Issues and Perspectives in Business and Social Sciences

Unboxing the sustainability trends of small and medium enterprises' environment, social and governance reporting: bibliometric and visualisation insights

Lei Ping Leow[1*], Sin Yin Teh[2]

[1] *Faculty of Accountancy, Finance and Business, Tunku Abdul Rahman University of Management and Technology, Malaysia.*

[2]*School of Management, Universiti Sains Malaysia, Malaysia*

[*]*correspondence: leowlp@tarc.edu.my*

Abstract

There has been heightened attention on global warming amidst expanding commercial activities at the forefront of human civilization. While small and medium enterprises (SMEs) drive economic growth in most nations, they inevitably leave a huge carbon footprint behind in the process. Nonetheless, awareness of the importance of sustainability is still slow and lacking in SMEs, partly due to environmental, social, and governance (ESG) reporting being voluntary in most countries. This study aims to unravel the trends of sustainability and ESG surrounding SMEs via bibliometric and visualization analysis, supported by a literature review, based on a dataset extracted from the Scopus database. The findings revealed 11 diverse yet disparate network clusters with environmental management, financial sustainability, and economics as some of the trending keywords. With SMEs' role in sustainability continuing to create headlines, it is expected that research in these areas will gain momentum in the near future. It is imperative for SMEs to be proactive in implementing and strengthening their ESG reporting capacity as a way forward because of its profound effects on SMEs' future of SMEs in terms of long-term financial performance and enterprise resilience.

Keywords:
ESG;
SCimago Graphica;
SMEs;
Sustainability;
Bibliometric;
VOSviewer.

Received
April 8, 2025

Accepted
November 14, 2025

Published
December 12, 2025

1. Introduction

Sustainability has become a mainstream practice, with multiple enterprises jumping on the ESG reporting bandwagon to meet various stakeholders' rising concerns about climate change and environmental degradation caused by carbon emissions (Neisen et al., 2022). Simultaneously, the growing recognition of the significance of ESG reporting to an enterprise's long-term financial value further contributes to its rising popularity (Edmans, 2023). In 2015, world leaders adopted the 2030 Agenda for Sustainable Development and its 17 Sustainable Development Goals (SDGs), serving as a roadmap for the common understanding that sustainable development should integrate economic growth, social well-being, and environmental protection (World Commission on Environment and Development, 1987). Sustainable development refers to development that fulfills the current generation's needs without jeopardizing future generations' capacity to meet

doi: https://doi.org/10.33093/ipbss.2026.6.1.13

URL: https://journals.mmupress.com/index.php/ipbss

their own needs (United Nations, 2024). This will pave the way toward achieving well-balanced objectives of the 5Ps, namely People, Planet and Prosperity, Peace and Partnerships (Urata et al., 2023).

Sustainable development is closely related to ESG principles, as ESG is seen as an enabler for promoting SDGs in the industry (Qiu, 2024). Investors use sustainable reporting to assess enterprises across three core pillars: Environmental, Social and Governance (Pollman, 2024). The environmental pillar measures an enterprise's efforts to conserve the Earth's natural resources to reduce climate change and carbon footprint, while the social pillar considers people and relationships, such as diversity and inclusion, relations with communities, and employee rights (Raghavendra & Ting, 2023). Finally, the governance pillar encompasses standards for running an enterprise such as board structure, policy availability, business ethics, and supply chain management (Pérez et al., 2022). Despite this hype, an evaluation of SDGs' progress in 2024 highlighted that the world is seriously behind the target toward achieving the 2030 agenda, with only 17 percent of the targets showing sufficient progress for achievement by 2030 (United Nations, 2024).

Although big enterprises have been progressive in sustainability reporting owing to factors such as compulsory reporting requirements and competition, small and medium enterprises (SMEs) in general still have a slow adoption rate (Shari et al., 2024). Although ESG reporting has become a necessity for SMEs, its implementation state is still fragmented (Akilah, 2024). As noted by Hassan et al. (2023), the adoption of sustainable practices by SMEs remains limited and faces various challenges (Hassan et al., 2023). Much focus has been placed on large corporations, resulting in SMEs' role in advancing sustainability. Hence, this bibliometric study offers a bird's eye view of the current trends in SMEs' sustainability reporting, with the aim of highlighting the relevant strengths and weaknesses.

In general, there has been notable oversight concerning SMES' role of SMEs in sustainability despite their dominance in the business landscape (Shari et al., 2024). High economic activity also simultaneously translates to an equal amount of resource consumption and waste production (Shari et al. 2024), placing significant pressure on the world's ecosystems. Hence, it is appropriate to shift the focus to the role that SMEs play in ESG reporting to create a more sustainable world. Along with the recognition that SMEs play an indispensable role in fuelling the nation's economy (Hamid & Ahmed, 2024; Kato et al., 2024), they also contribute significantly to greenhouse gas emissions. SMEs account for 60–70% of global carbon emissions (Ozkan et al., 2023; Wang et al., 2021), and collectively, they produce carbon footprints that are five times higher than their larger counterparts (Kato et al, 2024).

SMEs reap various benefits by practising sustainability. For instance, studies have found that more human-centric entrepreneurship in SMEs could lead to better financial and non-financial success, apart from an increased public image (Bjelic et al., 2025). Nonetheless, a disclosure gap in sustainability reporting exists among enterprises, as it is still not mandatory for SMEs (Ozkan et al., 2023). According to Bollazzi and Risalvato (2018), green enterprises formed the most significant portion of the 16 SMEs listed in the Italian stock exchange, contributing to a third of its revenue, but only seven enterprises during the period of observation during their research took the initiative in preparing sustainability reports.

The extant literature has revealed various challenges in integrating ESG practices among SMEs. Setyaningsih et al.'s (2023) study on the challenges that SMEs face in carrying out sustainability accentuated six types of barriers: general attitude, financial, knowledge and technology, organizational, socio-environmental, and policies. Various studies have found a lack of awareness, knowledge, and expertise in SMEs to be contributing factors (Jones et al., 2023; Shari et al., 2024; Yip et al., 2024). This could stem from the belief held by entrepreneurs that larger enterprises should bear the main responsibility of practising sustainability due to better budgets,

skilled labor, and favorable government policies (Bjelic et al., 2025). SMEs also face resource constraints such as limited capital and human resources to fully comply with ESG measurement criteria, resulting in unstructured and non-standardized data (Tsang et al., 2023). Furthermore, the lack of a standardized format in ESG reporting exacerbates confusion for SMEs that are already grappling with resource constraints (Olanrewaju et al., 2024). Another challenge is the lack of proper enforcement and monitoring (Yip et al., 2024). For instance, Shari et al. (2024) stated that banking institutions had been instructed to carry out ESG screening for SMEs applying for loans and that a proper mechanism for consistent monitoring was lacking.

