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Exploring the Sustainability-Microfinance Interface: A Bibliometric Review and Future Research Directions

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Abstract
The quest for sustainable development underscores the critical need to mobilize the resources and investments in such a manner that promotes environmental preservation and planet-friendly practices. This study aims to systematically consolidate and synthesize the existing corpus of literature on the nexus of microfinance and sustainability through a bibliometric review of 483 documents spanning 2014-2024, which has been curated from the Scopus database. This study presents a pioneering effort to examine the role of microfinance in promoting sustainability to uncover the intellectual structure, research trends, and practical implications within this domain. Trend analysis illustrated an upward trend in research attention and indicated significant growth in 2023, underscoring the rising relevance of microfinance in promoting sustainability. By utilizing the tools like VOS viewer software and biblioshiny application of R software, the study identified four main thematic clusters through the keyword's co-occurrence analysis: "Role of microfinance in driving sustainability, Trade-off between financial and social performance, Financial inclusion and sustainable microfinance practices, and Achieving financial and social efficiency through corporate governance practices."

Keywords: Microfinance, Sustainability, Bibliometric analysis, Scopus, VOS viewer, Biblioshiny

1. Introduction

The microfinance sector exhibits substantial growth potential and is putting itself in a position to become the world's biggest financial market in terms of customer base (Mersland et al., 2013). The word 'microfinance' indicates providing financial services to the economically disadvantaged individuals, and often includes microcredit, micro-banking, micro-savings, micro-insurance, and money transfer services (van Rooyen et al., 2013). Over the years, microfinance has not only helped in economic development but has also been recognized for its potential to promote sustainability. As a powerful tool for financial inclusion, Microfinance Institutions (MFIs) have gained relevance in addressing the dual objectives of poverty alleviation and sustainable economic growth (Ayodele & Arogundade, 2014). Sustainability is a multifaceted concept that closely weaves together economic success, societal well-being, and environmental preservation (Maria, 2015; Carrillo & Jorge, 2017). According to Boons & Lüdeke-Freund (2013), sustainability fosters a peaceful civililization within the frontier of our planet by internalizing and minimizing adverse environmental and social effects. The microfinance sector is experiencing significant public interest due to its crucial role in expanding and improving the traditional financial system, which has a noticeable impact on sustainable development (Beisland et al., 2015; Busch et al., 2016). Microfinance initiatives possess the capacity to foster equitable and sustainable development (García-Pérez et al., 2018; Vishwakarma et al., 2024).

MFIs have a significant impact on sustainability's social, economic, and financial dimensions as well as, more recently, its environmental dimension (Ashraf et al., 2022; Blanco-Oliver et al., 2023). Microfinance services are becoming more important as a catalyst for revolutionary change due to the rising prominence of sustainability in the global discourse driven by the demands of social fairness and environmental conservation (Agyeman et al., 2002; Warnecke, 2015). Therefore, in order to completely comprehend the dynamics of microfinance and sustainability research and its potential for future research, one must have an in-depth understanding of this field. In recent years, scholars and practitioners have focused more on the relationship between microfinance, environmental sustainability, social inclusion, and financial stability (Ashraf et al., 2022; Niaz, 2022; Kumar & Asmare, 2024). As these services continue to change in response to customers' shifting wants and rapidly advancing technology, it is crucial to comprehend the current state of research and the key themes in this field. Bibliometric analysis is used to systematically assess academic literature and obtain deeper insights into the corpus of current knowledge. The ultimate purpose of this bibliometric analysis is to identify research gaps, provide recommendations for the future, and contribute significant insights to the body of current knowledge by evaluating and synthesizing the available research.

Within this research purview, the intersection of sustainability theory and the microfinance model becomes a central topic that requires elucidation through meticulous analysis and thorough synthesis of previous research. This bibliometric analysis used a combination of performance analysis and science mapping to provide a broad overview,

clarifying emerging themes, identifying research directions, and pointing the way toward novel insights and epistemological frontiers in the dynamic interplay between sustainability imperatives and the microfinance sector.
The present document is divided into seven sections that outline different aspects. By outlining the study's objective, the Introduction section initially established the context. The second section caters with a comprehensive summary of the existing literature on microfinance and sustainability, followed by the methodological approach, described in the third section. Section 4 provides the results and discussion derived from the bibliometric analysis of the designated literature. Following this, Section 5 encapsulates the conclusion. Ultimately, section 6 provides managerial implications, limitations, and future research recommendations.

2. Literature Review

This section offers a comprehensive review of the existing literature on the nexus of microfinance and sustainability, examining the evolving discourse surrounding the role of MFIs in promoting socio-economic development while ensuring environmental, social, and financial sustainability.

Table 1: Existing Review Studies

Document	Title	Outcomes
Mwirigi et al. (2024)	"A Bibliometric Analysis of Borrowers' Behavior"	It aims to understand the decision-making process of borrowers and how it affects the functioning of loan facilities. It further recommends conducting additional research on demand-side dynamics.
Gatto (2023)	"Can renewable energy microfinance promote financial inclusion and empower the vulnerable?"	It demonstrated the potential of energy microfinance in promoting sustainable development by empowering marginalized people with access to renewable energy, encouraging entrepreneurship, and addressing social and environmental issues.
Liu et al. (2023)	"Research into microfinance and ICTs: A bibliometric analysis"	Systematically reviewed the literature on Information and communication technologies in microfinance, covering peer-to-peer lending, mobile banking and crowdfunding as the most popular research topics, and also highlighted the potential of fintech, particularly blockchain, for advancing financial inclusion in future research.
Gupta and Sharma (2023)	"Literature review on effect of microfinance institutions on poverty in South Asian countries and their sustainability"	This SLR concluded that microfinance institutions positively impact poverty in South Asian nations. It also highlighted variations across different categories of the poor and the ongoing debate regarding the trade-off between sustainability and outreach.
Sinha and Ghosh (2022)	"Organizational sustainability and performance improvement in microfinance institutions (MFIs): managerial insights of what, why and how"	SLR and the balanced scorecard (BSC) approach were used to develop a comprehensive framework to assess the performance of microfinance institutions. It also stated that majority of research on MFIs' sustainability focused on financial outcomes rather than non-financial.
Hussein Kakembo et al. (2021)	"Adopting Islamic microfinance as a mechanism of financing small and medium enterprises in Uganda"	This study drew attention to the inability of current MFIs to sustainably serve the SMEs in Uganda. It found that the incorporation of Islamic finance into the regulatory framework could address financial challenges faced by SMEs, advocating for its adoption to enhance sustainability and promote economic empowerment.
Hassan et al. (2021)	"Islamic microfinance: A bibliometric review"	This study indicated that Malaysia is a major hub for research on Islamic microfinance, with a special emphasis on women's empowerment, sustainable development, principles, performance, and the role of banks.
Gálvez-Sánchez et al. (2021)	"Research advances on financial inclusion: A bibliometric analysis"	Examined the advancement made in financial inclusion research and underscored the growing interest of researchers in leveraging Fintech for accessibility and aligning with the 2030 Agenda for Sustainable Development goals.

