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Research Article

Green Banking Evolution: A Bibliometric Study on Trends and Patterns

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Abstract: The practice of financial organisations implementing socially and environmentally responsible strategies is known as "green banking." It entails offering financial services and products to promote eco-friendly projects. Green banks use energy-efficient operations and reduce paper waste, among other measures, to lessen their environmental effect. By incentivising consumers and businesses to adopt eco-friendly activities, they want to encourage sustainability. Ultimately, green banking unites the banking industry with initiatives to mitigate climate change and save natural resources. (Karthikeyan et al.,2018) Green banking practices are defined as electronic goods and services promoting environmentally friendly activities, such as electronic waste management systems, power consumption reduction, and eco-friendly operations. (Ganesan et al.,2016) Although the banking industry is not thought to be polluting, change is urgently needed. Green banking is a broad approach that integrates environmental factors into every facet of the banking sector. This study has taken Scopus as a citation database to conduct the bibliometric analysis.

Keywords: Green Banking; Green Practices; Green Initiatives; Bibliometric analysis; Biblioshiny; VOS viewer.

INTRODUCTION

Banks can significantly address ecological issues and facilitate a sustainable future by encouraging sustainable investments, offering eco-friendly products, improving operational efficiency, and engaging with stakeholders. Green banking aims to combine financial services with environmental sustainability, marking a paradigm shift in the banking sector. The idea includes a range of methods and approaches intended to promote sustainable development without sacrificing economic feasibility. Green finance has its roots in the growing understanding of how economic activity affects the environment. According to Abdul Gafoor et al. (2024), the development of green finance research shows an increasing trend toward comprehending and implementing environmentally friendly banking procedures to increase sustainability. This change is also evident in the numerous programs and guidelines that banks have implemented to match their business practices with environmental goals (Akhtar & Anjum, n.d.).

According to Chen et al. (2022), financial institutions are essential to the green recovery. They can achieve this by offering financial services and solutions that promote environmentally friendly company and consumer practices. Green bonds and loans, for example, are cutting-edge financial products made to support initiatives with favourable environmental effects.

According to Donthu et al. (2021), there has been an essential surge in scholarly interest and publications, suggesting a rising understanding of the significance of incorporating environmental considerations into financial decision-making. The bibliometric study of research on green banking done over the past ten years further emphasises the significance of this field.

Another essential element in green banking's effectiveness is how customers view it. Customers are becoming more conscious of and inclined toward environmentally friendly banking practices, as noted by Ganesan and Bhuvaneswari (2016). To meet the need for sustainability, banks are forced to innovate their services and embrace greener practices due to this shift in consumer behaviour.

Furthermore, leadership philosophies, staff involvement, and green HR management techniques are critical to the banking industry's ability to execute green banking initiatives successfully. According to Noor et al. (2023), leadership supporting sustainability and involving staff members in green projects is essential to achieve significant environmental results.

Green banking is not merely a fad but an essential shift in the financial sector required to meet the urgent environmental issues of our day. Banks may satisfy the changing demands of their clients, improve their

competitive edge, and support sustainable development by implementing green practices.

REVIEW OF LITERATURE

To fill the gaps in the earlier research, this section examines the patterns and trends of green banking practices followed by banks. A review of the literature on green banking goods and services is discussed.

(Nachaal et al.,2023) Green banking has quickly shown to be extremely important and valuable. The primary objective of this study was to provide academics and business professionals with an extensive analysis of green bonds and environmentally conscious companies over time using a widely used technique known as bibliometric analysis. (1995–2022). (Gafoor et al.,2024) Even though the keyword "green finance" first surfaced in academic writing, from 2022 onward, research has increased exponentially. China is the leader in green finance research among the nations, both in independently published and internationally coauthored works. Most papers on the multidisciplinary topic of "green finance," which combines environmental sciences with finance, are published in journals focusing on sustainability and the environment. (Prabhu et al.,2023) the applicability of ABCD analysis to green banking practices and consumers' intentions to green products was examined based on a Comprehensive analysis of the literature on ABCD quantitative analysis and qualitative listing. The nature of this study is empirical, and results were found using factor analysis and elementary analysis. (Noor et al.,2023) Offered new insights into how transformational leadership behaviours and green HRM practices interact with institutional and contextual elements to enhance employee engagement. (Chen et al.,2022) determined how Green Banking (GB) practices affected green financing sources and the performance of Bangladeshi private commercial banks' (PCBs'). The empirical outcomes found that, in contrast to banks' customer-related GB practice, which was not statistically significant, employees, daily operations, and policy-related GB practices significantly positively impact green financing. Furthermore, banks' environmental performance showed a high and favourable correlation with their funding of green projects. (Akhtar et al.,2022) Critically analysed the green products offered by public and private sector banks and clarified the advantages of going green to protect the environment. (S,2022) stated that banks and other financial organisations in India have a great deal of opportunity to align their operations with the values of corporate social responsibility and environmental sustainability through green banking. However, several obstacles must be overcome to take advantage of this potential, such as low customer knowledge, a lack of standardised frameworks, and budgetary limitations. (Ganesan et al.,2016) Found that customers are not well aware of green banking products and services. These are recycled credit cards, recycled debit cards, automated cash deposits, automated check deposits, a portion of loans for businesses and individuals who are environmentally conscious, green credit cards, and solar-powered ATMs. Every bank must educate its clientele about ecologically friendly goods and services by taking all appropriate measures.