This study aims to identify the current issues and trends surrounding ESG reporting and sustainability among SMEs. This study seeks to provide a literature review and bibliometric and visualization overview of ESG and sustainability trends in SMEs based on a dataset containing articles and book chapters extracted from Scopus, a multidisciplinary and trusted database. Scopus was chosen for its comprehensive coverage of high-quality peer-reviewed sources across a wide range of disciplines, ensuring a robust and reliable dataset. VOSviewer was used to analyze the publication data. In addition, an in-depth analysis of the publication trends and citation structure of the Scopus database was performed. Based on VOSviewer's mapping analysis, the thematic links of the major discussions in Scopus articles were analyzed by examining the co-occurrences of author-specified keywords supported by a relevant literature review. Subsequently, trending terms based on word frequency and geographic maps of publication countries were generated using SCimago Graphica.

The remainder of this paper is organized as follows. Section 2 explains the research methodology and Section 3 presents the descriptive and network results. This is followed by a brief discussion of the findings in Section 4. Finally, the conclusions of the study are highlighted in Section 5.

2. Research methods and data source

In this study, we performed bibliometric and visualization analyses using VOSviewer and SCimago Graphica as the research methods. Bibliometric techniques and science mapping are popular and rigorous techniques employed by researchers to provide the intellectual structure of a given research topic by compiling a bibliography to support theoretical discussion (Pessin et al., 2022). In addition to enabling the exploration and processing of large quantities of scientific data, bibliometric analysis aids in discovering emerging trends in a particular field (Donthu et al., 2021).

VOSviewer is a software tool used to create, visualize, and explore maps based on network data (Van Eck & Waltman, 2022). VOSviewer can be used to construct networks of scientific publications, journals, researchers, research organizations, countries, keywords, or terms connected by co-authorship, co-occurrence, citation, bibliographic coupling, or co-citation links (Van Eck & Waltman, 2022). Two standard weight attributes, namely link attributes (the number of links of an item with other items) and the total link strength attribute (the total strength of the links of an item with other items), are employed to graphically visualize the nodal network in VOSviewer (Van Eck & Waltman, 2022). In contrast, SCimago Graphica was utilized for geographic and keyword trend visualization in this study. It serves as a useful tool for communicating data visually in a quick and easy manner, using simple drag-and-drop interactions (Hassan-Montero et al., 2022).

The dataset identified in this study was extracted from Scopus, one of the largest research citation data sources founded by Elsevier in 2004, and used by researchers from top universities and research institutions globally (Schotten et al., 2017). Scopus started off with 27 million indexed items in 2004 (Schotten et al., 2017) and has added about 3 million items annually since its inauguration (Singh et al., 2021). The papers were selected based on three criteria: (i) the papers

must be written in English, as most prestigious journals are written in English, (ii) published between 2015 and 2025 to ensure contemporary relevance, and (iii) focused on themes revolving around SMEs, sustainability, and ESG, as these are the core areas of the study. As for the exclusion criteria, dissertations, working papers and reports were excluded due to lack of peer-reviewed scholarly evidence.

Three key terms, namely "SME" AND "ESG" AND "sustainability," and with the document types specified as "Article" or "Book Chapters" produced 18 articles and book chapters between 2018 and 2025. Figure 1 shows the publication record count and corresponding citation count for each year. Based on Figure 1, the trend of ESG reporting and sustainability has gained traction since 2018, picking up speed since 2021, and reaching its peak in 2024.

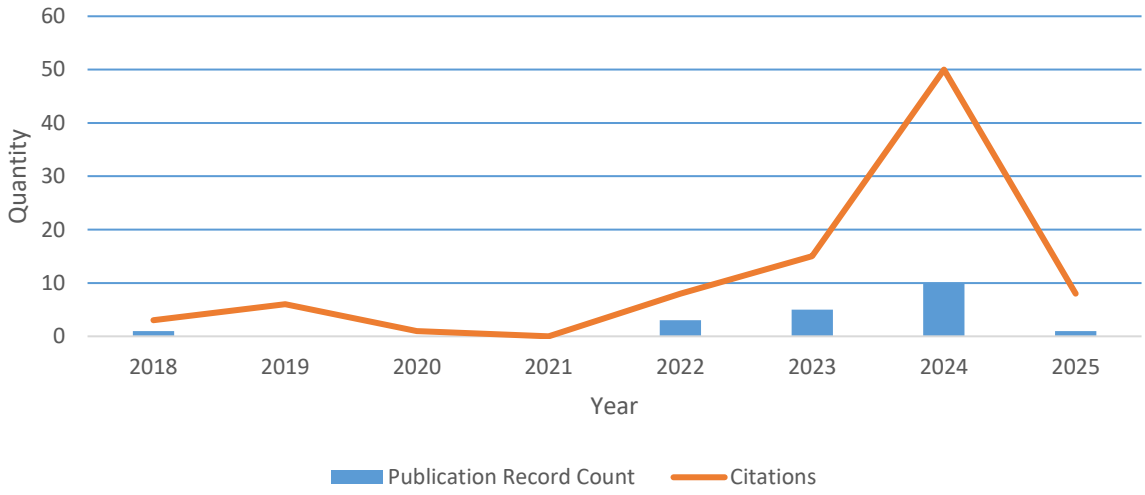

Figure 1: Publication year and corresponding citations according to year

3. Results

Table 1 shows the research areas of the articles and the book chapters. Business, management, and accounting were the most popular areas, comprising 19% of the literature. Environmental science and social sciences are tied in the second and third places, with 17% each.

Table 1: Categories of the studies

Research Areas	Record Count	Percentage (%)
Business, Management and Accounting	9	18.80
Environmental Science	8	16.7
Social Sciences	8	16.7
Economics, Econometrics and Finance	7	14.6
Decision Sciences	5	10.4
Computer Science	3	6.3
Agricultural and Biological Sciences	2	4.2
Energy	2	4.2
Arts and Humanities	1	2.1
Biochemistry, Genetics and Molecular Biology	1	2.1
Mathematics	1	2.1

Figure 2 shows the affiliations of the authors involved in the publications. The top authors originated from Europe, with the top three institutions having two affiliations: Katolicki Uniwersytet Lubelski Jana Pawła II, Uniwersytet Szczecinski and West Pomeranian University of Technology, Szczecin, all based in Poland.

