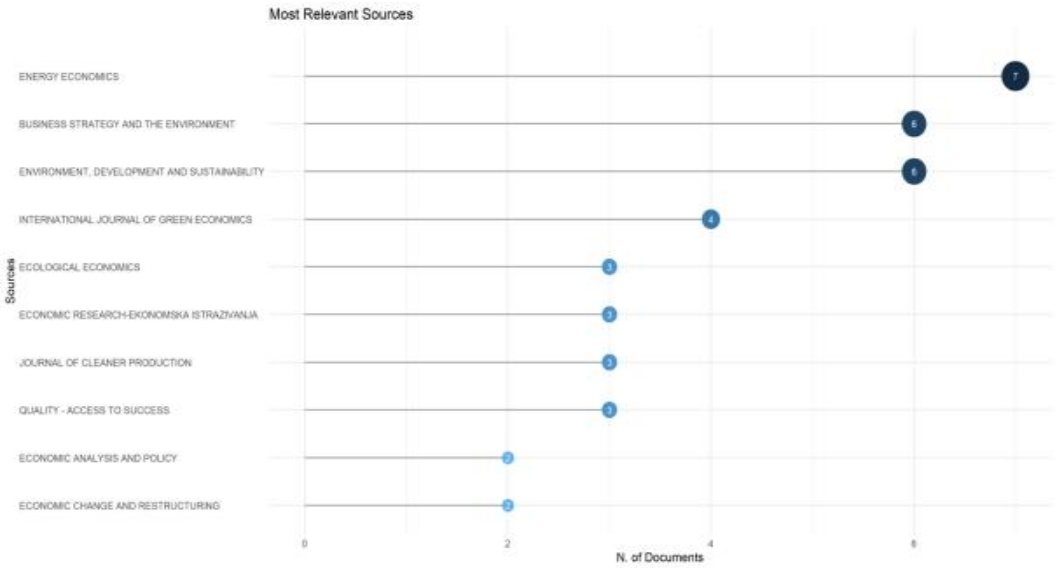

Fig. 3: Most Relevant Sources

Source: Biblioshiny through R studio and Scopus Database

- **Analysis based on Most Relevant Authors**

Table 4 and Fig. 4 contain the results of most frequent publishers in green banking. It shows that Bukhari SAA and Hashim F with 4 publications each.

Authors	Articles
BUKHARI SAA	4
HASHIM F	4
AMRAN A	3
KUMAR K	3
MIAH MD	3
NISHA N	3
PRAKASH A	3
ROY A	3
SARMA P	3
AFZAL A	2

Table 4: Most Relevant Authors
Source: Biblioshiny through R studio and Scopus Database

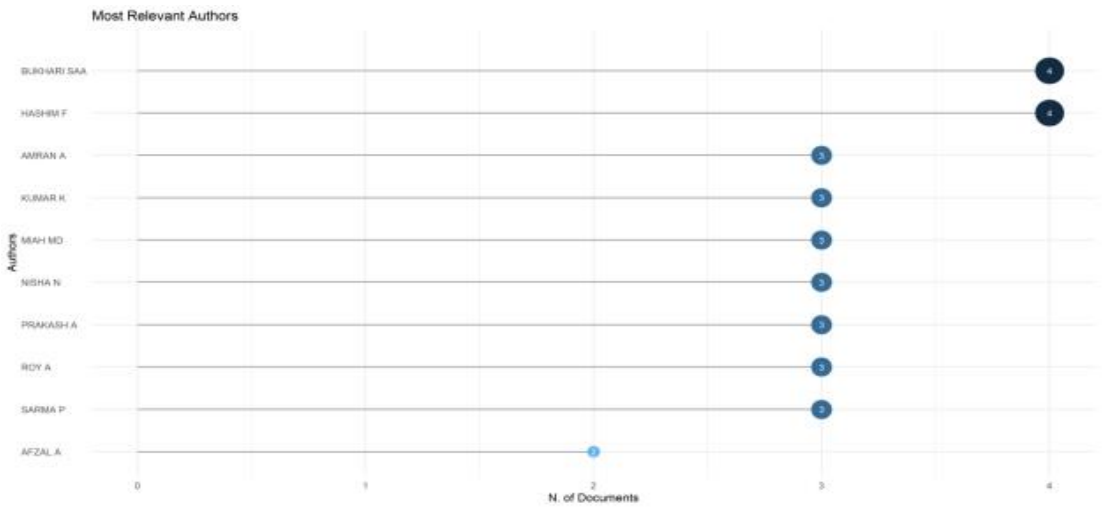

Fig. 4: Most Relevant Authors
Source: Biblioshiny through R studio and Scopus Database

- **Analysis based on Key Words**

The theme of research articles is reflected in the keywords, which are crucial for indexing research publications. We could learn useful information about the primary research interests of researchers in a specific topic by looking at keyword data. Fig. 5 exemplifies the top three research interests (keywords), which are green banking, sustainable development, and the financial system.. Protecting the environment and promoting sustainable development are the goals of green banking. The other keywords reveal some intriguing trends as well. Climate change and environmental sustainability are both impacted by green banking. A crucial component of green finance is green banking. Recent years have seen a rise in the popularity of green banking, which now plays a significant role in corporate social responsibility. Environmental, social, and governance issues are all covered by sustainable banking, which includes green banking as a significant component.