A bibliometric analysis of the literature was used in this study. A literature review of green banking is done among various heads:

1. **Green Banking Practices**
2. **Green Banking Initiatives**
3. **Technology in Green Banking**
4. **Customer Perspective on Green Banking**

Green Banking Practices:

Green banking practices involve financial institutions adopting environmentally sustainable strategies, focusing on reducing their ecological footprint through energy-efficient operations, green products, and financing initiatives. These practices aim to integrate sustainability into banking operations, encouraging investment in environmentally responsible projects while enhancing transparency through detailed reporting. Banks can significantly improve their environmental performance and customer trust by fostering green projects and offering eco-friendly financial products. Effective green banking practices also enhance a bank’s image, contributing to long-term sustainability. Such initiatives positively impact green financing and environmental performance (Chen et al., 2022; Akhtar et al., 2022).

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(Prabhu,2021) Analysed the various green banking methods adopted in India and the types of green products banks offer. It also focused on examining the emerging

trends in green banking and conducted a SWOC analysis. Additionally, the study identified the Green Banking Initiatives undertaken by various Indian banks. (Kala et al., 2020) identified that energy-efficient practices, green projects, and environmental training have a noteworthy impact on the bank's environmental performance. (Bouteraa et al.,2020) Examined the idea of green banking critically from both an Islamic and a Western standpoint. The paper's design employed an analytical approach to compile information from earlier works on the Western and Islamic theories supporting the idea of GB to achieve this goal. (Hoque et al.,2019) Conducted Content analyses to investigate Bangladesh's state commercial banks and non-bank financial institutions regarding green banking practices. The study found that annual reports on green banking disclose more information than websites do. Additionally, it is discovered that in terms of green financing, state-owned specialised development banks (SDBs) and state-owned commercial banks (SCBs) have been eclipsed by private commercial banks (PCBs) and foreign commercial banks (FCBs). (Ibe-enwo et al.,2019) There is no noteworthy relation between bank trust and loyalty, but a green image significantly affects bank trust and loyalty. Green image mediates green banking practice and bank loyalty, while bank trust does not mediate the relationship between green banking practice and bank loyalty. (Rai et al.,2019) Literature shows that although there is a rising concern for green banking practices around the world, still in the context of Nepal, only a few researchers can work on it, so there seem to be research loopholes in this area. (Nath et al.,2014) found that banks are beginning to implement green practices. Before investing in various initiatives, such as Environmental Impact Assessments (EIAs), Annual Reporting Systems (ARS), Environmental Audit Management (EAM), etc., they need to build the environmental system to assess the risk associated.

Green Banking Initiatives

Green banking initiatives refer to the strategic efforts by banks to incorporate environmental sustainability into their operations and services. These initiatives often include investments in green projects, promoting energy-efficient technologies, and offering eco-friendly financial products. Such actions align with global sustainability goals and enhance banks' long-term profitability and customer trust. By integrating environmental, social, and governance (ESG) factors, banks contribute positively to the community while strengthening their green brand image. These initiatives also improve financial performance by 3aximizing returns through environmentally conscious practices (Rahman et al., 2023; Selvan et al., 2023).

(Rahman et al.,2023) a comparative analysis of green banking initiatives and practices between Bangladesh and India found that the State Bank of India (SBI) has invested more in and embraced green projects than Bangladesh Bank (BB). To Fulfil SDGs 7 and 13, the governments and banks in charge of those countries are committed to increasing investment in green banking initiatives. (Abdulla,2023) analysed ESG and green finance activities carried out by the National Bank of Bahrain (NBB), Standard Chartered Bank (SCB) Bahrain, and HSBC Bahrain demonstrated the banking industry's robust dedication to sustainability and ethical behaviour in the Kingdom of Bahrain. Every bank has implemented several initiatives about environmental, social, and governance aspects to align with global sustainability objectives and make a constructive contribution to the community. (Selvan et al.,2023) the study concluded that green banking activities improve banks' bottom lines, return on equity, and capacity for sustainable development. (Sharma et al.,2021) highlighted that more than 60% of respondents agreed that to regain customer trust through increased green brand image, green banking initiatives play a positive role. (Kaur et al.,2019) identified that SBI has taken some significant actions that are essential for starting and implementing green banking. (Arumugam et al.,2018) Identified the factors which are critical to the adoption of green banking. Banks can maximise their investment returns by including environmental, economic, and stakeholder pressure, policy guidelines, and social aspects in their green banking initiatives. (Karthikeyan et al.,2018) This comparative analysis of SBI and ICICI Bank revealed notable findings in the banks' operations concerning Cash Deposit Machines, Electronic Wallets, Internet Banking, ATM Services, RTGS, and NEFT. Also, SBI has a larger operational footprint than ICICI Bank.

Technology in Green Banking

Technology in green banking refers to integrating digital tools and services that enhance the efficiency and sustainability of banking operations. It enables banks to offer online services, reduce paper usage, optimise operational costs, and support eco-friendly initiatives. Advanced fintech infrastructures improve credit risk assessment and resource allocation, increasing green credit volumes. Furthermore, technology helps automate routine tasks, enabling smoother processes within the banking sector while enhancing customer satisfaction with service quality. Technology is vital in driving green banking initiatives and improving service efficiency (Sharma et al., 2024; He et al., 2024).

(Khan et al.,2024) concluded that customers' satisfaction with banking services was positively and statistically significantly correlated with three technology service quality parameters. The two remaining measures, empathy and responsiveness, showed a negative but significant correlation. All characteristics, except "Reliability," "Responsiveness," and "Empathy," were found to have a statistically significant positive connection with technology service quality and technology satisfaction during the pandemic.