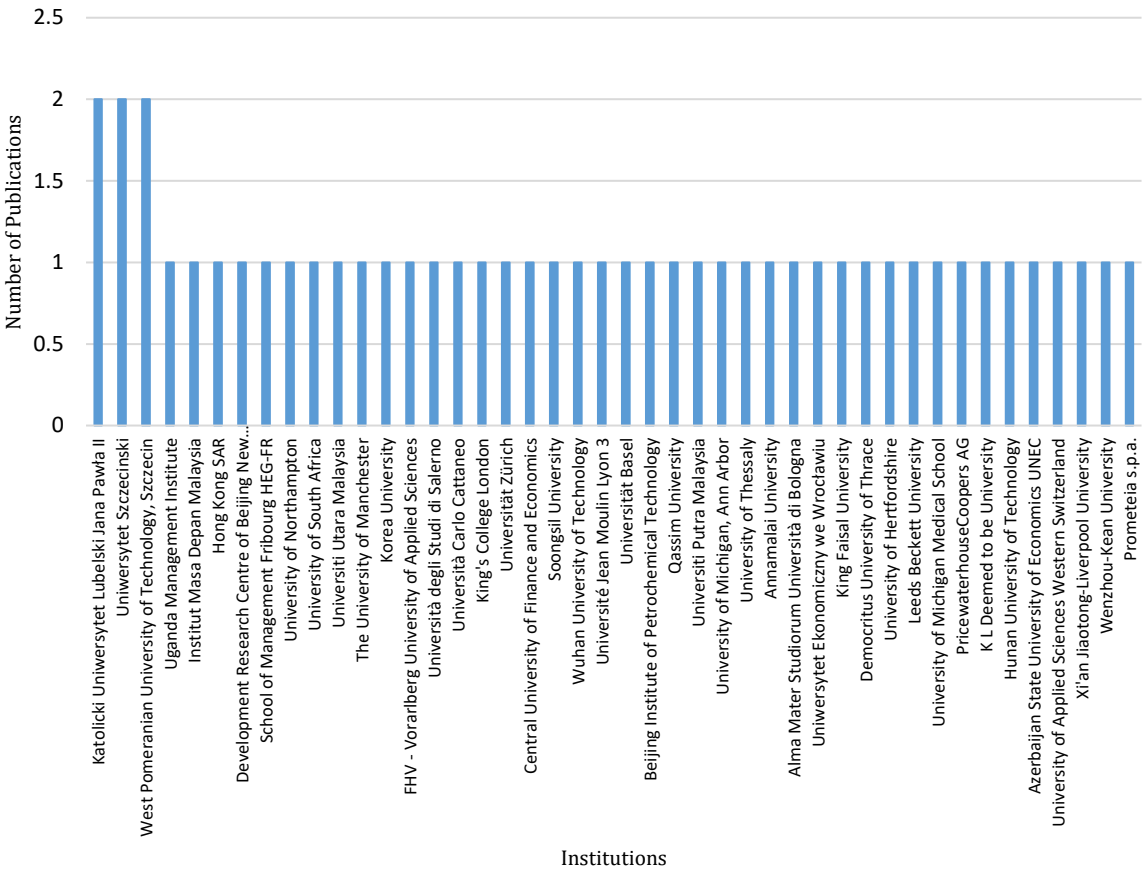

Figure 2: Authors' affiliation

Figure 3 shows the countries of publication. A large majority of the publications are concentrated in Western countries, such as the United States of America, and European countries, such as the United Kingdom, Germany, Austria, Italy, Poland, France, and Greece. Nonetheless, the topic is also gaining traction in Asian countries such as India, China, South Korea, and Malaysia.

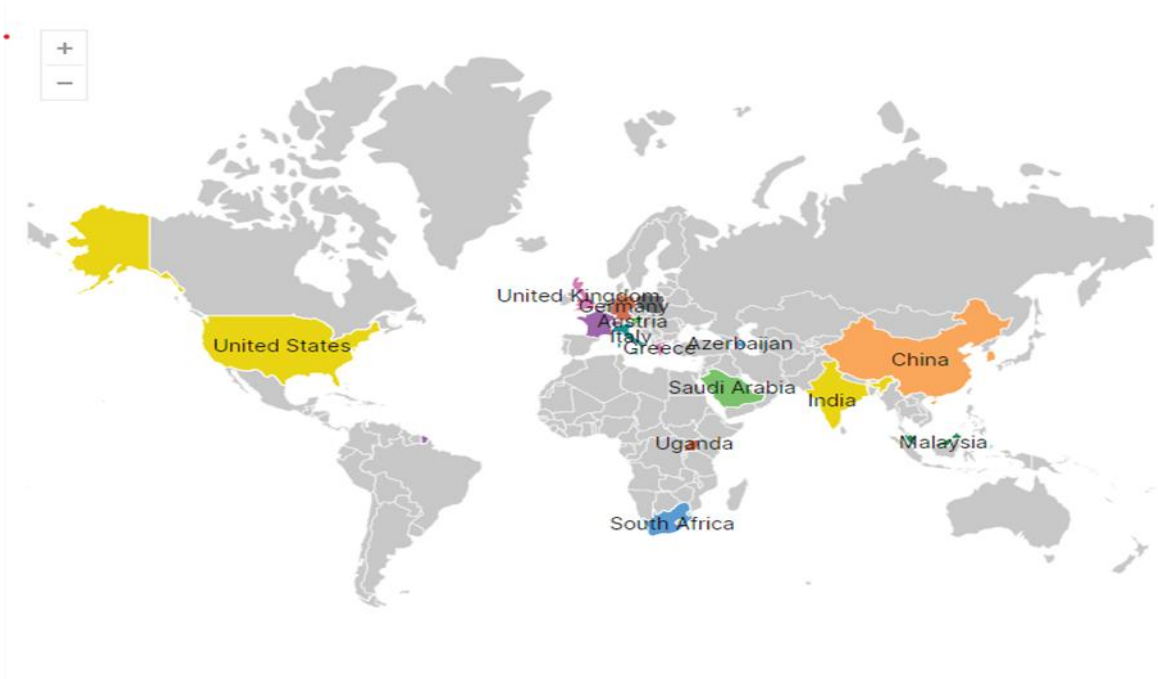

Figure 3: The publication countries

Within the keyword co-occurrence network, there are eleven clusters. Figure 4 shows the keyword co-occurrence network generated by the VOSviewer. In VOSviewer, items are grouped into non-overlapping clusters, with each cluster containing a group of items on a map. In other words, an item may belong to only one cluster (Van Eck & Waltman, 2022). With the minimum number of keyword occurrences set at one, this resulted in 174 keywords in 11 clusters, as summarized in Table 2.

