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# Bibliometric Analysis of Sustainability Reporting Assurance: A Comprehensive Review of Global Research Trends and Emerging Topics

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## Abstract

*This paper analyses the intellectual structure of research on the audit and assurance of extra-financial reports, with the dual objective of mapping the intellectual structure of the field and identifying avenues for further inquiry. Employing bibliometric techniques and co-word analysis on data extracted from the Scopus database, the study maps the field's evolution from 2010 to the present. The findings reveal a thematic shift toward regulatory compliance, audit quality, and integrated reporting, reflecting a growing global demand for accountability. However, the analysis uncovers a significant geographical and institutional bias: the current literature is heavily dominated by Western contexts, with a marked underrepresentation of Africa and the Arab world. This limitation hinders the development of inclusive theoretical models capable of addressing the challenges of emerging markets. The study's contribution lies in identifying the need to investigate audit firm constraints in contexts where sustainability standards are still in a developmental phase, such as Tunisia. By highlighting these neglected areas, the research provides a strategic agenda for scholars and policymakers to design governance frameworks that are effective across diverse regulatory environments.*

**Cuvinte cheie:** sustainability reporting assurance; bibliometric analysis; performance analysis; science mapping; co-word analysis;

**Clasificarea JEL:** M42, C80, Q56

### Vă rugăm să citați acest articol astfel:

Lajmi, A., Tounsi, I. (2026), Bibliometric Analysis of Sustainability Reporting Assurance: A Comprehensive Review of Global Research Trends and Emerging Topics, *Audit Financiar*, vol. XXIV, no. 2(182)/2026, pp.408-425, DOI: 10.20869/AUDITF/2026/182/015

### Link permanent pentru acest document:

<http://dx.doi.org/10.20869/AUDITF/2026/182/015>

Received: 26.11.2025

Revised: 25.12.2025

Accepted: 26.03.2026

## 1. Introduction

The assurance of sustainability reports has evolved from a niche voluntary practice into a critical area of scientific inquiry and corporate governance. As stakeholders, ranging from investors to regulatory bodies, increasingly demand "investor-grade" environmental, social, and governance (ESG) data, the role of external assurance in validating this information has become paramount. This shift has precipitated a surge in academic research exploring diverse themes, such as audit methodologies, the credibility of non-financial disclosures, and the impact of assurance on firm value. However, as the volume of literature expands exponentially, the field risks becoming fragmented, with isolated studies offering deep insights into specific jurisdictions while lacking a cohesive global perspective.

Despite the growing importance of this domain, systematic assessments of its intellectual structure remain scarce. Existing reviews often rely on qualitative methods, which, while valuable, can be limited by subjective interpretation and a narrow scope of selected papers. Furthermore, the current body of knowledge is heavily skewed toward developed economies, principally Europe, North America, and Australia. This geographic concentration obscures the unique challenges faced by auditors in emerging markets, particularly in the Arab world and African continent, where regulatory frameworks for sustainability are still in a developmental phase. Understanding these regional disparities is not merely an academic exercise; it is essential for developing inclusive theoretical models that reflect the global reality of audit practices.

This paper addresses these limitations by employing a comprehensive bibliometric analysis to map the evolution of sustainability reporting assurance. Unlike traditional literature reviews, bibliometric analysis offers a quantitative, objective means to synthesize large volumes of data, revealing structural patterns, influential networks, and thematic shifts that may not be immediately apparent through qualitative reading (Zupic and Čater, 2015). By utilizing the Scopus database and advanced science mapping techniques, this study aims to firstly, visualize the conceptual structure of the field, then, identify the migration of research topics from voluntary disclosure to mandatory compliance, and finally pinpoint critical geographical and thematic gaps that require urgent scholarly attention.

The originality of this research is twofold. First, it provides the first bibliometric mapping that explicitly contrasts the well-established Western discourse with the nascent

research emerging from developing contexts. Second, it responds to the specific calls by Habib (2022) for increased bibliometric inquiry in accounting, and by Ding *et al.* (2001) for mapping the conceptual boundaries of disciplines. By identifying the disconnection between global theoretical models and local audit realities in emerging markets, this study offers a strategic roadmap for researchers seeking to position their work in high-impact areas and for policymakers striving to harmonize global assurance standards.

This paper is organized as follows: Section 2 presents the theoretical background and reviews prior relevant studies. Section 3 outlines the bibliometric methodology and data selection process. Section 4 reports the results of the performance analysis and science mapping. Finally, Section 5 discusses the implications, acknowledges limitations, and proposes a future research agenda.