Bhatt et al. (2020)	"A study of ICT adoption and its impact on selected MFIs of Gujarat"	It contended how ICT transforms the Indian microfinance sector, with a particular focus on how technology might improve MFI's operations.
Irfan (2020)	"A Meta-Analysis of Islamic microfinance: Case-based evidence from India"	This study categorized the literature on Islamic microfinance into seven areas including social benefits, religious values, business ventures, poverty alleviation, sustainable development, rural development, and economic development.
Zaby (2019)	"Science mapping of the global knowledge base on microfinance: Influential authors and documents, 1989-2019"	Employed science mapping technique to investigate microfinance's role in sustainable development and the results revealed different thematic areas headed towards institutional aspects of microfinance, impact evaluation through different sophisticated and microfinance-social justice in general
Reichert (2018)	"A meta-analysis examining the nature of trade-offs in microfinance"	Underlined different dimensions and features associated with trade-offs between the financial/monetary and social objectives of microfinance institutions and explained/underscored/mentioned the difficulties/challenges that arise in balancing these objectives for sustainable performance.
García-Pérez et al. (2017)	"Microfinance literature: A sustainability level perspective survey"	Examined the contributions of microfinance research to sustainability, pointing out knowledge gaps, and suggesting future research directions aligning with the Global Reporting Initiative framework and EESG standards.
Bayai and Ikhide (2016)	"Financing and financial sustainability of microfinance institutions (MFIs): A conceptual view"	It stated that in order to improve the financial sustainability of microfinance institutions while addressing mission drift and other challenges there should be a balance between various funding methods, such as smart subsidies, debt, deposits, and equity.

The current study fills a significant gap in the literature by being the first study to conduct a comprehensive literature review on the nexus of microfinance and sustainability. To the best of the authors' knowledge, no comprehensive bibliometric analysis has yet thoroughly examined prior research concerning the nexus of microfinance and sustainability. It is evident from Table 1, despite the existence of 14 review studies related to this domain, none have delved into this area. The breadth and intricacy of the subject matter could be the cause of this disparity.

Research questions

This study aims to address the following research questions identified from the literature:

1) How has the trend of publication/ scholarly literature on the intersection of microfinance and sustainability evolved over the past 10 years, both temporally and across different regions?
2) What are the key contributors in terms of authors, journals, documents, affiliations, and countries that have exerted a significant impact on literature concerning microfinance and sustainability?
3) What kind of social network structure exists amongst authors and countries that work together to investigate the scholarly relationship between microfinance and sustainability?
4) What are the prominent research themes and emerging patterns within the area of microfinance and sustainability as reflected in the academic literature?

3. Materials and Methods

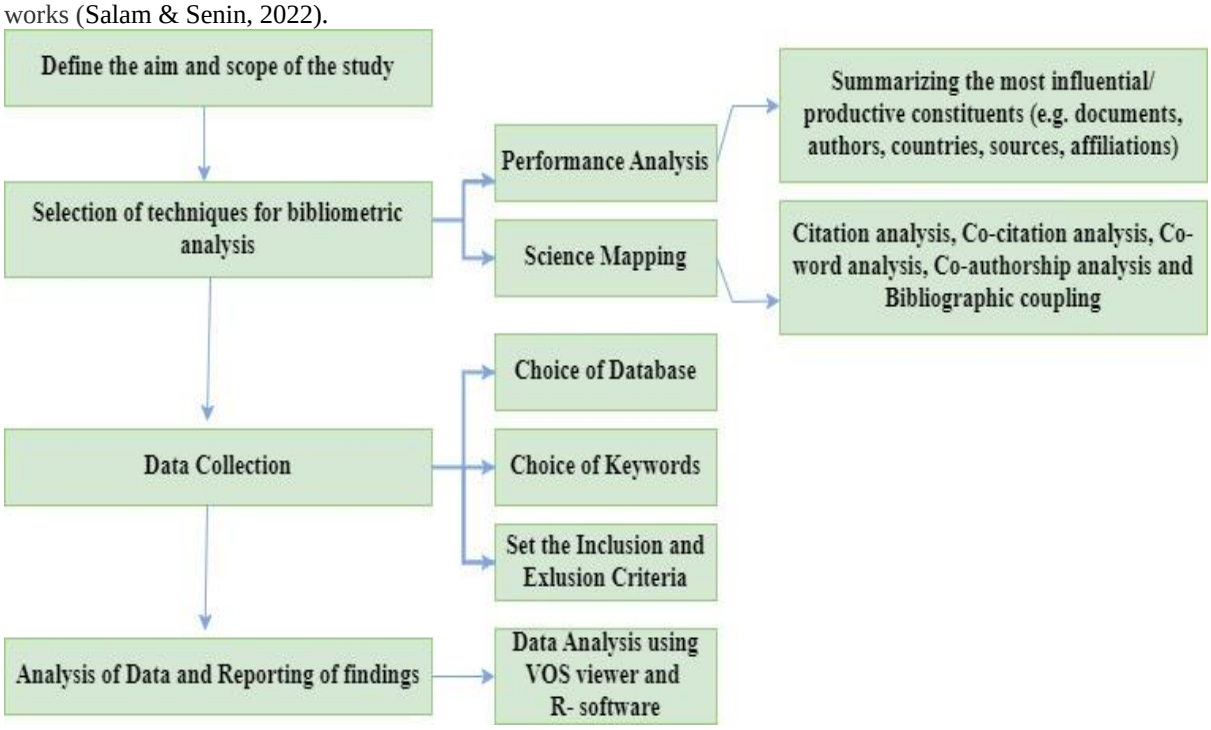
The present study adopts bibliometric analysis as a scientific method to understand the development of the microfinance concept in scientific publications and how it contributes to sustainability. This analysis involves examining publication productivity and identifying the most influential documents, sources, countries, organizations, topics, and thematic areas. Bibliometric analysis is a specialized research field that utilizes various quantitative methods grouped into performance analysis and scientific mapping to analyze the bibliographic data (Pritchard, 1969; Broadus, 1987). Relying on the methodology proposed by Donthu et al. (2021a), this study involves a four-step systematic approach, as depicted in Figure 1. The initial step starts with delineating the study's objectives and scope, followed by a selection of an appropriate analysis method, the collection of data, and data analysis while presenting the results(Kumar et al., 2024).

The bibliometric approach combines performance analysis and scientific mapping techniques to gain a deeper understanding of research trends (Jin et al., 2019a; 2019b). Performance analysis encompasses a variety of

methodologies, including word frequency analysis, citation analysis, and quantifying the research outputs based on specific units of analysis like number of publication and citations, to examine the volume and impact of research (Samiee & Chabowski, 2012; Donthu et al., 2021a), while scientific mapping relies on relational indicators to create visual representations that show the connections between different research elements (Cobo et al., 2018).