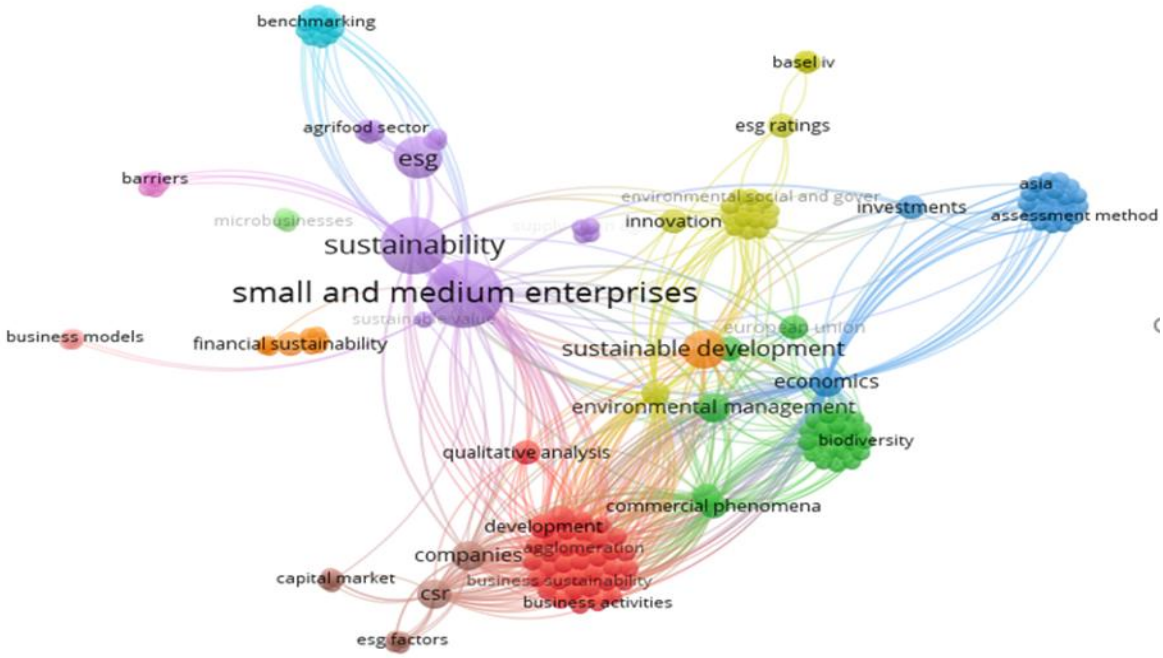

Figure 4: Keyword co-occurrence network

Table 2: Clusters generated by VOSviewer

Cluster	No. of Items	Representative Colour in Figure 4
1	36	Red
2	27	Green
3	23	Blue
4	22	Purple
5	18	Mustard green
6	13	Cyan
7	11	Orange
8	10	Brown
9	6	Pink
10	4	Light pink
11	4	Light green

For Cluster 1, some of the main keywords were qualitative analysis (total link strength = 51, occurrences =2), development (total link strength = 49, occurrences = 2), and environmental health (total link strength count = 49, occurrences = 2).

Cluster 2 included keywords such as environmental management (total link strength = 95, occurrences = 3), commercial phenomena (total link strength = 73, occurrences = 2), the European Union (total link strength = 50, occurrences = 2), and the environment (total link

strength = 36, occurrences = 2). For Cluster 3, the major keywords were economics (total link strength = 97, occurrences = 3) and investments (total link strength = 46, occurrences = 2).

Next, Cluster 4 with 22 items, contains keywords such as economic and social effects (total link strength = 67, occurrences = 2), innovation (total link strength = 30, occurrences = 2), and ESG ratings (total link strength = 27, occurrences = 2). For Cluster 5, the keywords encompassed ESG (total link strength = 42, occurrences = 6s), small and medium enterprises (total link strength = 183, occurrences = 15), and sustainability (total link strength = 128, occurrences = 11). Cluster 6 revealed 13 keywords of equal strength: benchmarking, calibrated benchmarking, corporate sustainability assessment, coexistence, ecological footprint, footprint, handprint, model arbitration, parameterization, rating bias, SDG, sustainable development, and transparency (total link strength = 15, occurrences = 1).

Cluster 7 contains eleven main keywords. The primary keywords were financial sustainability (total link strength = 12, occurrences = 2) and sustainable development (total link strength = 127, occurrences = 5). This was followed by Cluster 8 with main keywords such as companies (total link strength = 54, occurrences = 3) and Corporate Social Responsibility (CSR) (total link strength = 55, occurrences = 3).

Cluster 9 contains six keywords of equal strength: barriers, drivers, ESG reporting, Hong Kong, motivation, and small-cap companies (total link strength = 7, occurrences = 1). Cluster 10 contained four keywords of equal strength: business models, circular economy, strategic management accounting, and sustainable performance management (total link strength = 4, occurrences = 1). Finally, Cluster 11 comprised four keywords of equal strength: microbusinesses, net zero, small business, and stakeholders (total link strength = 4, occurrences = 1).

Figure 5 illustrates the keyword co-occurrence network overlay with the color bar at the bottom-right corner, denoting the timeline. Examination of the overlay network revealed the top five items. The top items were small and medium enterprises (total link strength = 185, occurrences = 25), followed by sustainability (total link strength = 129, occurrences = 11), and sustainable development (total link strength = 129, occurrences = 5). The fourth and fifth most important terms are economics (total link strength = 99, occurrences = 3) and environmental management (total link strength = 97, occurrences = 3). Figure 6 depicts a keyword cloud map generated using SCimago Graphica for greater clarity.