(He et al.,2024) The results show a positive U-shaped association. The higher green credit risk associated with fintech's early stages adversely affects green credit volume.

On the other hand, highly developed fintech infrastructures improve credit risk assessment and resource allocation to increase green credit volumes dramatically.

(Al-Ghalabi et al.,2024) Emphasised that digital HR

technology automates workers' everyday routines by transferring HR responsibilities to the appropriate department, removes administrative tasks, and allows change through its adaptability.

(Serdaruši et al.,2024) This research added new values to the relationship between green finance initiatives and digital banking trends, underscoring the requirement for enhanced digital awareness and adopting green finance concepts in the banking sector.

(Sharma et al.,2022) concluded that technology has a different role for green banking in India's private sector banks. It helps banks offer online and digital services, optimises costs, helps banks go paperless, and boosts the effectiveness and efficiency of the banking industry overall. It also supports the banks' green banking initiatives. Additionally, it has been discovered that technology is a critical component of green banking in private-sector banks.

Customer Perspective on Green Banking

Customer perspective on green banking refers to how customers perceive, adapt, and engage with environmentally sustainable banking practices. It highlights the importance of understanding customer intentions, which are crucial in driving behaviours such as adopting green banking services (Ahmad et al., 2023). Trust, security, and usability significantly shape customers' satisfaction and willingness to engage with green banking initiatives (H.M.A.K. et al., 2019). However, despite the rising demand for eco-friendly products, many customers are still unaware of green banking offerings, 4mphasizing the need for banks to enhance awareness and education efforts (Ganesan et al., 2016).

(Ahmad et al.,2023) studied the fact that customer behavioural intentions are essential as intentions lead to behaviours. Most factors are relevant; this study showed the criteria that encourage people to choose green banking. Except for environmental ideals, every factor drove the adoption of green banking. (Bouteraa et al.,2020) In order to capture customers' intention to accept GB efforts, the study's outcome suggested an original model that integrated eight new crucial factors into the Unified Theory of Acceptance and Use of Technology (UTAUT). The study may give bankers more insight into how to create appropriate interventions for implementing GB projects that would promote more sustainability. (Han et al.,2019) The result showed a correlation between the bank's competitiveness and profitability and how the green credit policy is implemented. However, from the standpoint of long-term practice development, green credit policies are less impacting bank profitability improvements; in other words, they are diminishing the marginal efficiency of bank profitability. (H.M.A.K. et al.,2019) In the domains of technology adoption, service quality, and e-service quality, most recognised research models supported the security and trust, usability, and value-creating qualities. The current study has demonstrated the necessity and significance of including these qualities while presenting an ideal set of variables characterising green initiatives' characteristics. These factors should have an impact on overall customer satisfaction with green banking. (Raj et al.,2017) identified that the actions made by Indian banks are commendable, but they are not keeping up with global standards. The government, non-governmental organisations, corporate organisations, and customers should all support the bank's efforts to develop and expand its green banking offerings. The green banking offering that the banks currently offer should not satisfy them. They must always be at the forefront of launching cutting-edge products, both for the good of society and for themselves. (Shampa et al.,2017) They found that to promote sustainable development and environmental protection, the study aimed to raise consumers' expectations with the bank's green initiatives. Consumer demand for environmentally friendly products and services is rising. Therefore, the bank must assist them by giving them adequate information about the products. Additionally, adjustments should be made to regular operations to make environment-related issues more visible to customers. In general, banks ought to implement tactics to position themselves as "Green Banks" in the eyes of their clients. (Ganesan et al.,2016) Found that customers are not well aware of green banking products and services. These are recycled credit cards, recycled debit cards, automated cash deposits, automated check deposits, a portion of loans for businesses and individuals who are environmentally conscious, green credit cards, and solar-powered ATMs. Every bank must educate its clientele about environmentally friendly goods and services by taking all appropriate measures.

Through the literature, it is found that green banking is an evolving term, and according to the best knowledge of researchers, more papers need to be conducted to identify the factors of adoption in green banking. So, this paper is based on a bibliometric analysis of the literature on green banking. Authors had taken Scopus; the more extensive citation database frequently utilised in bibliometric research. (Donthu et al., 2021).

RESEARCH METHODOLOGY:

Bibliometric analytic approaches are applied to evaluate the literature currently in the green banking field. The popular method known as bibliometric analysis can thoroughly examine and analyse large volumes of scientific data. Scholars can conduct ambitious retrospectives of business research and overcome their apprehension of working with substantial bibliometric datasets with the help of the bibliometric technique (Donthu et al.,2021).

The study's research objectives are:

1. To identify the trend of publications in the banking sector in the context of Green Initiatives.
2. To identify the most influential countries, journals, articles, and authors contributing to the green banking literature.
3. To identify the influential research themes in this domain.
4. To examine the factors affecting the adoption of green initiatives in banking.

The procedure begins with a Scopus database search for the term "green bank*" in article titles. Green banking is an evolving term, and according to the best knowledge of researchers, there is a shortage of literature on the trends of publications and factors affecting the adoption of green initiatives. The Authors limit the search to Subject areas (Economics, Econometrics and Finance), (Business, Management and Accounting), Document type articles, source-type journals, and language, English (Appendix A). A total of 1425 Documents were found from the search term. After applying the relevant filters, it was reduced to 115 documents.