3.1 Choice of Database

As demonstrated by Figure 1, the data collection phase starts with the selection of a database to extract relevant documents for analysis. In the present study, the Scopus database is utilised for data extraction, which is a widely used database that contains extensive research in social science and has an intuitive user interface (Pérez-Gutiérrez & Cobo-Corrales, 2022). Scopus, an Elsevier-operated database (Aghaei Chadegani et al., 2013), compiles prestigious journals with the most recent articles and serves as the main repository for abstracts and references for academically reviewed works (Salam & Senin, 2022).



(Figure 1: Methodology for Bibliometric Analysis based on Donthu et al., 2021a)

3.2 Choice of Keywords

Based on the existing studies on microfinance with context to sustainability, keywords are identified for the initial search (Srisusilawati et al., 2021; Hassan et al., 2021).

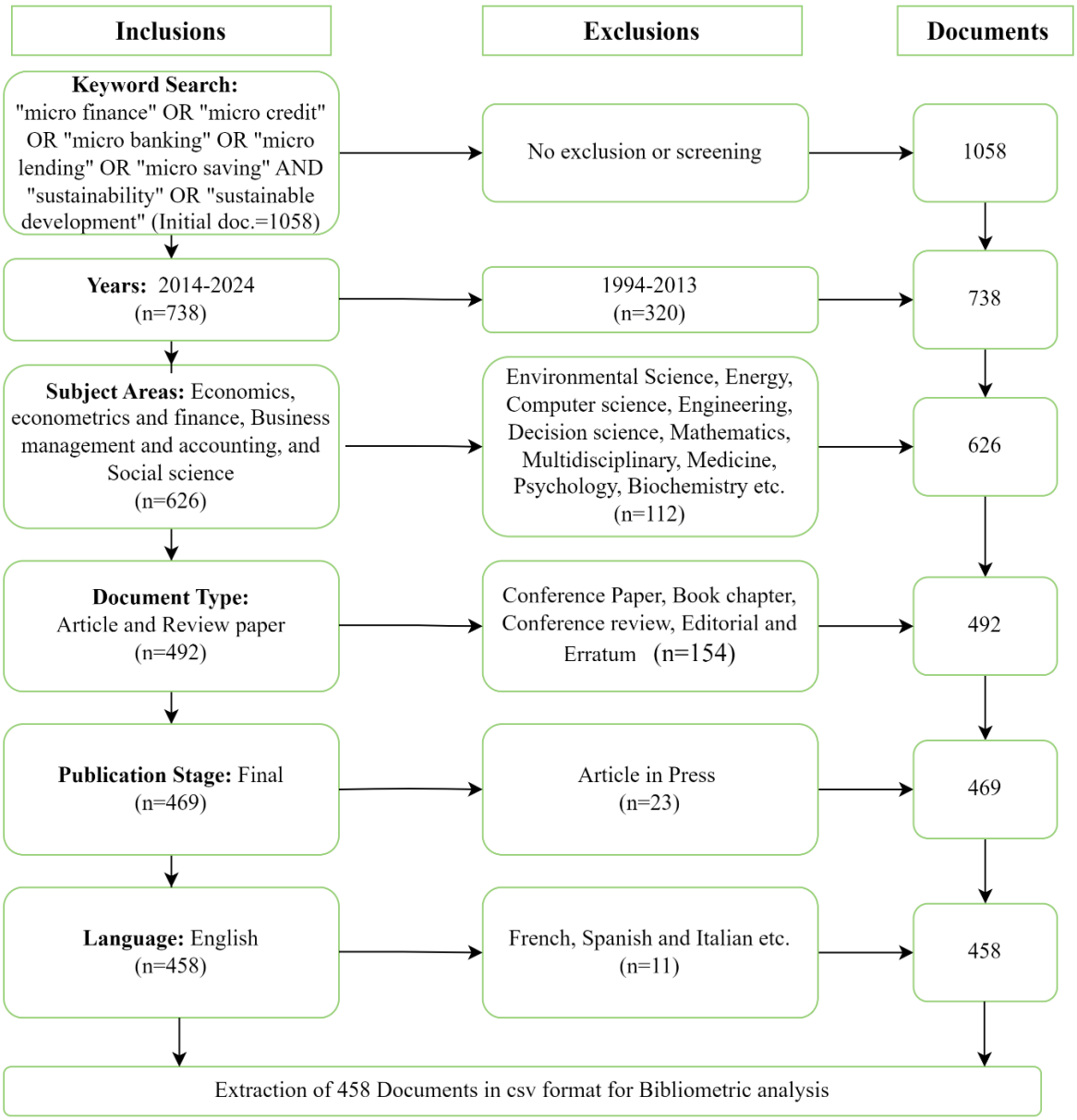
Table 2: Keyword Selection

Database	Keyword used	Search Criteria	Documents extracted
SCOPUS	"microfinance" OR "micro finance" OR "micro-finance" OR "microcredit" OR "micro credit" OR "micro-credit" OR "microbanking" OR "micro banking" OR "microlending" OR "micro lending" OR "micro-lending" OR "microsaving" OR "micro saving" OR "micro-saving" AND "sustainability" OR "sustainable development" Search engine: Scopus database Search date: July 20, 2024	Article title, abstract or keyword	1058

3.3 Inclusion and Exclusion Criteria

In order to ensure the selection of relevant documents, a stringent inclusion and exclusion criterion was applied. Figure 2 showcases that the inclusion criteria comprised English-language articles and review papers, which were published in 2014-2024 and came under Economics, econometrics and finance, Business, management and accounting, and Social sciences. To keep things focused, exclusion criteria were used to weed out the documents other than articles and review

papers, that weren't written in English, weren't finally published, didn't belong to the period from 2014 to 2024, or came under subject areas other than the subjects as mentioned above.



(Figure 2: Data Extraction Process)

3.4 Tools used for analysis

VOS viewer software and Biblioshiny web interface of R Studio are being utilised to perform descriptive and network analysis (Singh & Bashar, 2021; Van Eck & Waltman, 2014). VOS viewer software is used to construct networks of various elements within the field of scientific research, including authors, sources, organisations, and nations etc., and Biblioshiny program is used to process and analyze bibliographic data, then extract the results in tabular and graphical formats for in-depth discussion and further analysis (Bashar & Singh, 2022; Singh & Bashar, 2021).