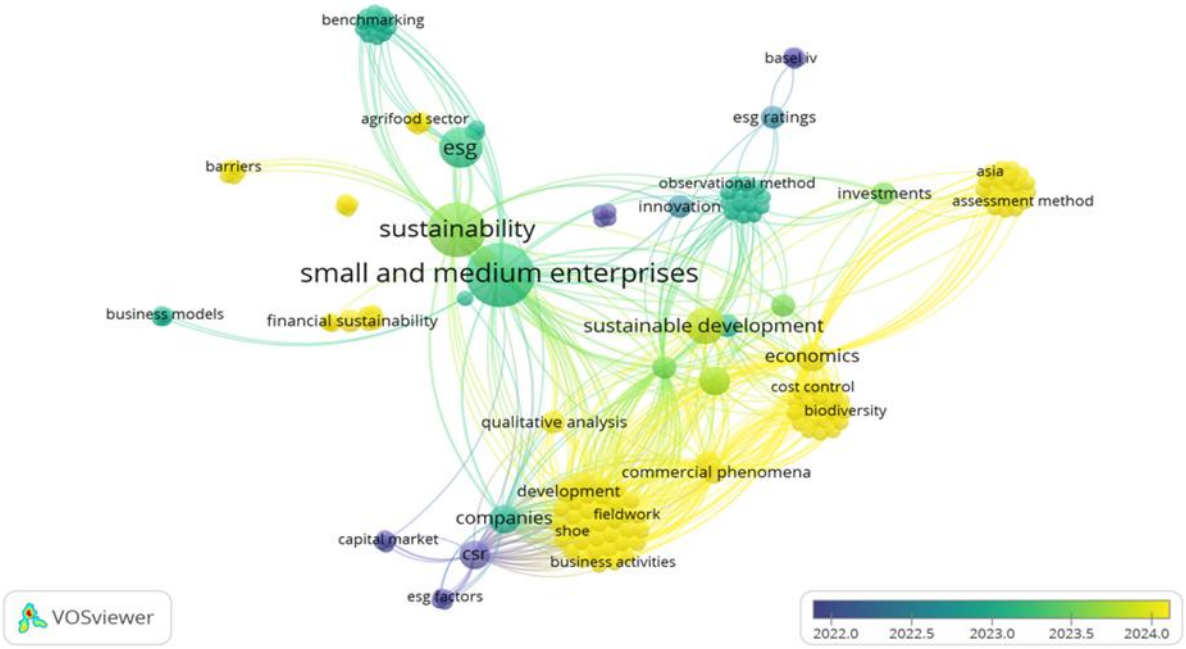

Figure 5: Keyword co-occurrence overlay

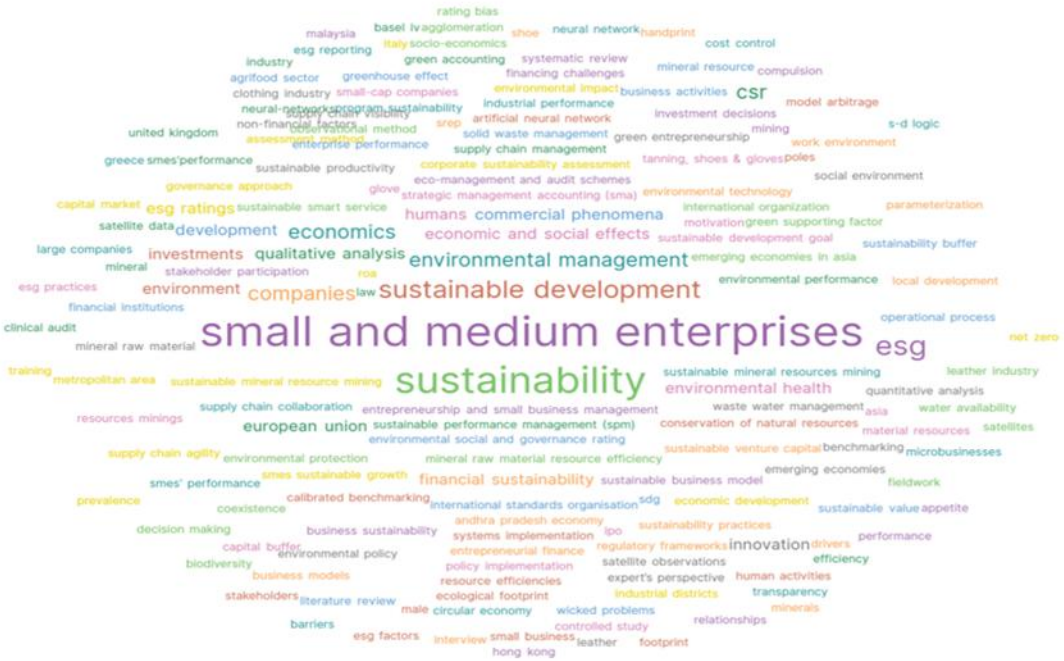

Figure 6: Keyword cloud map

4. Discussion

Based on the visualization analysis using VOSviewer, the purpose of this study is to investigate and analyse the current issues and future trends of sustainability and ESG among SMEs. Co-occurrence analysis of the terms generated 11 clusters. The existence of a large number of clusters in VOSviewer indicates that the data have more distinct and well-separated themes in the network and that the structure is more diverse and complicated (Van Eck & Waltman, 2022). Apart from the main key terms of SME, sustainable development, and sustainability, other prominent key terms in the generated clusters include economics and environmental management. The topics covered by these clusters represent a wide-ranging coverage of sustainable development, environmental health, and the economic and social effects on financial sustainability. This implies that research areas on SME are still disparate as the topics on sustainability and ESG have only recently gained attention among SMEs.

Regarding the sustainable development theme in Cluster 1, Sklavos et al. (2024) stated that digital transformation has been recognized as one of the critical factors that could brighten the growth and development prospects of SMEs. Studies have found that SMEs play a vital role in preserving the environment (Hamid & Ahmed, 2024). A review of the literature reveals that qualitative analysis remains a popular method used to obtain experts' opinions about the drivers and challenges SMEs face in ESG reporting (see Shari et al., 2024; Yip et al., 2024). Edmans (2023) asserts that qualitative ESG assessments could bring long-term returns and are less prone to market mispricing.

As for Cluster 2, the extant literature shows a handful of studies on SMEs focused on the European Union (Jones et al., 2023; Ozkan et al., 2023), signalling the prominence of ESG reporting in the region. Moreover, Bak et al. (2022) reported that the impact of ESG factors on enterprises' business models was stronger for European countries, as the practice of integrating ESG in business models was more prevalent in Europe than in Asia. The inclusion of sustainability and ESG in enterprises' business models indicates that these issues are becoming not just secondary but important commercial considerations for most enterprises. Several publications in this dataset also focused on environmental management systems (see for example, Joy-Camacho & Thornhill, 2024). Ozkan et al. (2023) asserted that the environmental pillar of ESG plays an important role in climate change research. Ozkan et al. (2023) proposed a novel, objective, and consistent approach for compiling environmental data from Copernicus satellite observations, an earth monitoring program managed by the European Union. This approach could eliminate subjectivity in environmental management measurement rubrics.