TITLE-ABS-KEY ("Green Bank*") AND (LIMIT-TO (SUBJAREA, "ECON") OR LIMIT-TO (SUBJAREA, "BUSI")) AND (LIMIT-TO (DOCTYPE, "ar")) AND (LIMIT-TO (SRCTYPE, "j")) AND (LIMIT-TO (LANGUAGE, "English"))

As per the dataset's completeness report, the following fields score "excellent": Abstract (AB), Affiliation (C1), Author (AU), Cited Reference (CR), Document Type (DT), Journal (SO), Language (LA), Publication Year (PY), Title (TI), and Total Citations (TC); Keywords score "good," DOI (DI) and Corresponding Author (RP) and Science Categories (WC) score "poor" and "completely missing." That leaves 107 research publications in our final sample.

To assist authors in reporting the purpose of the review, the actions are taken, and the conclusions reached methodically and uniformly; the Prisma statement provides a checklist and a flow diagram. Prisma, which stands for "Preferred Reporting Items for Systematic Reviews and Meta-Analyses," is a commonly recognised set of recommendations designed to enhance the reporting of these kinds of research studies to guarantee completeness, clarity, and transparency (Moher et al., 2009).

Prisma is an essential tool for bibliometric analysis, which examines scholarly publications and citations. It assists in organising and managing big data sets for research papers. Prisma facilitates the retrieval and manipulation of data, hence streamlining analytical tasks such as monitoring citation counts, examining collaboration networks, and recognising research patterns (Prisma, n.d.).

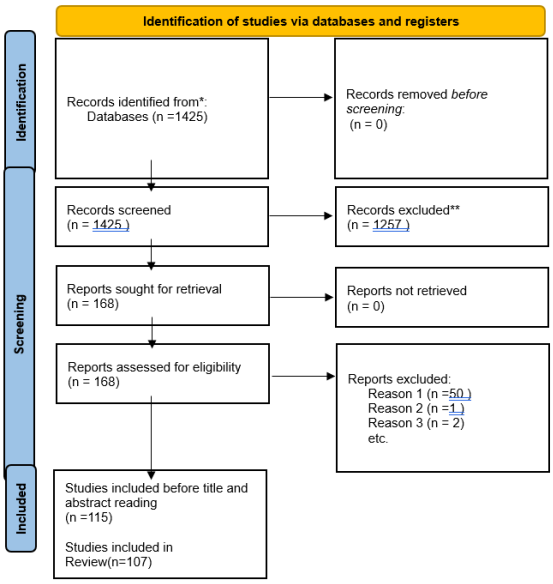

Figure 1: Prisma Chart

From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ 2021;372:n71. Doi: 10.1136/bmj.n71

Stage 1 IDENTIFICATION

The identification phase entails an extensive search through several databases and additional sources to collect all relevant studies, ensuring no significant studies are overlooked (Moher et al., 2009). During the identification stage, researchers gather a list of possibly pertinent studies from various sources, including databases, journals, and other repositories. The main objective is to compile all currently available papers that may be pertinent to the research subject. Usually, this stage consists of:

1. **Database searches:** To locate publications, use electronic databases such as Scopus, PubMed, Web of Science, etc.
2. **Manual searches**: manually check references in essential journals and pertinent studies.
3. **Finding grey literature** refers to looking for works not published in standard publications, such as theses, conference papers, and reports.

Each source is meticulously recorded, and duplicate entries are identified and removed to ensure the dataset is accurate and comprehensive (Moher et al., 2009).

At the Identification stage, the search query ("Green Bank*") within the Article title, Abstract, and keywords are typed into the Scopus Database. A total number of 1425 documents is found.

Stage 2 Screening: In Screening Phase 1.) Record Screened 1425 documents, Records Excluded 1257 due to applying the filtering option of Subject Area (Economics, Econometrics and Finance), (Business, Management and Accounting).

1. The records sought for retrieval are 168, as 1257 documents are excluded.
2. Reports assessed for eligibility is 168 and exclude

some documents due to the following reasons:

Reason 1: Doc type- only Article was taken, so 50 documents were excluded.

Reason 2: Source type – Only Journal is selected; 1 document is excluded.

Reason 3: Language – Only English articles are selected, so two more documents are excluded due to another language.

Stage 3: INCLUDED

Before the title and abstract reading, a total of 115 documents were there. After reading, I found that only 107 articles were included in this paper.

RESULTS

We highlight the characteristics of Biblioshiny, a web interface package that may be customised for bibliometric analysis using bibliometrix, a programming language for R (Aria & Cuccurullo, 2017). With biblioshiny, we generate a thematic map, TreeMap, thematic evolution map, co-citation plot, and collaboration plots. Furthermore, we provide overlay visualisations of keyword analysis and bibliometric coupling using VOSviewer, as van Eck and Waltman (2009) recommended.

Trends of Publication: The pattern or direction of changes in the quantity of scientific publications over time is referred to as the "trend of publication" in bibliometric analysis. **Figure 1** shows an increasing trend in Annual Scientific Production. From 1992 to 2011, there is no scope for green banking. The term green bank started gaining popularity in 2020, but the publications never declined.