4. Results and Discussions

4.1 Main information of Data

Table 3: Main information of bibliographic data

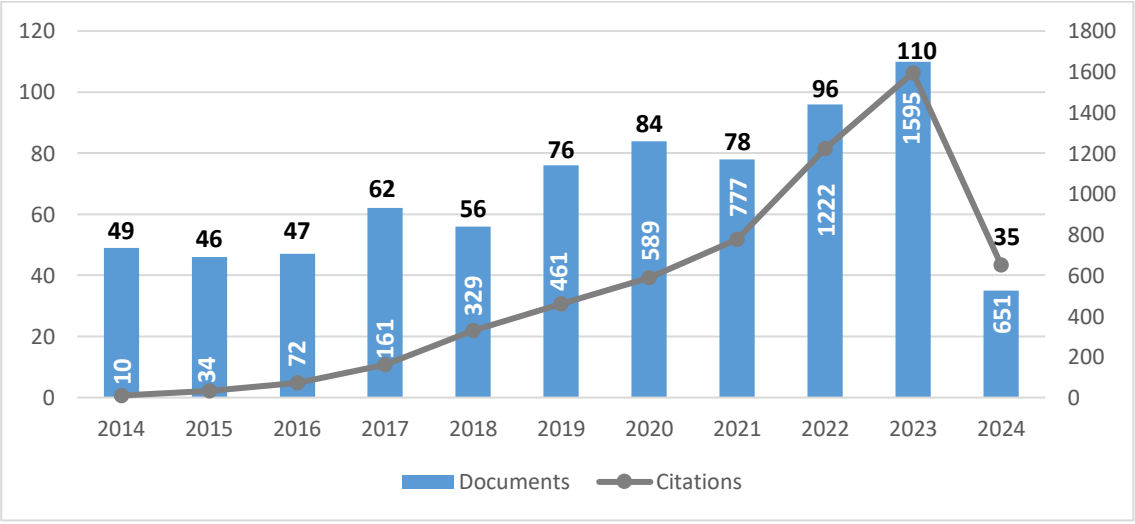
Description	Results
Timespan	2014-2024
Sources (Journals, Books, etc)	268

Documents	458
Annual Growth Rate % (2014-2023)	9.74%
Document Average Age	4.51
Average citations per doc	10.53
References	21558
DOCUMENT CONTENTS	
Keywords Plus (ID)	612
Author's Keywords (DE)	1188
AUTHORS	
Authors	1058
Authors of single-authored docs	82
AUTHORS COLLABORATION	
Single-authored docs	93
Co-Authors per Doc	2.72
International co-authorships %	27.95
DOCUMENT TYPES	
article	440
review	18

The descriptive analysis aims to illustrate the trend of publications, annual citations, most frequently cited documents, most productive authors, sources, and affiliations. The dataset, which is shown in Table 3, consists of 458 documents, that were published by 268 sources over 10 years from 2014 to 2024. This collection of publications was authored by 1058 authors, wherein 93 papers had solitary authorship, while the rest resulted from collaborative efforts, resulting in an average of 2.72 authors per document.

4.2 Year-wise Publication

Figure 3 demonstrates the annual growth of research publications in terms of total publications and citations on microfinance and sustainability. The researchers have shown initial interest in this field since 1994, but this topic received much attention in 2014-2015. This surge can be driven by the United Nations' adoption of the Sustainable Development Goals in 2015. The number of publications steadily rose, peaking in 2023 with 110 publications. Until 2023, the graph shows an upward trend in published research documents after that, around 35 documents have already been published, and this number is projected to rise until the end of the year. This shows that interest in this field has been increasing steadily over the past few years.



(Figure 3: Year-wise publications and citations trend)

4.3 Country-specific publications

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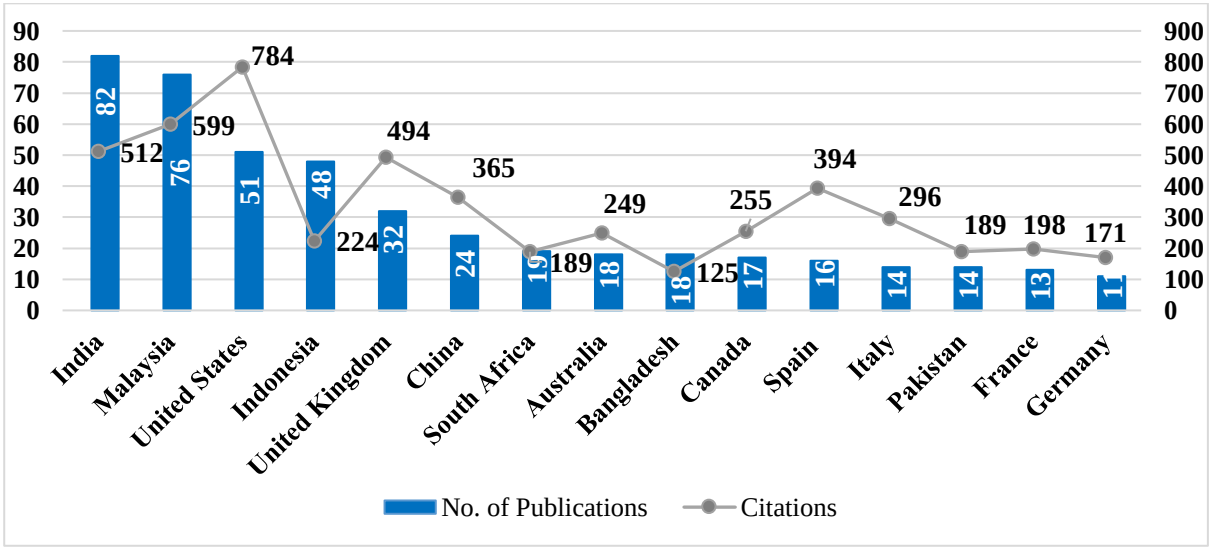
Country-specific publications analysis delineates the distribution of research output across different countries. By considering the country as a unit of analysis, total citations of documents measure the level of interest in a particular field of study. As per Figure 4, India, which had 82 documents published with 512 citations, emerged as the top leading country in terms of research publication in this field. Malaysia, Indonesia, and the United States were the next, with 76, 51 and 48 publications respectively. Considering citations count as a unit of analysis, it reflects the level of popularity among countries. From figure 4, the United States with 784 citations, emerged as the most cited country for its publications, followed by Malaysia, India, and United Kingdom, having 599, 512, and 494 citations respectively.
Overall, a total of 15 nations have published more than 10 documents. Spain has been considered to be the most productive country, with a score of 24.6 (number of publications/total citations), followed by Italy and Germany, with scores of 21.1 and 15.5, respectively. Research in this field has predominantly been conducted in Asian, European, North American, and African countries.



(Figure 4: Country-wise Publication and citation counts)
Furthermore, co-authorship of countries analysis was carried out to determine the groupings of primary countries that contributed to the research on sustainability and microfinance. When the criterion was set to a threshold of at least 2 documents per country and 5 citations per paper, then out of total 87 countries, 52 countries met the criteria. It offers valuable insights to the researchers who are interested in this domain, about possible international collaboration among various countries. Three primary clusters were identified by the research literature, as evidenced by Figure 5.
The red cluster is constituted by seventeen countries headed by India which have a total of 82 publications and 512 citation counts. India has substantial international collaboration with Asian countries (like Malaysia, China, United Arab Emirates, Bangladesh), European countries (like UK, Norway, France, Switzerland, Belgium, Italy), and the United States. The primary focus of this cluster is on MFIs' effectiveness and sustainability in terms of their financial results, community outreach, and social impact, factors affecting the sustainability of MFIs which include corporate governance practices, institutional factors, capital structure, and competition.