Regarding Cluster 3, past studies have shown that environmentally responsible enterprises produce a higher average return on assets compared to those that are not (Bollazzi & Risalvato, 2018), emphasizing the importance of practising sustainability and ESG reporting in SMEs. The keywords in Cluster 4 indicate that eco-innovation could present SMEs with the opportunity to reduce environmental pollution and improve environmental compliance. In the United Kingdom, it was found that SMEs spur eco-innovation and transform environmental awareness within broader markets, as they comprise the majority of clean technology enterprises (Joy-Camacho & Thornhill, 2024). Research has also shown that enterprises need to strive for continuous improvement and innovation in the context of environmental issues to drive their sustainability ratings. According to Jo and Kwon (2022), environmental issues will be important for manufacturers in Asia over the next few decades, driven by external pressures and the government's green growth policies. Hence, the capability to collaboratively produce green innovation, which refers to the development of new ideas, goods, services, processes, or management that can be used to deal with environmental problems, could act as a key factor in securing an enterprise's competitive advantage and increased reputation in the global marketplace (Jo and Kwon, 2022).

Additionally, Bak et al. (2022) found that social factors formed one of the key components of SMEs' business models. Hamid and Ahmed (2024) revealed that SMEs play a key role in economic development in their respective regions by providing job opportunities and income generation. SMEs contribute socially by enhancing family stability and supporting social responsibility (Hamid & Ahmed, 2024).

ESG ratings, another keyword in Cluster 4, provide an overview of a company's overall ESG performance (Raghavendra & Ting, 2023). However, ESG ratings are not universal, and there are concerns over divergence in ESG ratings for different enterprises due to the usage of different indicators and weights for aggregation (Neisen et al., 2022; Ozkan et al., 2023). Ambiguity exists regarding the factors that need to be included in ESG ratings (Edmans, 2023).

With reference to Cluster 5, a literature review of the related publications in this study's dataset highlights that a common approach adopted by rating agencies to assess enterprises' sustainability goals takes into consideration three overarching pillars: environmental, social, and governance (Ozkan et al., 2023), with SMEs playing a critical role in sustainable development. For instance, it was found that SMEs in Saudi Arabia act as key drivers of sustainable development by promoting ESG practices, highlighting their strategic role in advancing sustainability structures (Hamid & Ahmed, 2024).

In relation to Cluster 6, as SMEs co-exist in an ecosystem involving a larger community and environment, digitalization and sustainability have become significant trends for SMEs in recent years, opening up novel opportunities for SMEs to improve their operations, minimize their environmental footprint, and promote social well-being (Sklavos et al., 2024). Nonetheless, SMEs should strive to learn from other enterprises through practices such as benchmarking to strive for further continuous improvement.

For Cluster 7's keywords, a review of the publications in the dataset led to the discovery that the concept of green finance is gaining prominence (Neisen et al., 2022). Green finance refers to the financing of investments for projects that align with environmental protection in the governments' fight against climate change (Wang et al., 2021). Research has found that there has been a global shift toward sustainable finance in efforts to align finance with ESG (Kato et al., 2024). Bak et al. (2022) asserted that the financial market's role in supporting sustainability in an enterprise's business model is growing and taking on greater importance. According to Kato et al.'s (2024) study, access to sustainable finance, together with supportive policies and government initiatives, was crucial in improving the sustainability outcomes of SMEs, resulting in significant business growth and productivity.

The CSR keyword in Cluster 8 implies that SMEs with active involvement in activities such as community development projects foster community resilience by building strong connections with local communities, further cementing trust with stakeholders, and resulting in a positive public image (Hamid & Ahmed, 2024). Furthermore, Bollazzi and Risalvato (2018) reiterate that corporate responsibility can lead to value creation related to both tangible and intangible assets. However, many entrepreneurs still perceive that larger enterprises should play a primary role in CSR because of better resources, such as capital and manpower (Bjelic et al., 2025). In the SME sector, CSR and ESG factors were found to be key components of enterprises' BMs (Bak et al., 2022).

With reference to Cluster 9, some SMEs listed in Hong Kong Stock Exchange were not motivated to perform ESG reporting due to the perception that profitability remained the main objective and ESG reporting was not a part of their core business, leading to greenwashing practices as stated by Yip et al., (2024), Additionally, reluctance arose due to added cost and administrative burden. The same study revealed that management support and regulations are two key motivational factors in SMEs' ESG reporting.

The keywords in Cluster 10 indicate that the transition to sustainability requires a change in SMEs' business models (Bak et al., 2022; Jones et al., 2023). According to Bak et al. (2022), sustainable business models need to consider the role of non-financial factors (ESG) in building sustainable value as a response to the need to adapt enterprises to the challenges of sustainability. Bak et al. (2022) find a moderately significant correlation between ESG factors and enterprises' business models, with an emphasis on environmental factors. However, sustainable business models could differ according to the environmental conditions of specific countries in relation to climate change (Jones et al., 2023).

In this regard, strategic performance management (SPM) is a crucial factor in enabling the successful transition of SMEs to a green transition toward sustainable business practices and a resource-efficient circular economy (Jones et al., 2023). Furthermore, strategic management accounting (SMA) can be integrated into SPM to achieve increased operational efficiency and long-run cost reduction (Jones et al., 2023). They further added that an SMA framework could enhance the understanding of environmental and social costs pertaining to matters, such as waste treatment, environmental management, material processing, health and safety, and the importance of staff training. Finally, the keywords in Cluster 11 indicate that small and microbusinesses, not only big enterprises, are progressing toward net-zero adoption.

Disparate themes could arise due to the existence of different reporting guidelines and templates for ESG reporting by different bodies. Currently, most countries require SMEs to engage in voluntary ESG disclosures. The lack of standardization may pose a problem for comparisons in terms of performance measurements across different enterprises, industries, and countries. Additionally, the publication countries suggested that sustainability and ESG are more trending in Western countries but are gradually becoming more prominent in Asian countries.

This study indicates that ESG reporting is prevalent among SMEs in both developed and developing countries. The landscape of ESG reporting is continuously shaping SMEs' future (Setyaningsih et al., 2024). Although ESG is often used as a marketing tool, studies have found that ESG criteria are positively correlated with corporate financial performance (Friede et al., 2015; Nurlanovich, 2025). The benefits of ESG reporting are multifold. Studies have found that ESG reporting can have a positive impact on various aspects such as enterprise resilience (Nurlanovich, 2025), intellectual capital capacity (Reboredo & Sowaity, 2022) and competitiveness (Mohammad & Wasiuzzaman, 2021).