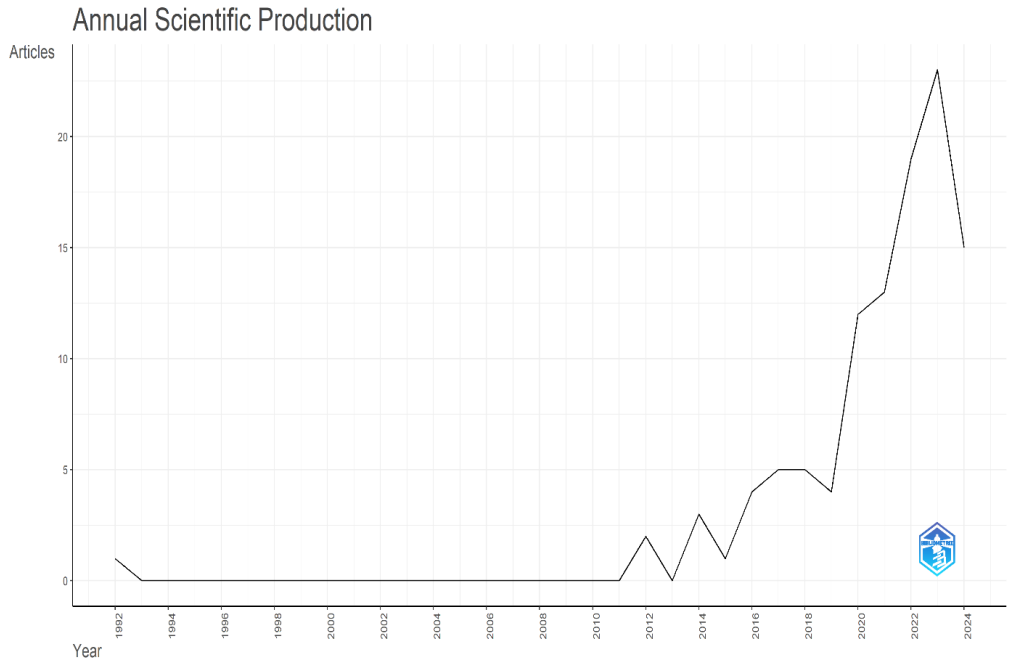

Figure 1 (Annual Scientific Production)

Country Scientific Production: In bibliometric analysis, country scientific production refers to analysing and contrasting various nations' research output. This kind of investigation reveals the global distribution of scientific activity and the relative contributions of different countries to the corpus of scientific knowledge. **Figure 2** shows that the highest frequency of scientific production is in India and Malaysia that is 46, followed by Pakistan (25), then Bangladesh (24), Indonesia (17), China(13), Australia(10), France(9), Kazakhstan(8) and Oman(8). These are the top ten countries in publications related to green banking. The number of publications is still low because it is a very recent and emerging topic.

Figure 2 (Country et al.)

Most Relevant Sources: In this bibliometric study, the most relevant sources are Environment, Development and Sustainability (7) and International Journal of Green Economics (7), followed by the International Journal of Ethics and Systems (5), Journal of Islamic Marketing (4), Banks and Bank Systems (3).

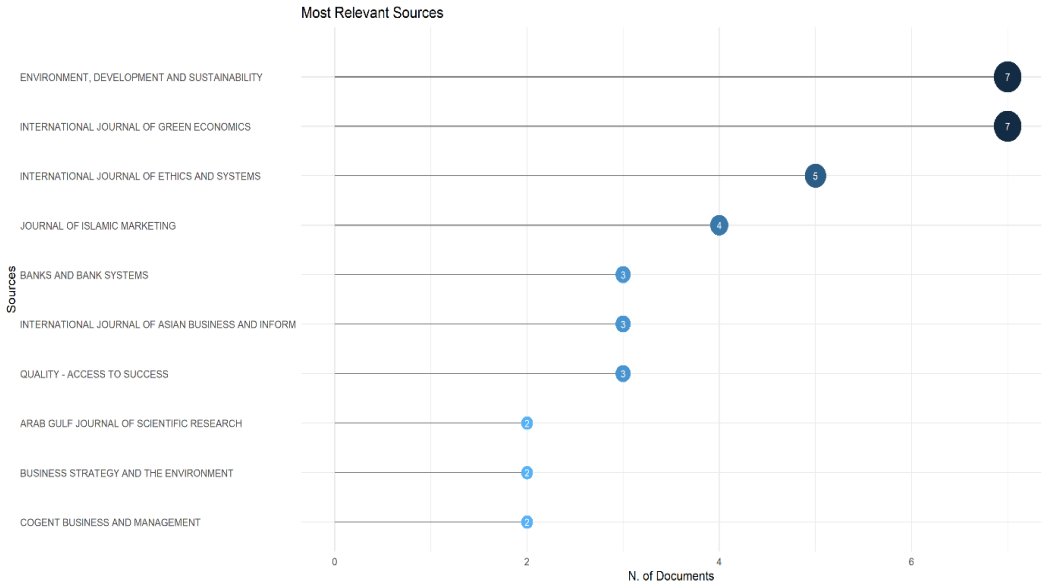

Figure 3: Most Relevant Sources.

Co-citation Network: An author co-citation network, a bibliometric technique, analyses the links between authors based on the frequency of their mentions in other research works. The structure of scientific areas, research clusters, and notable writers can all be found using this kind of analysis.