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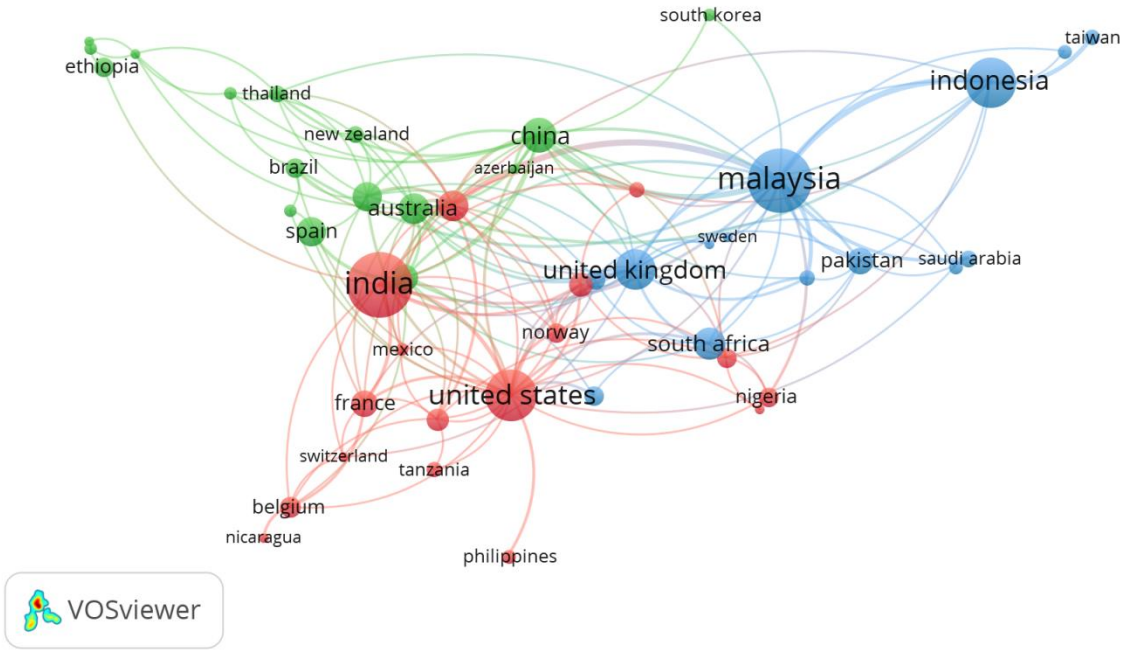

(Figure 5: Co-authorship of Countries network)

The green cluster is formulated from connections among sixteen countries and is headed by China. Within the cluster, China has strong international connections with Australia, South Korea, Canada, Italy and Thailand. This group of countries mostly researched on role of MFIs in promoting financial inclusion, renewable energy, entrepreneurship, and empowerment, the impact of capital leverage, organizational factors and alternative funding sources on the sustainability of MFIs, and crowdfunding and neo-banking as a new avenue for rural and underserved areas. The blue cluster led by Malaysia, showcased collaborations primarily with the Middle East and Southeast Asia countries (Indonesia and Saudi Arabia), the UK, South Africa and Pakistan. This cluster delved into the impact of market orientation, customer protection, female managers and government intervention on Sustainable performance and quality of microfinance, MFI's efficiency from a global perspective and integration of Islamic microfinance principles.

4.4 Most Prolific Authors

The top 10 notable authors, actively engaged in this domain, are showcased in Table 4. The table also includes total citation counts (TC), and number of publications (NP), which are the metrics used to assess the authors' productivity.

Table 4: Top 10 Most Prolific Authors

Authors	NP	TC	Country
Mia MA	18	207	Malaysia
Kamarudin F	6	111	Malaysia
Huruta AD	5	56	Indonesia
Pati AP	5	27	India
Zainal N	5	28	Malaysia
Lensink R	4	85	Netherland
Mersland R	4	148	Norway
Fersi M	4	13	Tunisia
Sangwan S	4	14	India
Awaworyi Churchill S	3	69	Australia

"Mia M A" is the author with the highest count of 18 publications. The author "Kamarudin F", who is ranked second, has garnered notable attention with 6 publications, followed by "Huruta AD", "Pati A P" and "Zainal N", each with 5 publications. As far as citation count is concerned, Mia M.A. is considered the most prolific author, having 207 total citations, followed by Quayes S. and Mersland R., having 149 and 148 citations, respectively. Most of the prolific authors are from Asian countries (Malaysia, Indonesia, India, and China) and European countries (Netherlands, Norway, Italy and Spain).

4.5 Most influential documents

Table 5 showcased the top 10 most frequently cited documents in this domain, along with title of the document, publication source, type of research, and number of citations it received. Widiarto and Emrouznejad (2015) topped the list and emerged as the most cited document with 101 citations. This study measures the performance of Islamic MFIs by comparing them to traditional MFIs utilizing the 'Data Envelopment Approach' and non-parametric tests, to address poverty alleviation while maintaining financial sustainability. Subsequently, Wry and Zhao (2018) having 87 citations, developed a framework predicting compatibility between social outreach and financial sustainability and emphasized trade-off variations across different contexts due to cultural background, market dynamics, and managerial quality in social enterprises.

4.6 Most Prominent Sources

Figure 6 provides a summary of the top 10 sources based on how many articles these sources have been published in this particular domain, along with the Publisher of journal, total citations, and country. The publication "Sustainability (Switzerland)" published by MDPI AG, has produced 23 documents with 326 citations, and "Enterprise Development and Microfinance", has contributed 19 papers with 125 citations, accounting for the first and second-highest number of publications. Likewise, Emerald's "International Journal of Social Economics" has contributed 7 papers with 128 citations to the existing body of knowledge concerning microfinance and sustainability.