Fig. 5: Keywords
Source: Biblioshiny through R studio and Scopus Database

- **Analysis based on Word Cloud**

Table shows the occurance of words. Table 5 lists the 10 most popular keywords in this field of green banking. The top three themes in the literature were banking, China and sustainable development.

Words	Occurrences
Banking	33
China	14
Sustainable Development	12
Financial System	11
Environmental Economics	10
Green Economy	10
Environmental Policy	9
Credit Provision	7
Energy Efficiency	7
Finance	7

Table 5: Word Cloud
Source: Biblioshiny through R studio and Scopus Database

- **Analysis based on Co-Occurrence of Authors' Keywords**

This section assesses the material related to the keywords, which is a useful resource for identifying pertinent writing and movements. Keep in mind that the keywords we looked for were based on the textual information found in articles. Additionally, the co-occurrence is based on how frequently two keywords occur next to one another.to determine trends within the examination's content, the researchers in the study used keyword analysis. The most often occurring keyword combinations, as shown in Figure 6 are connected to banking, environmental economics, the financial system, and sustainable development. The findings give academics more clarity about the most popular search terms for upcoming works.

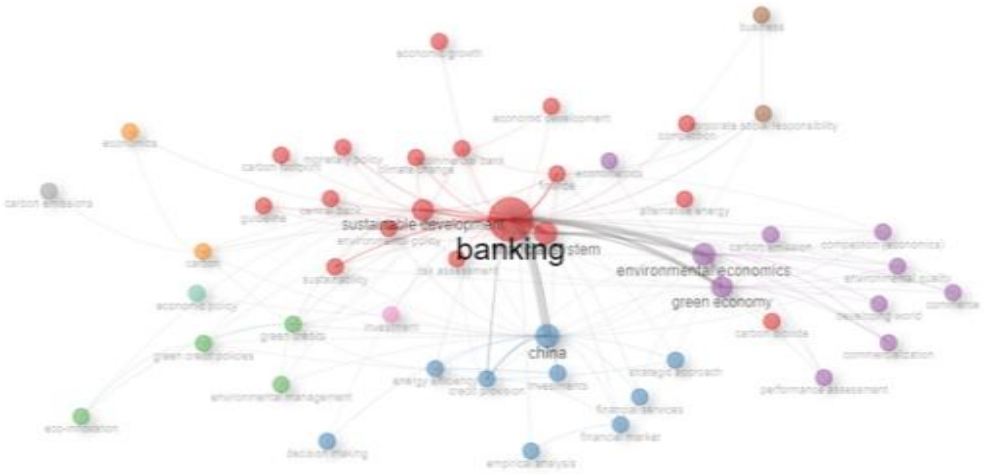

Fig. 6: Co-Occurrence of Authors' Keywords
Source: Biblioshiny through R studio and Scopus Database

- **The Thematic Map: A Co-Word Analysis**

The researchers used a bibliography collection of R Studio to create a theme chart. The mapping method draws attention to the important issues that the journal covered. According to the placements and levels of the topics on the X and Y axes, were plotted in four quadrants as shown in Fig. 7. The dominant metric demonstrates the significance of green connections throughout the entire research. In contrast, density decides how far articles evolve in accordance with the inherent strengths of the network.

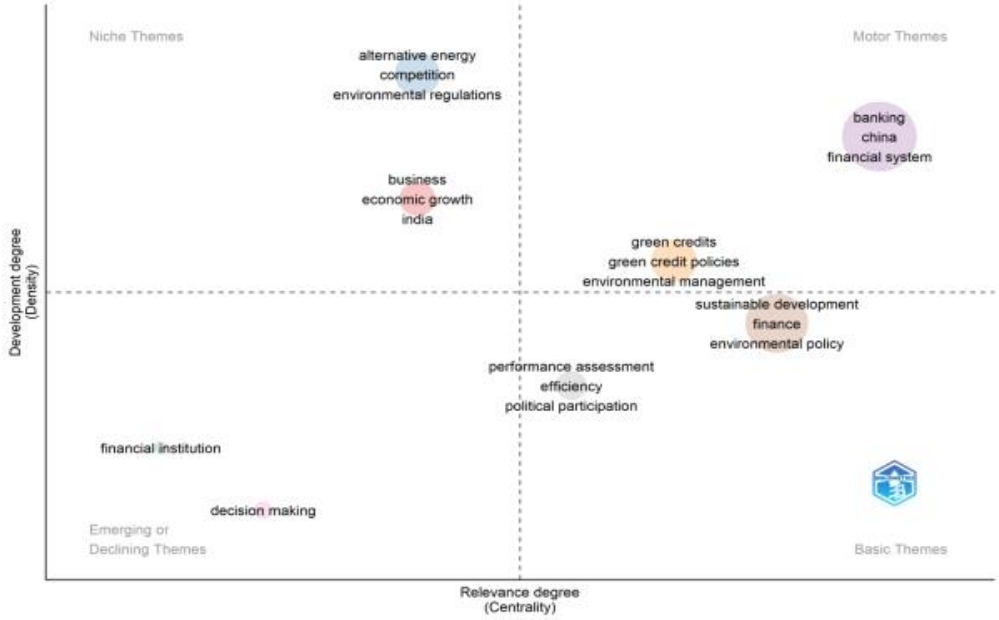

Fig. 7: The Thematic Map: A Co-Word Analysis
Source: Biblioshiny through R studio and Scopus Database