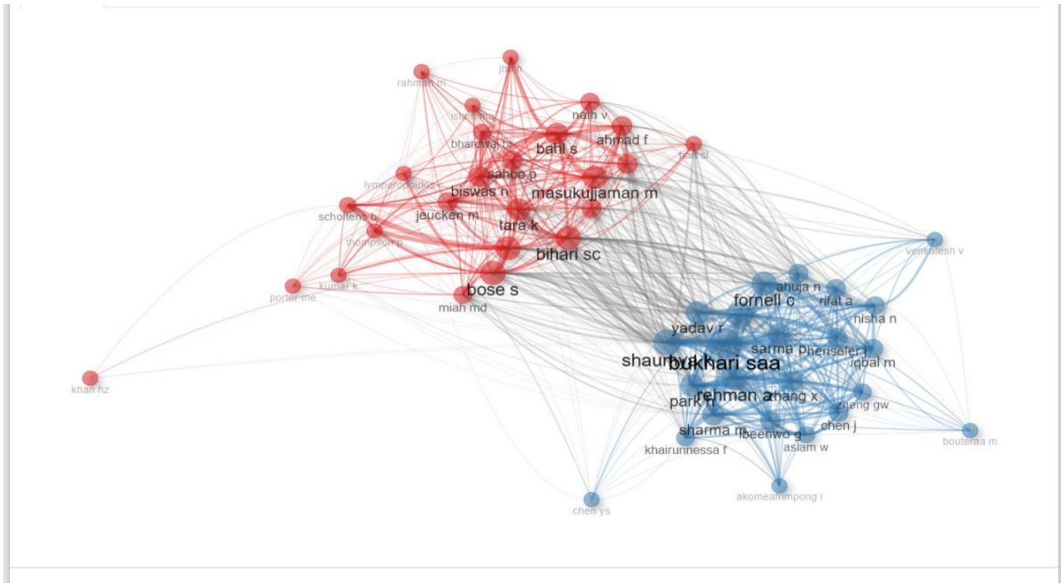

Figure 4 (Co-citation Network)

Most Cited Global Documents: "most globally cited document" describes a research paper, article, or other publication cited by other scholars, most often across the globe. In bibliometrics and bibliographic analysis, citations are a crucial metric that shows how influential and impactful a text is in the scientific community. In this paper, these are the top 5 global cited documents.

SADIQ M, 2022, CHINA FINANCE REV INT (126),
BOSE S, 2018, ASIA PAC J MANAGE (119),
RUBEL MRB, 2020, EMPLOYEE RELAT (104),
SHARMA M, 2022, ENVIRON DEV SUSTAINABILITY (71),
REHMAN A, 2021, ENVIRON DEV SUSTAINABILITY (64),

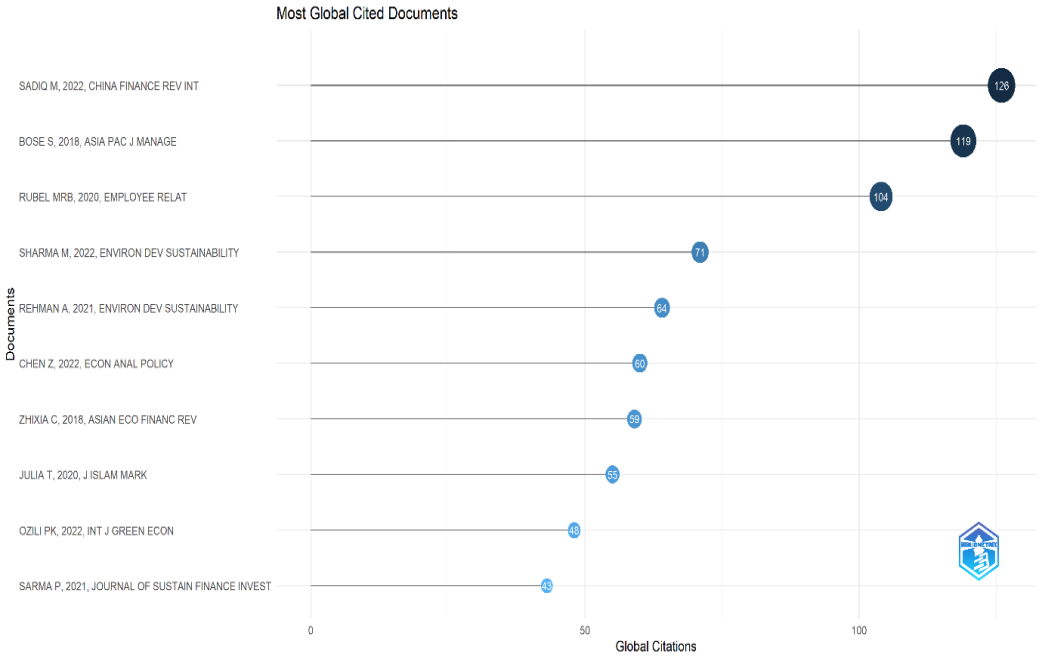

Figure 5 (Most Global Cited Documents)

Thematic Map: In bibliometric analysis, a theme map is a technique for visualising a research field's topic structure and evolution. It facilitates locating and comprehending the primary ideas, patterns, and connections within a corpus of scientific literature. The thematic map is made of four theme quadrants. In Niche Themes, current status, prospects, green banking practices of banks, etc. were highlighted. Motor themes are climate change, green marketing, green banking, and financial performances, which are four clusters derived. Emerging Themes are green banking adoption and banking performance. Basic themes included commercial banks, green banks and emerging economies.