Despite increasing attention, the implementation of ESG and sustainability reporting can benefit from further improvements. The first is legal and policy reform. By providing clear and standardized policies in line with global expectations, a country's government and policymakers can play an indispensable role in facilitating SMEs' sustainability reporting (Mohammad & Wasiuzzaman, 2021). For instance, governments can provide targeted training, role-playing exercises, and conferences for SMEs to share the benefits of ESG reporting (Setyaningsih et al., 2024)

According to Shari et al. (2024), the reasons for slow ESG reporting progress among SMESs include the absence of an ESG platform to provide tools and assistance in the form of advice and networking for SMEs, as well as the lack of existing ESG templates or checklists. To address these challenges, governments can ease the ESG reporting process by providing SMEs with templates and checklists customized to SMEs' size and operational needs (Hassan et al., 2023), or even by developing customized ESG frameworks catered to different organizational contexts and industry characteristics (Tsang et al., 2023).

In addition, the government can also establish an ESG support group platform that functions as a one-stop center for SMEs seeking to integrate sustainability into their operations. Networking, advisory services, and capacity building can facilitate knowledge exchange between entrepreneurs and other relevant organizations (Hassan et al., 2023). The government can also

provide recognition through awards and certifications to promote the adoption of ESG practices among SMEs.

The second aspect involves internal factors, namely, top management support (Cahyono et al., 2024; Nurlanovich, 2025). Top management with visionary leadership is critical in ensuring a smooth integration of ESG principles into SMEs' strategies and operations, implementation of innovative ESG practices, staff motivation, and creation of an organizational culture that supports sustainability (Cahyono et al., 2024). Ethical leadership has been found to result in higher employee retention (Nurlanovich, 2025), demonstrating the vital role that top management plays in cultivating a sustainable culture. The synergy between top management support and legal reforms significantly strengthens SMEs' capability to implement ESG reporting.

5. Conclusion and limitations

This report examines the trends in sustainability and ESG among SMEs. Twenty publications from Scopus were obtained for this study, resulting in a small sample size. This implies that publications related to SMEs' sustainability and ESG matters are relatively sparse in the Scopus database. Although the dataset used in this research is small, Scopus journals have an average acceptance rate of 32% (Elsevier Author Services, 2022), suggesting that their publications are generally of high quality and research impact.

This study reveals trends in ESG and sustainability reporting among SMEs. Based on the keyword occurrence frequency, most SMEs prioritize the environmental pillar the most, focusing on keywords such as carbon footprint, greenhouse effects, environmental health, and resource conservation, including solid and water waste management. This is followed by the social pillar encompassing keywords, such as CSR and human activities. In contrast, governance-related pillars appeared to be the least frequently occurring keywords. These keyword frequency patterns concur with the findings of Nurlanovich (2025). Nonetheless, there is a growing need for SMEs to strengthen the governance pillar for a more balanced ESG focus to achieve better organizational resilience. This is because the governance pillar pertaining to leadership, compliance, and risk management plays an equally important role for SMES advancing toward sustainability. Other important trends include growing emphasis on financial and economic sustainability. Sustainability and financial performance are double-edged swords that work in two ways. Profitability remains a real concern as it provides the necessary resources to finance effective sustainability practices. Conversely, robust sustainability reporting can lead to increased financial performance.

As awareness and knowledge about sustainability and ESG reporting surge, along with the possibility of mandatory ESG reporting for SMEs in the near future, this could be accompanied by a corresponding rise in their popularity as research topics. It is expected that the research areas in these related fields will continue to expand in line with these developments. To overcome the limitations of small datasets, future research in similar areas may utilize datasets from different databases to ensure a more thorough and balanced analysis. As the interest in SMEs' role in sustainability continues to increase in the future, the wider availability of related publications will enable a more rigorous and extensive analysis.

Acknowledgement: The authors wish to thank USM for providing the opportunity to attend the bibliometric analysis workshop.

Funding statement*:* This research received no specific grants from any funding agency in the public, commercial, or not-for-profit sectors.

Ethical compliance: This research did not require ethics approval because it did not involve human participation.

Data access statement: All publications used in this study are available in databases.

Conflict of interest declaration: The authors declare that they have no affiliations with or involvement in any organization or entity with any financial interests in the subject matter or materials discussed in this manuscript.

Author contributions: Leow contributed to the design and implementation of this research. Both Leow and Teh contributed to the analysis of the results and the writing of the manuscript.

REFERENCES

Akilah, F. (2024). ESG implementation in business: managing the sustainability goals in micro, small, and medium enterprises (MSMEs). *Sukuk: International Journal of Banking, Finance, Management and Business*, *3*(I), 55−67.

Bak, I., Ziolo, M., Cheba, K., & Spoz, A. (2022). Environmental, social and governance factors in companies' business models and the motives to incorporate them in the core business. *Journal of Business Economics and Management*, *23*(4), 837–855.

Bjelic, Z., Schmitt, C., Baldegger, R., & Bou Nader, R. (2025). Examining the impact of humane entrepreneurship on overall firm performance: an empirical investigation of SMEs. *Journal of the International Council for Small Business*, *6*(4), 579−592.

Bollazzi, F., & Risalvato, G. (2018). Corporate responsibility and ROA: Evidence from the Italian stock exchange. *Asian Economic and Financial Review*, *8*(4), 565–570.

Cahyono, P., Ramadhani, A. D., Rochmawati, I., Febriyanty, P., & Mas, K. (2024). Leadership and ESG-based innovation (Environmental, Social, Governance): implications for SME performance in the STAR-UP environment. *Journal of Contemporary Administration and Management (ADMAN)*, *2*(3), 591−599.

Donthu, N., Kumar, S., Mukherjee, D., Pandey, N., & Lim, W. M. (2021). How to conduct a bibliometric analysis: an overview and guidelines. *Journal of Business Research*, *133*, 285−296.

Edmans, A. (2023). The end of ESG. *Financial Manageme*nt*, 52*(1), 3–17.

Elsevier Author Services. (2022, March 9). *Journal acceptance rates: Everything you need to know* | Elsevier Author Services Blog. Elsevier Author Services - Articles; Elsevier. https://scientific-publishing.webshop.elsevier.com/publication-process/journal-acceptance-rates/

Friede, G., Busch, T., & Bassen, A. (2015). ESG and financial performance: aggregated evidence from more than 2000 empirical studies. *Journal of Sustainable Finance and* Investment, 5(4), 210–233.