7. Discussion and Conclusion

Evaluating significant topics in the study area is the purpose of this paper. By analyzing the topics and trends covered up to 2022, the current gaps might be used as potential areas for research. The patterns have been demonstrated by the study. It became clear that a research agenda already exists after examining the earlier results. However, more investigation into entrepreneurial spirit, long-term viability and the emerging economy is necessary. Green banking has proven to be highly valuable and relevant in an expedient manner. Finally, the main goal of this research was to use a most popular approach called bibliometric analysis to give academics and industry professionals a comprehensive analysis of green bonds and ecologically conscious for the years (1995–2022).This was accomplished by using literature that has been published in periodicals that are included in the database maintained by Scopus.

8. Limitations

The survey's focus on the bibliographic evaluation from the Scopus database is one of the study's shortcomings. The data set has a number of flaws that have reduced the research's applicability across the all domains. Failures are books like preprint books, Google books, and conference proceedings that aren't well covered in the Scopus database. Additionally, it excludes works that were released in tongues other than English. Furthermore, there is a good likelihood that not all articles included in the Web of

Science indices are covered by the study. In addition, figures from other sources, such as the science website, were not included in the study. The whole temporal analysis—for instance, periodic analysis to gauge the evolution of green banking over time—would have been useful in figuring out how the trends in the green banking literature evolved.

9. Implications

The study has management ramifications as well. Future research on green banking will be made easier by the study's findings. This work has drawn attention to the possibilities of undertaking future research by integrating various Green Banking research facets. International organizations are urged by this study to make stronger efforts in the area of green banking. Additionally, there is an appeal made to the editors and publishers of financial periodicals to try incorporating green banking into the scope of their respective publications and publish more studies on the topic.

References

[1] Alsmadi, A. A., Al-Okaily, M., Alrawashdeh, N., Al-Gasaymeh, A., Moh'd Al-hazimeh, A., & Zakari, A. (2023). A Bibliometric Analysis of Green Bonds and Sustainable Green Energy: Evidence from the Last Fifteen Years (2007–2022). *Sustainability*, *15*(7), Article 7. https://doi.org/10.3390/su15075778

[2] Sarma, P., & Roy, A. (2021). A Scientometric analysis of literature on Green Banking (1995-March 2019). *Journal of Sustainable Finance & Investment*, *11*(2), 143–162.

[3] Islam et al. (2021) A Review on Corporate Environmental Reporting (CER): An Emerging Issue in the Corporate World. *Canadian Journal of Business and Information Studies*, 45–53. https://doi.org/10.34104/cjbis.020.045053

[4] Lindenberg, N., & Volz, U. (2016). *Green Banking Regulation: Setting Out a Framework* (SSRN Scholarly Paper No. 2881919). https://papers.ssrn.com/abstract=2881919

[5] Mozib Lalon, R. (2015). Green Banking: Going Green. *International Journal of Economics, Finance and Management Sciences*, *3*(1), 34. https://doi.org/10.11648/j.ijefm.20150301.15

[6] Rehman Khan, S. A., & Yu, Z. (2021). Assessing the eco-environmental performance: An PLS-SEM approach with practice-based view. *International Journal of Logistics Research and Applications*, *24*(3), 303–321. https://doi.org/10.1080/13675567.2020.1754773

[7] Risal, N., & Joshi, S. K. (2018). Measuring Green Banking Practices on Bank's Environmental Performance: Empirical Evidence from Kathmandu valley. *Journal of Business and Social Sciences*, *2*(1), Article 1. https://doi.org/10.3126/jbss.v2i1.22827

[8] S M Mahfuzur, R., & Barua, S. (2016). *The Design and Adoption of Green Banking Framework for Environment Protection: Lessons from Bangladesh* (SSRN Scholarly Paper No. 2854072). https://papers.ssrn.com/abstract=2854072

[9] Sarker, M. N. I., Khatun, M. N., & Alam, G. M. (2019). Islamic banking and finance: Potential approach for economic sustainability in China. *Journal of Islamic Marketing*, *11*(6), 1725–1741. https://doi.org/10.1108/JIMA-04-2019-0076

[10] Stephens, C., & Skinner, C. (2013). Banks for a better planet? The challenge of sustainable social and environmental development and the emerging response of the banking sector. *Environmental Development*, *5*, 175–179. https://doi.org/10.1016/j.envdev.2012.11.011

[11] Zhelyazkova, V., & Kitanov, Y. (2015). Green Banking-Definition, Scope and Proposed Business Model.