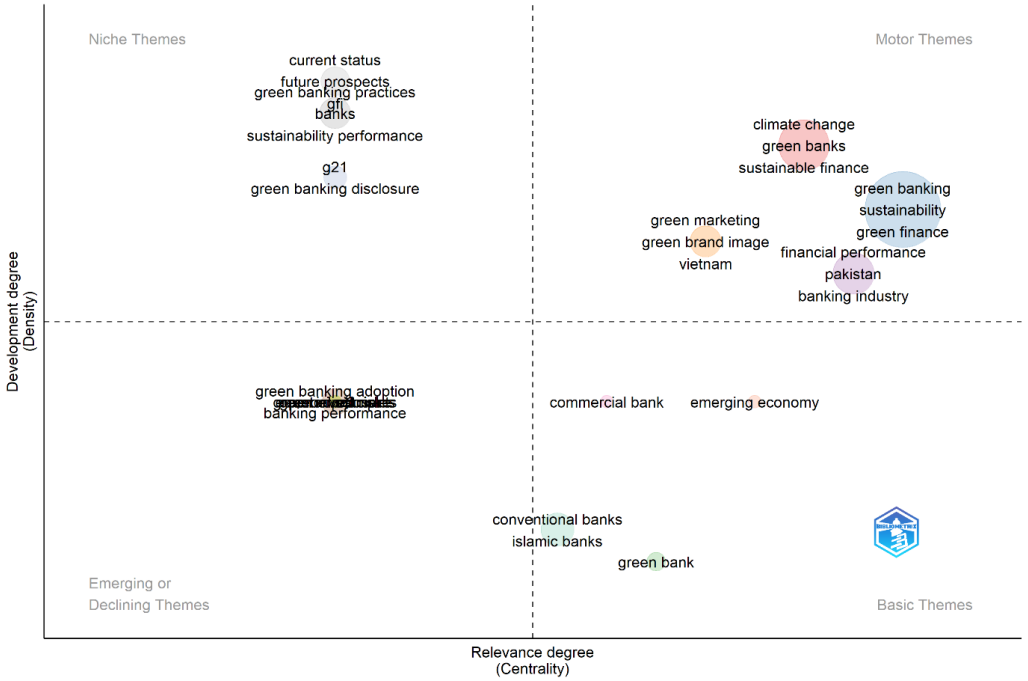

Figure 6: Thematic Map

Tree Map: A treemap, sometimes known as a treemap, is a type of data visualisation where nested rectangles are used to show hierarchical data. It makes it simple to compare several categories or subcategories by indicating the size of each element in the hierarchy. When presenting data with several levels of categorisation, tree maps are beneficial because the size of each rectangle in the map corresponds to a numerical value. In this paper, green banking (22%) is the most frequently used term, followed by sustainability (5%), then green finance (3%), Environmental performance (3%), green financing (3%) and so on.

Figure 7: Tree Map

Co-Word Analysis: One bibliometric method for examining the connections between words or phrases in a set of documents is co-word analysis. It assists in determining the primary themes, patterns, and organisation of a subject of study by examining word frequency and co-occurrence.

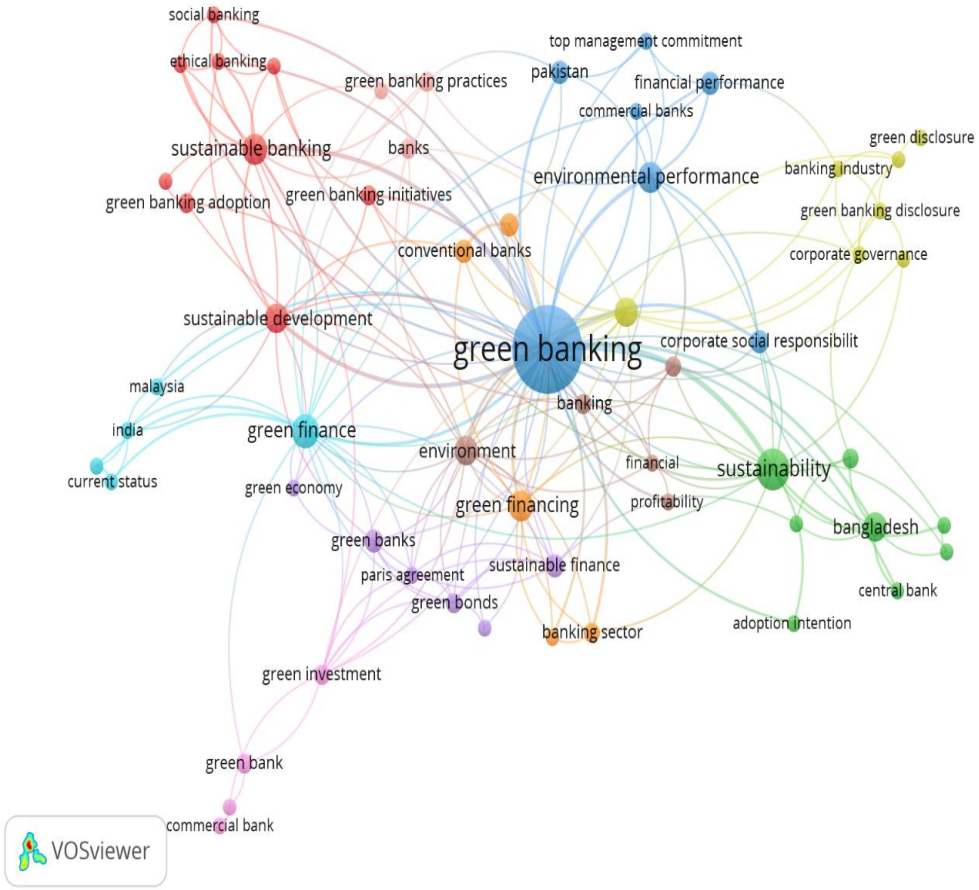

Figure 8: Co-Word Analysis

Objective 4 is to examine the factors affecting the adoption of green initiatives in banking. Analysing various internal and external factors that either facilitate or impede the adoption of environmentally sustainable practices within the banking industry is necessary when examining the factors influencing the adoption of green initiatives.

The authors made a table of the best 15 research papers to examine the factors affecting the adoption of green initiatives in banking.