Hamid, E. M., & Ahmed, D. E. E. (2024). Small and medium enterprises and their role in achieving sustainability: the case of Al-Ahsa Governorate, KSA. *AgBioForum*, *26*(2), 66–76.

Hassan, M. H. A., Shari, W., Wahab, N. A., Ezanee, A. A. M., & Wahab, N. M. A. (2023). Toward sustainable small and Medium Enterprises (SMEs): awareness and overcoming challenges. *Asia-Pacific Management Accounting Journal*, *18*(3), 165–197.

Hassan-Montero, Y., De-Moya-Anegón, F., & Guerrero-Bote, V. P. (2022). Vista de SCImago Graphica: a new tool for exploring and visually communicating data. *Profesional de La Información*, *35*(1), 1−12.

Jo, D., & Kwon, C. (2022). Structure of green supply chain management for sustainability of small and medium enterprises. *Sustainability (Switzerland*), 14(1), 50.

Jones, B., Rasha, A., Dyczkowska, J., & Dyczkowski, T. (2023). Sustainable performance management in the EU SME sector. A review and analysis of concepts and methods of strategic management accounting. *Zeszyty Teoretyczne Rachunkowosci, 47*(4), 191–215.

Joy-Camacho, W., & Thornhill, I. (2024). Opportunities and limitations to environmental management system (EMS) implementation in UK small and medium enterprises (SMEs) – A systematic review. *Journal of Environmental Management*, *367*, 121749.

Kato, A. I., Chiloane-Tsoka, E. G., & Mugambe, P. (2024). Unlocking the potential: the influence of sustainable finance solutions on the long-term sustainability of small and medium-sized enterprises. *Cogent Business and Management, 11*(1), 2391122.

Mohammad, W. M. W., & Wasiuzzaman, S. (2021). Environmental, Social and Governance (ESG) disclosure, competitive advantage and performance of firms in Malaysia. *Cleaner Environmental Systems*, *2*(January), 100015.

Neisen, M., Bruhn, B., & Lienland, D. (2022). ESG rating as input for a sustainability capital buffer. *Journal of Risk Management in Financial Institutions*, *15*(1), 72–84.

Nurlanovich, B. J. (2025). Social responsibility and ESG in SMEs for entrepreneurship growth: a systematic mapping study. In *BIO Web of Conferences* (Vol. 175, p. 06003). EDP Sciences.

Olanrewaju, O. I. K., Daramola, G. O., & Babayeju, O. A. (2024). Transforming business models with ESG integration: a strategic framework for financial professionals. *World Journal of Advanced Research and Reviews*, *22*(3), 554–563.

Ozkan, S., Romagnoli, S., & Rossi, P. (2023). A novel approach to rating SMEs' environmental performance: bridging the ESG gap. *Ecological Indicators, 157*(November), 111151.

Pérez, L., Hunt, V., Samandari, H., Nuttall, R., & Biniek, K. (2022). Does ESG really matter—and why. *McKinsey Quarterly, 60*(1), 1–9.

Pessin, V. Z., Yamane, L. H., & Siman, R. R. (2022). Smart bibliometrics: an integrated method of science mapping and bibliometric analysis. *Scientometrics, 127*(6), 3695–3718.

Pollman, E. (2024). The making and meaning of ESG. *Harvard Business Law Review, 14*, 403.

Qiu, K. (2024, September). Achieving sustainable development through ESG integration: a comprehensive analysis. In *2024 10th International Conference on Humanities and Social Science Research (ICHSSR 2024)* (pp. 116-122). Atlantis Press.

Raghavendra, R., & Ting, Y. (2023). Survey on ESG, investors, firms. *China Finance Review* International, 14(1), 3–33.

Reboredo, J. C., & Sowaity, S. M. A. (2022). Environmental, social, and governance information disclosure and intellectual capital efficiency in Jordanian listed firms. *Sustainability (Switzerland)*, *14*(1), 115.

Schotten, M., El Aisati, M., Meester, W. J. N., Steiginga, S., & Ross, C. A. (2017). A brief history of Scopus: The world's largest abstract and citation database of scientific literature. In *Research analytics* (pp. 31-58). Auerbach Publications.

Setyaningsih, S., Widjojo, R., & Kelle, P. (2024). Challenges and opportunities in sustainability reporting: a focus on small and medium enterprises (SMEs). *Cogent Business and* Management, 11(1), 2298215.

Shari, W., Hassan, M. H. A., Ezanee, A. A. M., Wahab, N. M. A., & Wahab, N. A. (2024). Ways to promote sustainable practices among Malaysian SMEs from the viewpoints of experts. *Journal of Asian Scientific Research, 14*(4), 597–611.

Singh, V. K., Singh, P., Karmakar, M., Leta, J., & Mayr, P. (2021). The journal coverage of Web of Science, Scopus and Dimensions: a comparative analysis. *Scientometrics, 126*(6), 5113–5142.

Sklavos, G., Theodossiou, G., Papanikolaou, Z., Karelakis, C., & Themistokles, L. (2024). Investing the impact and the challenges of digital transformation and green entrepreneurship in Greek food industry. *Intellectual Economics*, *18*(2), 360–383.

Tsang, Y. P., Fan, Y., & Feng, Z. P. (2023). Bridging the gap: Building environmental, social and governance capabilities in small and medium logistics companies. *Journal of Environmental Management*, *338*(March), 117758.

United Nations. (2024, August 29). *The Sustainable Development Agenda*. United Nations Sustainable Development; United Nations. https://www.un.org/sustainabledevelopment/development-agenda/

Urata, S., Kuroda, K., & Tonegawa, Y. (2023). *Sustainable development disciplines for humanity: Breaking down the 5Ps—People, Planet, Prosperity, Peace, and Partnerships*. Springer Nature.

Van Eck, N. J., & Waltman, L. (2022). *Manual VOSviewer*. Leiden: Univeristeit Leiden.

Wang, X., Huang, J., Xiang, Z., & Huang, J. (2021). Nexus between green finance, energy efficiency, and carbon emission: Covid-19 implications from BRICS Countries. *Frontiers in Energy Research*, *9*(December), 1–11.

World Commission on Environment and Development. (1987). *Our common future*. Oxford University Press.

Yip, A. W. H., Yu, W. Y. P., & Ip, Q. W. T. (2024). Motivating small and medium-sized listed companies for better Environmental, Social and Governance (ESG) reporting in Hong Kong. *Public Administration and Policy*, *27*(2), 220–234.