## 2. Theoretical background

The academic literature on sustainability reports has undergone a significant transformation over the past two decades, evolving from a niche interest into a mainstream accounting discipline. Early studies primarily focused on the technical and normative aspects of the field, with researchers such as Farooq and de Villiers (2017) examining the diverse standards and methodologies employed to audit extra-financial information. As the practice matured, the thematic focus broadened to encompass the strategic implications of assurance, exploring how verification mechanisms influence stakeholder perception and corporate value. In this context, studies began to position auditors not merely as verifiers of data but as critical agents of legitimacy; for instance, Handoko *et al.* (2020) demonstrated how external assurance serves to bolster a company's responsible image and secure reputational capital in an increasingly competitive global market. More recently, the proliferation of regulatory frameworks has introduced a new dimension to the literature, shifting attention from voluntary adoption to mandatory compliance. This trend is exemplified by recent works, such as that of Legenzova and Raudoniene (2025), which investigate the complexities arising from the European Union's directive imposing mandatory audits for sustainability reports. Despite this rich accumulation of empirical studies, efforts to systematically map the field's intellectual terrain remain fragmented. While recent reviews, such as that by Oware and Moulya (2023), have synthesized findings on specific sub-topics, there remains a paucity of comprehensive

bibliometric analyses that capture the global structural evolution of the discipline. This gap is particularly acute regarding the visualization of cross-jurisdictional trends and the identification of under-represented regions, highlighting the urgent necessity for a quantitative, network-based approach to decipher the complex interactions between emerging thematic clusters and the geographic distribution of knowledge.

### 3. Research methodology

Bibliometric research has been widely used for a variety of purposes (Kiliç and Uyar, 2022), including mapping the

thematic and conceptual structure of a research field (Ding *et al.*, 2001) and providing deeper insight into future research trends (Faraji *et al.*, 2022). As part of this bibliometric study of sustainability reports and their audits, a literature search of the Scopus database was adopted (Chadegani *et al.*, 2013).

To address the research objectives, this study adopts a systematic bibliometric workflow that aligns specific bibliometric techniques with targeted research questions to ensure robust results. **Table no. 1** details this methodological framework.

Table no. 1. Research model		
Objectives	Research questions	Methodological Approach
Study the latest scientific developments in auditing sustainability reports	How is the scholarly community structured in terms of influential authors, high-impact journals, and geographic distribution?	Performance Analysis: Citation metrics, H-index, and production volume analysis using <i>Biblioshiny</i> .
Identify Networks & Themes	What are the dominant conceptual clusters in sustainability assurance, and how have these themes evolved from voluntary reporting to regulated compliance?	Science Mapping: Co-word analysis and network visualization using <i>VOSviewer</i> .
Gap Analysis & Future Agenda	What specific institutional and regional gaps exist that hinder a global understanding of audit practices?	Qualitative Synthesis: Critical content analysis of under-represented clusters and recent debate.

Source: own projection

#### 3.1. Data collection

Following previous research (Ecim and Maroun, 2022), we used the Scopus database to extract documents related to the audit of sustainability reports as it covers different disciplines and high-quality journals. Scopus was selected over Web of Science due to its broader coverage of Social Sciences and business-related journals, which allows for a more comprehensive mapping of the accounting and business literature (Mongeon and Paul-Hus, 2016).

To ensure data homogeneity and analytical rigor, we constructed a search string that intersects two conceptual domains: the subject matter (employing terms such as "non-financial reporting," "ESG," and "CSR") and the assurance function (employing terms such as "audit" and "assurance"). This combination was designed to capture the full evolutionary arc of the field, ensuring the inclusion of both early voluntary disclosure studies and recent

mandatory compliance research. The search, conducted in March 2025, yielded an initial dataset of 505 documents based on the specific query detailed in **Figure no. 1**. To strictly maintain data homogeneity and ensure the reliability of the trend analysis, several filters were applied. We limited the scope to peer-reviewed "Articles" in English within the "Business, Management, and Accounting" and "Economics" subject areas. Crucially, we excluded 14 documents published in the current incomplete year (2025) to avoid time-lag bias in the annual growth calculations. This rigorous filtering process resulted in a final homogeneous sample of 491 documents (spanning 2000–2024) for the bibliometric analysis.