Table 1 Factors Adoption of Green Banking

Author(s) and year	Factors	Model/Theory	Methods and no of respondent
Okyere-kwakye et al. (2021)	Customer Pressure, Management Support, Competitors Pressure, Intention, Employees Perception	Multiple Regression	Factor analysis PCA, 94, GHANA
Burhanudin et al. (2020)	Guilt, Perceived Consumer effectiveness, Negative word of mouth, Attitude, Intention, Perceived Ability, Reduce Environment Degradation.	SEM, CFA	Variance Inflation Factor (VIF), 313, Indonesia
Tara et al., (2018)	Location of Banks, Work Experience, Designation, age, gender, objective setting, decision making, environmental sensitivity, Regulatory control for societal benefit, Pressure from external agencies	Factor Analysis	PCA, 242, INDIA
Kumar et al., (2019)	Environment-friendly projects, windmills, solar power projects, Product development and services, Communication, generic published information, generic financing, unique products, social issues and charity,	Theoretical Model	Content Analysis, Interviews, 9, India
Degryse et al., (2023)	Paris Agreement, Climate Change, Environment Consciousness, Syndicated Loans, Pricing Loans to Green Firms.	Base Line Regression, OLS Regression, Ordered Logit Regression	Sensitivity Analysis, Two Stage Least Squares, Paris Falsification Test, 359
Zhang et al., (2023)	Enhancing green loans, Bank Financing, Green Bank guarantees, Energy Transition, Green financing, Market Value, Renewable energy consumption, Greenhouse gas emission, CoP26 goals.	STIRPAT	LLC, ADF, CIPS panel unit root test, Kao's panel Co-integration test (FMOLS), 40 Countries.
Khan et al., (2021)	Firm value, green banking disclosures, Firm size, Leverage, Profitability, Turnover, Firm age, Foreign Ownership, Volatility, Firm Growth, Political Connections, Institutional ownership, Govt. Ownership, Non-Performing Loans, Stakeholder Pressure.	Regression Model, OLS (Lead lag Approach)	Content Analysis, Cronbach's Alpha, 172 bank firms, Bangladesh
Iqbal et al.,(2021)	Perceived Risk (Performance, Individual, Financial, Time, Cyber)	CB-SEM	PLS-SEM, KMO-Test, 540, Bangladesh

	Factor of Attractiveness (Task, Social, Physical)		
Donath et al.,(2023)	Existence of Information, Channelling, Mutual interaction of banks, Bank's attitude as green, Undecided and outsiders (GUO)	Mathematical Model	Numerical Simulation, Romania
Mehedi et al.,(2017)	Minimise Environmental Pollution, Green Lending Policy, Green Investment, Economic Value Added, Market Value Added, Environment Friendly, Sacrificing Cost, Maximize Shareholders Wealth, Sustainable Development, Natural Disasters, Climate Risks Fund	ANOVA, Multiple Regression Analysis,	Paired Sample T-test, Bangladesh
Khan et. al.,(2023)	Bank Reputation, Environmental Awareness, Green Banking Practices.	SEM (Structure Equation Modelling)	Smart-PLS, 390, Pakistan
Rehman et.al.,(2020)	Environmental Performance, Adoption of Green Banking Practices, Bank Investment Decisions, Bank Policies	SEM (Structure Equation Modelling)	Factor Analysis, Measurement Model,200, Pakistan
Nisha (2020)	Management Support, Customer and Competitor Pressure	TAM (Technology Acceptance Model)	Smart-PLS, 205, Bangladesh
Mehta et.al.,(2024)	CSR, Customer Engagement, Green Consumer Loyalty, Environment Value, Customer's Eco-Consciousness, green banking digitalisation	SEM (Structure Equation Modelling)	Multicollinearity, VIF, 300, Pakistan
Bose et.al.,(2020)	Green Banking Performance, Financial Performance,	Lead Lag Approach in Regression Models	OLS Technique, Sensitivity Tests (DiD, PSM, Heckman's two-stage analysis), 172,

	Corporate Political Connections, CSR Performance, Cost Efficiency, Regulatory Setting		Bangladesh

CONCLUSION AND IMPLICATIONS

More environmentally sustainable initiatives must be financed in light of climate change and its negative environmental repercussions. Subsequently, the term "green bank*" appeared in financial and economic literature. This study maps the intellectual landscape of the scholarly growth of green banking research using bibliometric analysis, utilising 107 research publications. Even though the term "green bank" first surfaced in academic writing, from 2020 onward, the amount of research produced has increased exponentially. India and Malaysia are the leaders in green bank research among the nations, both in independently published and internationally coauthored works.

Furthermore, our research can assist policymakers in developing more evidence-based and successful strategies to facilitate the transition. Our research has several policy ramifications. To formulate effective policy measures that promote green finance, stimulate investment in green initiatives, and facilitate the transition to a low-carbon economy, scholars and policymakers must first comprehend the landscape of green banking research and the most significant and dynamic research domains. Second, policymakers can prioritise policies and efforts about green banking by using our findings to influence their decisions. Third, our research on cooperation networks contributes to developing collaboration amongst academic institutions, governmental organisations, and industry stakeholders. This can help close the knowledge gap between research and policy and provide more successful policy results. Lastly, the authors identified the factors that may help consumers adopt green banking initiatives. Governments, institutions, and organisations were helped in formulating policies.

Even though a large body of research on green finance studies utilising only the Scopus data set is covered in this paper, some significant studies from other sources may be missed. Last but not least, bibliometric research is predicated on authors' keywords. Many authors include irrelevant and improper terms in their publications, which will probably affect our findings—particularly when creating clusters and spotting emerging themes.

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