Table 5: Top 10 influential documents

Documents	Title	Citations
Widiarto and Emrouznejad (2015)	"Social and financial efficiency of Islamic microfinance institutions: A Data Envelopment Analysis application"	101
Wry and Zhao (2018)	"Taking trade-offs seriously: Examining the contextually contingent relationship between social outreach intensity and financial sustainability in global microfinance"	87
Kamarudin et al. (2021)	"Efficiency of microfinance institutions and economic freedom nexus: Empirical evidence from four selected Asian countries"	83
Quayes (2015)	"Outreach and performance of microfinance institutions: A panel analysis"	80
Fall et al. (2018)	"DEA and SFA research on the efficiency of microfinance institutions: A meta-analysis"	77
Bassem (2014)	"Total factor productivity change of MENA microfinance institutions: A Malmquist productivity index approach"	73
Mild et al. (2015)	"How low can you go? - Overcoming the inability of lenders to set proper interest rates on unsecured peer-to-peer lending markets"	72
Iqbal et al. (2019)	"Financial performance and corporate governance in microfinance: Evidence from Asia"	69
Etzion et al. (2017)	"Unleashing sustainability transformations through robust action"	68
Aracil et al. (2021)	"Sustainable banking: A literature review and integrative framework"	61

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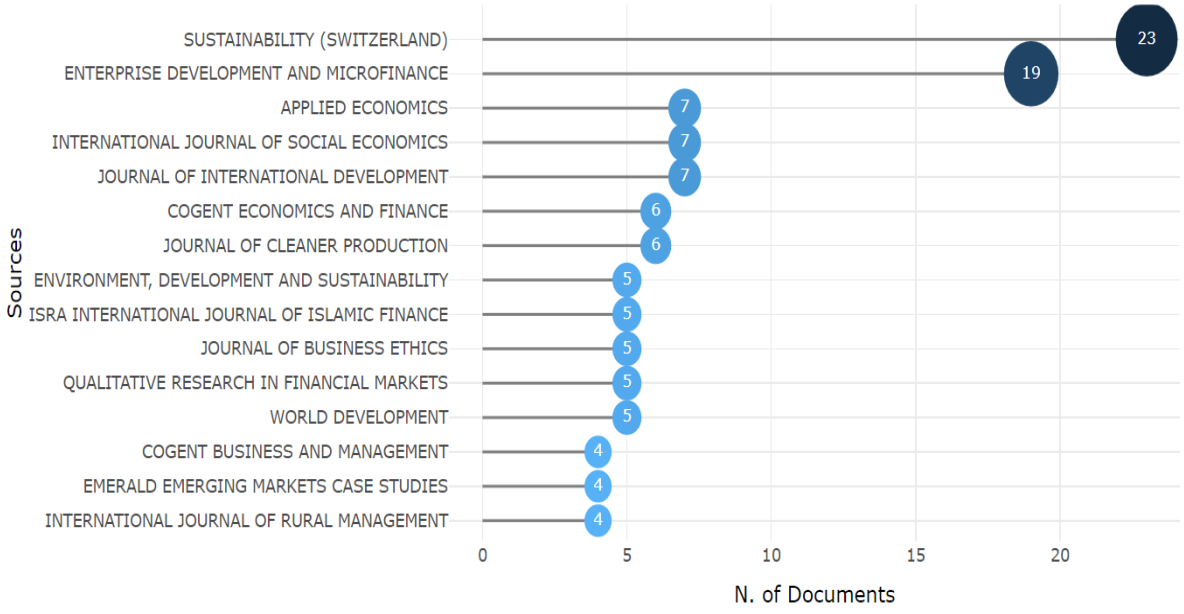

(Figure 6: Top 15 Most Prominent Sources)

4.7 Co-Citation Analysis

Co-citation analysis is a science mapping technique that assumes that the articles that are cited together very frequently are related thematically (Hjørland, 2013) and share the same characteristics to form a cluster (Akter et al., 2021). Co-citation analysis helps not only to identify the most influential publications but also to unveil thematic clusters, enabling business scholars to discern cohesive groups of related research (Donthu et al., 2021b). In this study, Co-citation analysis of cited references was performed to discern clusters within the references. When the threshold was set at a minimum of 15 citations per document, it resulted in the inclusion of 27 references from a pool of 21,333. As depicted in Figure 7, the co-citation map of cited references unveils three distinct clusters denoted by blue, red, and green nodes.

The red cluster encompasses studies focused on investigating the complex landscape of microfinance and examining how it affects efficiency, sustainability, and poverty reduction. This cluster also addresses challenges like mission drift, macroeconomic impacts, and gender imbalances. Likewise, the green cluster comprises research based on navigating the delicate balance between outreach to the underprivileged and financial sustainability (Louis et al., 2013; Quayes, 2012; Quayes, 2015; Widiarto & Emrouznejad, 2015). These studies underscore the potential synergies between financial viability and social impact, emphasising the significance of governance frameworks, performance metrics, and strategic decision-making. (Hartarska, 2005; Mersland and Strøm, 2009). The blue cluster consists of studies focused on examining how regulatory variations and oversight affect financial performance indicators, outreach to underserved communities, and sustainability (Cull et al., 2011; Hartarska & Nadolnyak, 2007).

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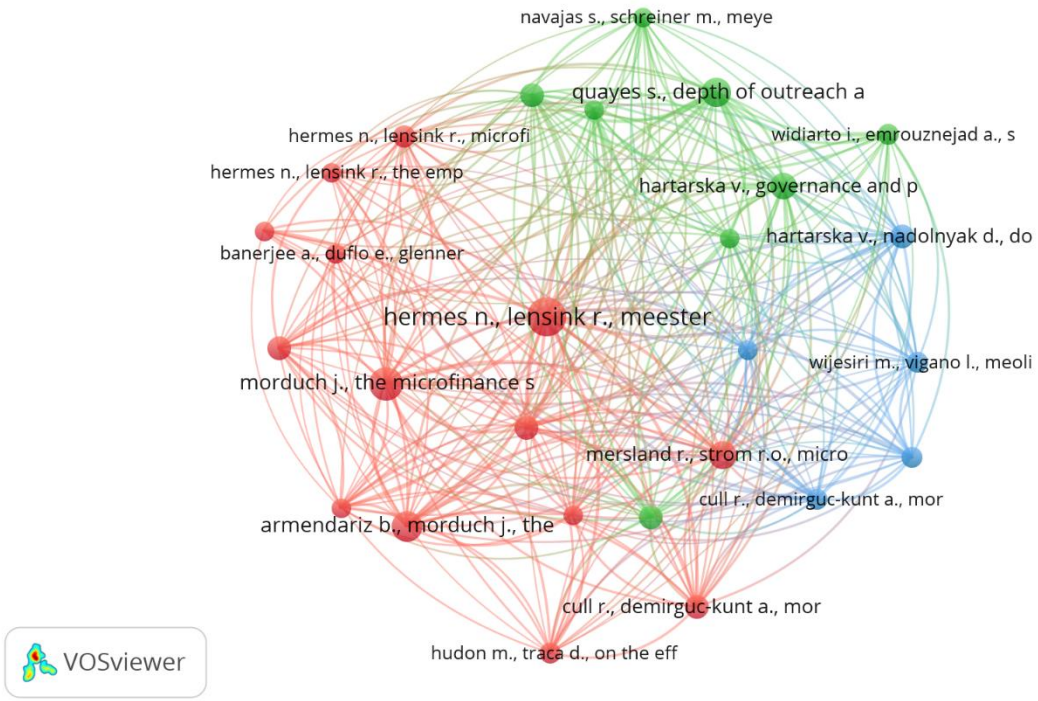