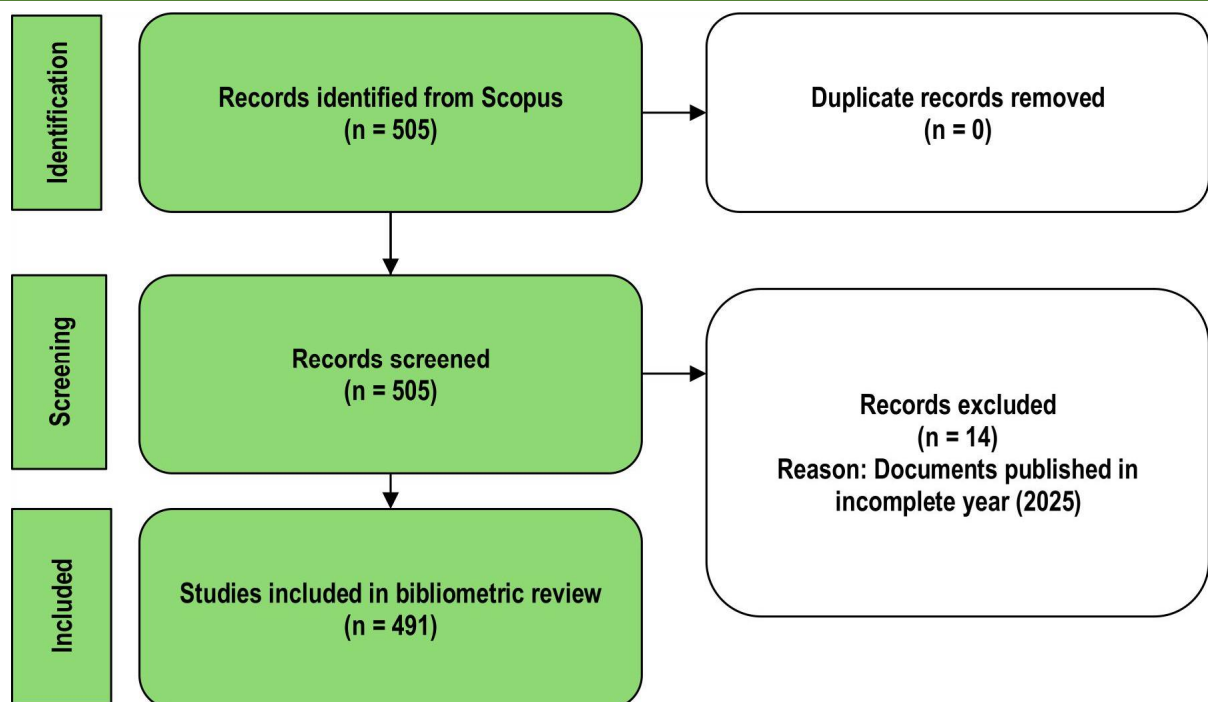
The systematic selection process, detailing the initial identification and the subsequent exclusion of incomplete data, is illustrated in the PRISMA flow diagram (**Figure no. 2**).

**Figure no. 1. Advanced query in Scopus**

TITLE-ABS-KEY ("non-financial reporting" OR "ESG reporting" OR "sustainability reporting" OR "extra-financial disclosure" OR "CSR reporting" OR "CSR disclosures" OR "ESG disclosure" OR "non-financial information" OR "sustainability reporting" ) AND TITLE-ABS-KEY ( "Audit" OR "Assurance" OR "auditor\*" OR "Audit firms" OR "sustainability reporting assurance" ) AND ( LIMIT-TO ( PUBSTAGE , "final" ) ) AND ( LIMIT-TO ( SUBJAREA , "BUSI" ) OR LIMIT-TO ( SUBJAREA , "ECON" ) ) AND ( LIMIT-TO ( DOCTYPE , "ar" ) ) AND ( LIMIT-TO ( LANGUAGE , "English" ) ).

Source: own projection

**Figure no. 2. Prisma flow diagram**



Source: own projection

### 3.2. Database analysis

The first search was carried out on 8 March 2025. 491 articles were selected from the Scopus database. A total of 491 documents were analysed using Bibliometrix software, version 4.4.3, and its Biblioshiny function. This enabled bibliometric analysis to be carried out by identifying the authors, journals and frequently cited references. In addition, the use of Bibliometrix made it possible to identify the main players and influencers in the research field, based on quantitative measurements, publication trends and citation patterns (Alkathiri *et al.*, 2024). Second, to visualize the intellectual structure and

thematic evolution of the field, we employed VOSviewer (version 1.6.20). To enhance the replicability of the network analysis, specific technical parameters were applied: we utilized the full counting method to assign equal weight to co-occurrences and established a minimum threshold of 5 for keyword frequency. This threshold was selected to filter out marginal terms and reduce noise, ensuring that the visualized clusters represent significant and recurring research themes within the literature.

**Table no. 2** presents the general bibliometric information for this database. The documents studied were published

between 2000 and 2024 in 201 sources, including journals and books. The database includes a total of 491 documents, with an average annual growth rate of

20.16%. In addition, the database includes a total of 26,895 bibliographic references and 1,086 keywords defined by the authors.

**Table no. 2. Metric data**

Description	Results
Timespan	2000 : 2024
Sources (Journals, Books, etc.)	201
Documents	491
Annual Growth Rate %	20.16
Document Average Age	5.2
Average citations per doc	45.63
References	26895
DOCUMENT CONTENTS	
Keywords Plus (ID)	247
Author's Keywords (DE)	1086
AUTHORS	
Authors	1086
Authors of single-authored docs	53
AUTHORS COLLABORATION	
Single-authored docs	58
Co-Authors per Doc	2.84
International co-authorships %	31.57

Source: own projection

In addition, the analysis highlights an average of 2.84 co-authors per document, underlining an international collaborative dynamic, with 31.57% of documents resulting from international collaborations.

## 4. Results of bibliometric analysis

### 4.1. Metrics and scientific production: performance analysis

Performance analysis examines the contributions of different research components to a specific field of knowledge (Cobo *et al.*, 2011). A wide range of indicators is commonly employed for this purpose, among which the most frequently used are the number of publications and citations per year or per author. The number of publications is generally interpreted as a proxy for scientific productivity, while citation counts reflect scholarly

impact and influence. Composite indicators, such as citations per publication and the h-index, combine both dimensions and are widely used to assess the performance of journals, authors, or institutions (Donthu *et al.*, 2021). Additional indices, including the m-index and the g-index, further refine this evaluation.

In this context, the number of published articles represents an indicator of scientific production, whereas the number of citations reflects the impact of this production on the advancement of knowledge within the field (Tiberius and Weyland, 2022).

#### 4.1.1. Publication trends

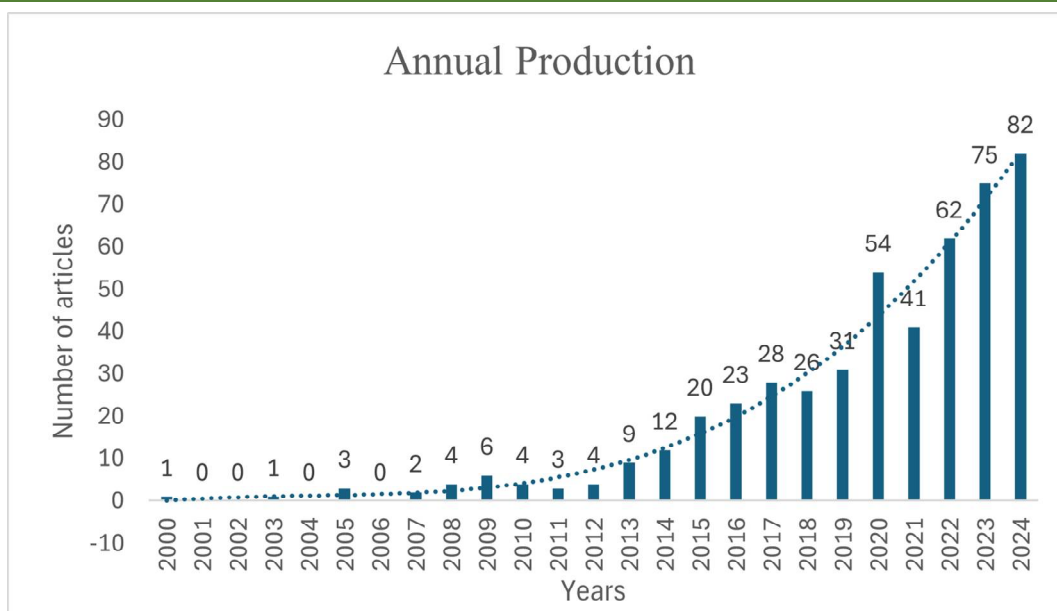
Figure no. 3 illustrates the annual evolution of scientific output between 2000 and 2024. The results reveal a significant upward trend, with an estimated annual growth rate of approximately 20.16%. This evolution can be divided into three distinct phases. Before 2010, scientific

production remained marginal, rarely exceeding five articles per year. This period corresponds to the early stage of sustainability reporting research, when disclosure practices were largely voluntary and confined to a limited academic niche.

From 2015 onwards, a clear acceleration in publication activity is observed, with output exceeding 15 articles per year. This shift correlates with the institutionalization of the field, driven by the introduction of integrated reporting frameworks (IIRC) and early discussions on European directives.