(Figure 7: Co-Citation analysis map)

4.8 Co-occurrence of Keyword Analysis

The co-occurrence of keywords refers to the frequency with which specific terms or keywords appear together in scholarly publications within a given research domain. Co-occurrence of keywords analysis involves using the keywords provided by authors to explore the connections between the main topics within the analyzed domain (Ji et al., 2018; Corvo et al., 2021). This assessment is carried out because, through keywords, one can easily identify the topic and focus of the research publication (Kumar & Sharma, 2023). Co-occurrence of keyword analysis goes further into the core of the publications to uncover underlying patterns, linkages, and thematic clusters among the research under analysis (Donthu et al., 2021b). When the minimum number of keyword occurrences is set at 5, then out of 1652 keywords, 92 met the threshold. Table 6 showcased the top 10 most frequently occurring keywords on this domain and presented that Microfinance is the most frequently occurring keyword with a total of 235 occurrences, 91 total links, and 795 total link strength, followed by Sustainability having 135 total occurrences, 85 total links, and 500 total link strength. The co-occurrence of keywords map revealed four primary distinct clusters distinguished by different colours (red, green, blue, and yellow), which have surfaced from the literature (Figure 8).

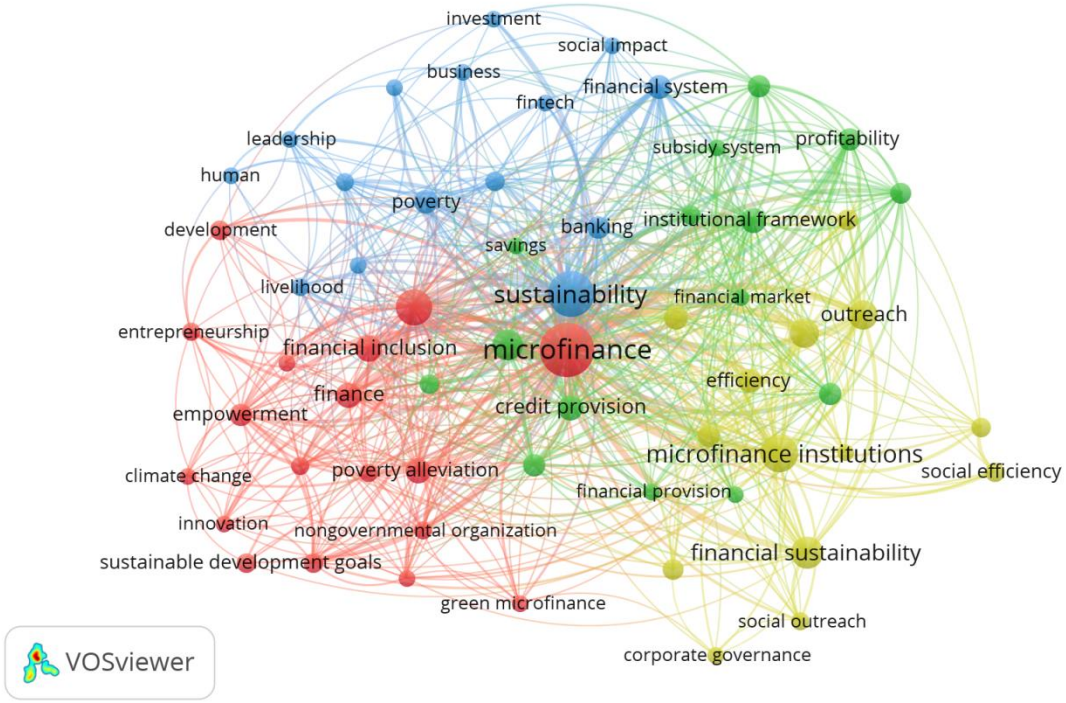
Table 6: Top 10 Most Frequently Occurred Keywords

Keyword	Occurrence	Total Links	Total Link Strength
Microfinance	235	91	795
Sustainability	135	85	500
Microfinance Institutions	75	65	231
Sustainable Development	61	69	236
Financial Sustainability	40	40	101
Microcredit	35	51	119
Outreach	31	41	128
Financial Performance	30	49	128
Financial Inclusion	23	42	74
Credit Provision	21	50	113

Red Cluster

The red cluster is constituted by the following keywords: Microfinance, Green Microfinance, Sustainable Development, Sustainable Development Goals, Poverty Alleviation, Empowerment, Development, Entrepreneurship, Financial Inclusion, Innovation, Climate Change, Finance, and Non-Government Organisations. The central focus is on two elements, i.e., Microfinance and Sustainable development, with occurrence values of 235 and 61, respectively. These keywords indicate that the central focus of this cluster revolves around “Small Loans - Big Impact: Role of

Microfinance in Driving Sustainable Development." The three most popular articles and brief summaries of their respective works within these thematic clusters are presented (Table 7). Etzion et al. (2017), having 68 citations, explored a new approach, "robust action", with a focus on embracing ambiguity, short-term accomplishments, and oblique movement, to achieve sustainable transformations. Further, the study investigated the effectiveness of robust strategies in the context of wind power, microcredit and sustainability reporting. García-Pérez et al. (2018), with 39 citations, examined the contributions of microfinance research to sustainability, pointing out knowledge gaps and suggesting future research directions aligning with the Global Reporting Initiative framework and EESG standards.



(Figure 8: Co-occurrence of keyword map)

Green Cluster

The green cluster is formed by the following keywords: Credit Provision, Financial Market, Financial Policy, Financial Provision, Institutional Framework, Interest Rates, Lending Behaviour, Microcredit, Savings, Subsidy System, Trade-off, Profitability and Performance Assessment, etc. These keywords suggest that the primary focus of the cluster could be "Trade-offs between profitability and social performance in MFIs." Within this cluster, Wry and Zhao (2018), having 87 citations, developed a framework predicting compatibility between social outreach and financial sustainability, and emphasized trade-off variations across different contexts due to cultural background and market dynamics. Quayes (2015), having 80 citations, studied the relationship between performance and outreach of MFIs and revealed that increased outreach has a significant impact on financial performance, but institutions' financial goals might impede outreach initiatives.

Blue Cluster

The blue cluster includes the following keywords: Sustainability, Banking, Fintech, Financial System, Investment, Economic Growth, Business, Small and Medium Enterprise, Social Impact, Poverty, Leadership, Decision Making, and Stakeholder. These keywords suggest that the primary focus of this cluster revolves around the theme "Financial Inclusion and Sustainable Microfinance Practices: Enhancing Economic Growth." Under this cluster, Aracil et al. (2021) garnered 61 citations and classified sustainable banking literature into nine thematic areas across three domains, i.e., sustainable products, ethical foundations, and business cases. Having 43 citations, Lopez and Winkler (2018) investigated whether financial inclusion in rural areas has more sustainability challenges than in urban areas. The findings revealed that MFIs with a large rural customer base face challenges in taking advantage of economies of scale compared to urban users.