The most substantial increase occurred after 2020, peaking at over 80 articles in 2024. While Demers et al. (2020) attribute part of this surge to the COVID-19 pandemic, where researchers investigated ESG as a resilience factor, our analysis suggests a structural driver: the transition from voluntary disclosure to mandatory assurance. The proliferation of regulations, such as the EU's CSRD and the formation of the ISSB, has forced the academic community to pivot from normative discussions to technical investigations of audit quality and compliance.

**Figure no. 3. Articles annual production**



Source: own projection

#### 4.1.2. Average number of article citations per year

As with the number of publications, the average number of citations per paper initially increased, as shown in **Figure no. 4**. A notable peak in citations was recorded in 2013, with each paper being cited an average of 15.8 times.

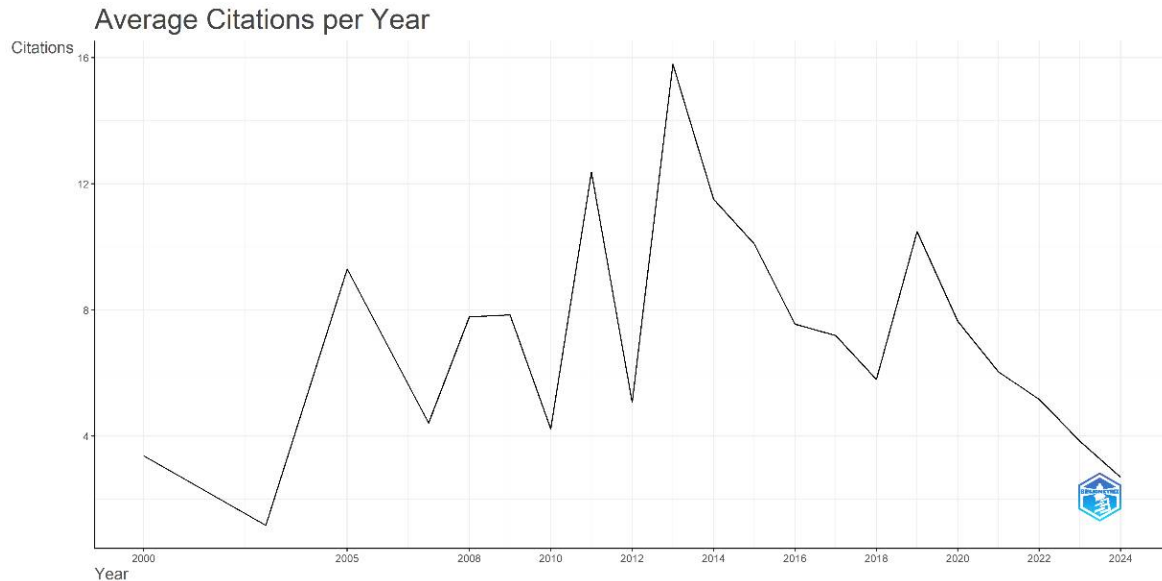
In more recent years, however, the average number of citations per paper has fallen, despite the increase in the number of publications (see **Figure no. 4**). This decline can be attributed to several factors, including an increase in the volume of research, which can lead to a dispersion of citations, resulting in a dilution effect whereby individual articles receive fewer citations on average. In addition, recent publications may not yet have had the time to

accumulate citations, as the impact of citations tends to increase over time.

#### 4.1.3. Literature sources

**Table no. 3** identifies the most relevant sources that have published work, based on the number of publications focusing on extra-financial reporting and auditing. The Corporate Social Responsibility and Environmental and Management, Sustainability Accounting Management and Policy Journal stands out as the most significant source, with 28 and 27 estimated publications respectively, representing the most substantial contribution in the dataset examined.

**Figure no. 4. Average number of citations per year**



Source: own projection

**Table no. 3. The 10 most relevant sources**

Sources	Articles
Corporate Social Responsibility and Environmental Management	28
Sustainability Accounting, Management and Policy Journal	27
Journal of Business Ethics	21
Business Strategy and The Environment	16
Journal of Cleaner Production	15
Meditari Accountancy Research	14
Managerial Auditing Journal	13
Social Responsibility Journal	12
Journal of Applied Accounting Research	10
Cogent Business and Management	9

Source: own projection

The Journal of Business Ethics ranks third with approximately 21 publications (4.3%), followed by Business Strategy and the Environment and the Journal of Cleaner Production which rank fourth and fifth, with 16 (3.2%) and 15 articles (3.1%) respectively. It should be noted that 33.6% of the 491 articles examined were published in the top ten journals on the list.

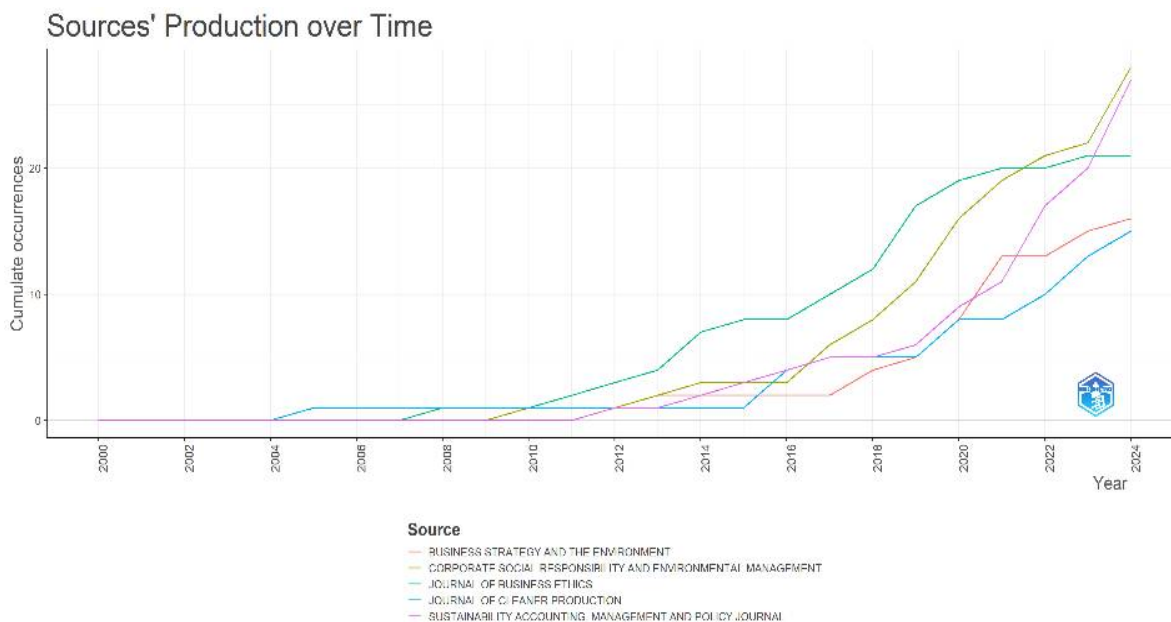
In addition, **Figure no. 5** illustrates the trend in the production of sustainability research articles in five specialist journals between 2000 and 2024. It should be

noted that during the period 2000-2012, the number of publications was relatively low, with journals such as the Journal of Business Ethics and Business Strategy and the Environment publishing fewer than five articles each. There was a gradual increase in output between 2013 and 2020, led by the Journal of Cleaner Production, with around 10 articles published, and Corporate Social Responsibility and Environmental Management, with around 8 articles. From 2021 onwards, there will be a significant increase in output, with the Sustainability

Accounting, Management and Policy Journal becoming the main source of information, with around 20 publications between 2021 and 2024, representing around 33% of the total output tracked. Business Strategy and the Environment and Journal of Cleaner Production will publish between 15 and 18 articles respectively. Newer

journals began contributing after 2020, reflecting a broader academic interest in sustainability. These trends suggest that institutions and researchers are paying increasing attention to integrating sustainability and extra-financial reporting into their studies.

**Figure no. 5. Trends in scientific output in journals time**



Source: own projection

In addition, the data reflects the dynamics of global research and how it is distributed across regions, highlighting the main centers of knowledge and the geographical diversity of academic contributions.