Yellow Cluster

The yellow covered the keywords like Corporate governance, Governance, Microfinance institutions, financial performance, financial services, financial sustainability, financial efficiency, social efficiency and social outreach. These keywords suggest that the central theme of the cluster could be "Enhancing Financial and Social Efficiency in

MFIs through Effective Corporate Governance." Within this cluster, Widiarto and Emrouznejad (2015) secured 101 citations and measured the performance of Islamic Microfinance Institutions by comparing them to traditional Microfinance Institutions utilizing the Data Envelopment Approach and non-parametric tests, to address poverty alleviation, while maintaining financial sustainability. Iqbal et al. (2019), having 69 citations, investigated the relationship between corporate governance and financial performance among MFIs in Asia and revealed that there is an endogenous relationship between corporate governance and financial performance, which shows that MFI sustainability and profitability increase with good governance procedures.

Table 7: Co-Occurrence of Keyword analysis

Thematic Clusters	Authors	Title	Total Citations
"Small Loans - Big Impact: Role of Microfinance in driving sustainable development"	Etzion et al. (2017)	"Unleashing sustainability transformations through robust action"	68
	García-Pérez et al. (2017)	"Microfinance literature: A sustainability level perspective survey"	39
	Dutta and Banerjee (2018)	"Does microfinance impede sustainable entrepreneurial initiatives among women borrowers? Evidence from rural Bangladesh"	38
"Trade-offs between financial and social performance in MFIs"	Wry and Zhao (2018)	"Taking trade-offs seriously: Examining the contextually contingent relationship between social outreach intensity and financial sustainability in global microfinance"	87
	Quayes (2015)	"Outreach and performance of microfinance institutions: a panel analysis"	80
	Mia and Chandran (2016)	"Measuring Financial and Social Outreach Productivity of Microfinance Institutions in Bangladesh"	44
"Financial Inclusion and Sustainable Microfinance Practices: Enhancing Economic Growth"	Aracil et al. (2021)	"Sustainable banking: A literature review and integrative framework"	61
	Lopez and Winkler (2018)	"The challenge of rural financial inclusion – evidence from microfinance"	43
	Gálvez-Sánchez (2021)	"Research advances on financial inclusion: A bibliometric analysis"	38
"Enhancing Financial and Social Efficiency of MFIs through Effective Corporate Governance"	Widiarto and Emrouznejad (2015)	"Social and financial efficiency of Islamic microfinance institutions: A Data Envelopment Analysis application"	101
	Iqbal et al. (2019)	"Financial performance and corporate governance in microfinance: Evidence from Asia"	69
	Wijesiri et al. (2017)	"Assessing the financial and outreach efficiency of microfinance institutions: Do age and size matter?"	58

5. Conclusion

This section encapsulates the summary of the study's findings. The growth of the scientific output on microfinance and sustainability literature, and associated topics reached its peak in 2023, marked by a substantial increase in the number of publications. It is evident from the study that there is global engagement in this domain, with leading countries like India, Malaysia, the United States, Indonesia, the United Kingdom, and China being the most productive nations in this domain. Based on the tabulated statistics, the majority of the documents were co-authored, with a mere 20.3% being authored by a single person and around 80% of the total documents were the result of collaborative efforts, suggesting a substantial level of collaboration in this area of research. At the forefront, Mia M. A. has emerged as the leading author in this field, holding the top position and having the most citations, followed by Kamarudin F and Huruta A. D. The journal "Sustainability (Switzerland)" published by MDPI AG, has diffused maximum number of documents followed by "Enterprise Development and Microfinance" published by Practical Action Publishing produced the second-highest number of publications. Knowledge foundations and thematic clusters have been effectively established by thorough analyses, including co-occurrence of keyword analysis and co-citation analysis. Our study findings revealed the presence of four thematic clusters, each containing more than ten keywords and heading towards "Small Loans - Big impact: Role of Microfinance in driving sustainable development," "Trade-offs between financial and social performance in MFIs," "Financial Inclusion and Sustainable Microfinance Practices: Enhancing Economic Growth," and "Enhancing Financial and Social Efficiency of MFIs through Effective Corporate Governance."

6. Managerial Implications, Limitations and Future Research Directions

The present study provides the most frequently researched topics and themes within the area of microfinance and sustainability. These insights make it easier for researchers and business professionals to stay informed about new trends and subject areas of interest. By using the study's insights, policymakers and business professionals can frame evidence-based policies and regulations that promote sustainable microlending practices in MFIs and create initiatives that integrate sustainability factors like environmental, social and governance standards into their lending procedures, saving products, insurance offerings and other financial services. Additionally, they may find the current research useful as a compass to guide them in decision-making about the governance framework of their MFIs. This study can also yield valuable insights for academic advancement. These insights could act as a spark for the researchers to explore the unexplored areas of the corpus of existing research.

Despite its numerous valuable contributions, it's essential to acknowledge the presence of certain limitations in this study. Since the data used for analysis came solely from the Scopus database, it may be possible that some significant documents that are listed in other databases were missed. Another possible limitation is that this study considered only journal-published articles and review papers written in the English language as a source of data collection. Lastly, due to our limited scope of data mining in the analysis, which focused exclusively on examining the title, abstracts, and keywords instead of conducting a comprehensive analysis of the entire text, it's possible that certain crucial ideas and trends may differ when compared to data mining that involves analysing the whole text. This study also provides directions for future research, which are mentioned below:

Innovative Funding Mechanisms for Scaling Sustainable Microfinance Initiatives:

In recent years, there has been a growing recognition of the critical role of microfinance in promoting sustainable development, especially in marginalized areas. However, limited access to capital makes it less scalable. Conventional funding sources are insufficient to scale up these projects to achieve significant impacts. In order to bridge this gap and to advance microfinance initiatives towards broader sustainable development goals, it becomes necessary to explore innovative funding options like impact investing and Social Impact Bonds (SIBs). Therefore, further research should focus on exploring alternative funding channels like social impact bonds (SIBs) and impact investment to expand microfinance programs sustainably. Public-private partnerships are used in SIBs to achieve quantifiable social goals and to attract socially concerned investors. Impact investment channelize the fund to sustainable microfinance initiatives by aligning their financial returns with social and environmental effects.

Internal Governance Mechanism:

Various studies have examined the formal governance framework of microfinance institutions and its impact on the performance and sustainability of MFIs (Mersland & Strøm, 2009; Labie & Mersland, 2011; Gupta & Mirchandani, 2020). There should be further research on examining how the variations in the corporate governance framework affect the Key Performance Indicators (KPIs) such as loan portfolio quality, outreach of marginalized communities, and financial sustainability.

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