#### 4.1.4. Bradford's Law

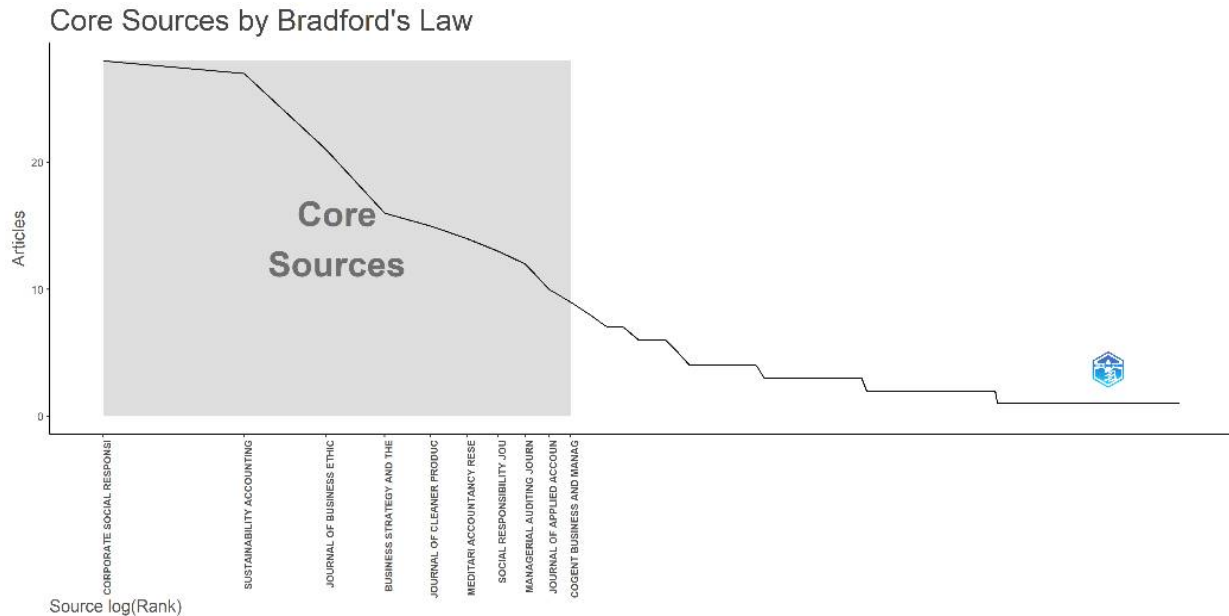
Bradford's law, introduced by Samuel C. Bradford in 1934, describes the unequal distribution of scientific articles in academic journals. This law highlights the fact that a small number of 'core' journals publish a significant proportion of articles in each field, while the majority of the remainder are scattered across a network of less active journals (Naranan, 1970). Bradford's law has made it possible to identify the journals that form the central core of a theme, occupying around a third of publications (Ben Said *et al.*, 2024). In this study's sample of 201 journals, only 10 belong to zone 1 (see **Figure no. 6**), which corresponds to the journals that are published most frequently on the

subject. These ten journals published a total of 165 articles out of a sample of 491 articles, illustrating a significant concentration of scientific production and representing most of the high-impact research. The three most influential journals in this field are: Corporate Social Responsibility and Environmental Management, Sustainability Accounting, Management and Policy Journal and Journal of Business Ethics.

#### 4.1.5. Sources' local impact

Analysis of the local impact of sources makes it possible to determine the most influential sources within the corpus selected. Unlike the analysis of the most relevant sources, which ranks journals according to the number of publications, this measure assesses the qualitative impact of sources by considering indicators based on citations. These indicators include the local h-index, the g-index and the m-index, defined in the previous section.

Figure no. 6. Bradford's law



Source: own projection

Table no. 4 shows the classification of journals according to the h-index. This index summarizes two distinct but complementary aspects of the journal: the number of articles, reflecting quantity, and the impact or citations of these articles, reflecting quality, (Chadegani *et al.*, 2013). The Journal of Business Ethics stands out in first place in terms of h-index (21), attributable to the significant breadth

of dissemination of its publications in terms of citations. In second place, the Corporate Social Responsibility and Environmental Management Journal also stands out, with an h-index of 20. The Sustainability Accounting, Management and Policy Journal came third with a h-index of 18.

Table no. 4. Top 10 most productive sources ranked by h-index

Source	h_index	Total Citations	Number of items
Journal of Business Ethics	21	3676	21
Corporate Social Responsibility and Environmental Management	20	1727	28
Sustainability Accounting, Management and Policy Journal	18	1003	27
Business Strategy and The Environment	15	1681	16
Journal of Cleaner Production	10	1066	15
Social Responsibility Journal	10	870	13
Journal of Applied Accounting Research	9	445	10
Meditari Accountancy Research	8	228	14
Accounting, Auditing and Accountability Journal	7	296	8

Source: own projection

**4.1.6. The most relevant authors and their impact**

The analysis of the most relevant authors (**Table no. 5**) indicates that Uyar A (12), Kuzey C (11) and Karaman AS (10) have the largest number of publications. However, their split score, which evaluates the relative contribution of an author by considering the total number of co-authors (Bu *et al.*, 2020), suggests that their individual impact on these publications is split between several co-authors.

**Table no. 5** also presents the ten most productive authors. In this context, productivity is evaluated in terms of the number of citations and the h-index, a major indicator for assessing the impact and quality of scientific work (Diwan, and Amarayil Sreeraman, 2023). The most productive researchers in this field are Uyar A, Kuzey C, Martínez-Ferrero J, García-Sánchez I-M, Hussainey K, Karaman As, Al-Shaer H, Boiral O, Comfort D, De Villiers C. The author Boiral O was one of the first who contribute to this field, with his article "Sustainability reports as simulacra? A counter-account of A and A+ GRI reports" which examines "the extent to which sustainability reports can be seen as a simulacrum used to mask real sustainability issues and project an idealised view of how companies are doing" (Boiral, 2013). His article has been widely cited in subsequent studies on green accounting

and sustainability (519 citations), which explains the high number of citations for this author.

Analysis of the data presented in **Table no. 5** reveals a hierarchy of authors based on their h-index. Statistical analysis reveals that author Uyar A has the highest h-index, with a score of 8, supported by a body of 12 publications and an accumulation of 428 citations. With 256 citations, his paper, "Determinants of Sustainability Reporting and its Impact on Firm Value: Evidence from the Emerging Market of Turkey," investigated "factors influencing Global Reporting Initiative (GRI)-based sustainability reporting, adoption of assurance statements in sustainability reporting, and levels of implementation of sustainability reporting." (Kuzey and Uyar, 2017). This article was co-authored by Kuzey C, who comes next with an h-index of 7. In third place, Martínez-Ferrero J holds a total citation count of 403, with his article "Impact of Disclosure and Assurance Quality of Corporate Sustainability Reports on Access to Finance" receiving 125 citations. This article "investigates the impact of the quantity and quality of corporate social responsibility disclosure and external validation on capital constraints" (García-Sánchez *et al.*, 2017).

**Table no. 5. Classification of authors according to the h index**

Auteurs	h_index	Total Citations	Number of items	Year of publication	Articles fractionalized
Uyar A	8	428	12	2017	3,85
Kuzey C	7	417	11	2017	2,85
Martínez-Ferrero J	7	403	8	2017	3,08
García-Sánchez I-M	6	331	6	2018	2,42
Hussainey K	6	444	6	2016	2,08
Karaman As	6	161	10	2021	2,35
Al-Shaer H	5	465	5	2018	2,67
Boiral O	5	916	6	2013	2,75
Comfort D	5	83	6	2015	2,00
De Villiers C	5	211	5	2018	1,92

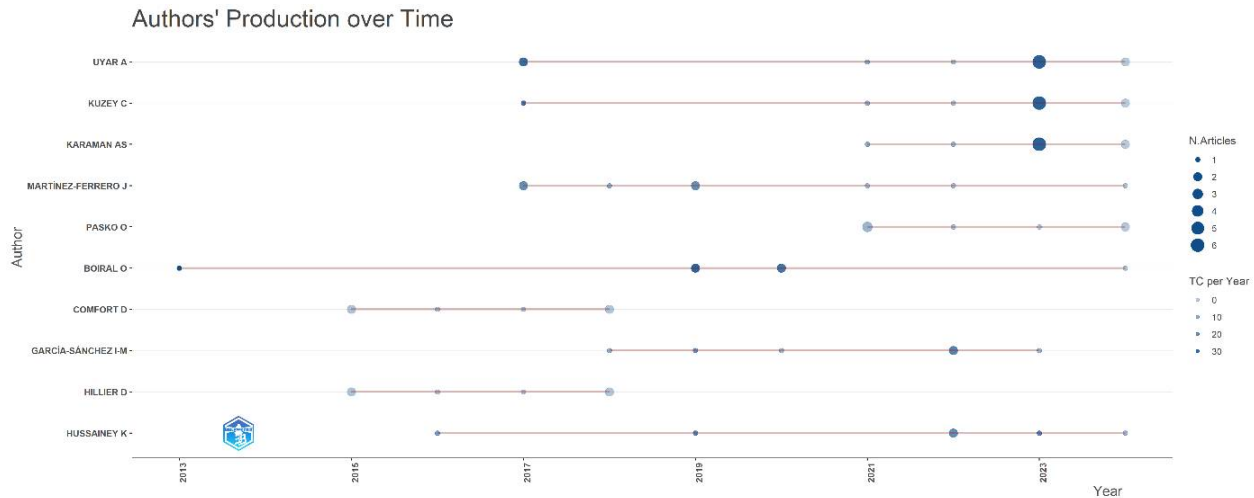
Source: own projection

**4.1.7. Authors' production over time**

**Figure no. 7** illustrates the evolution of authors' output over time. Over the years, several authors have emerged, with notable peaks in research output around 2021. Among the most productive authors, Uyar A., Kuzey C.

and Karaman AS show a significant increase in the number of articles published, particularly in recent years. The greatest concentration of publications appears between 2019 and 2023, when several authors have reached their production peak.

Figure no. 7. The most productive authors over time



Source: own projection

#### 4.1.8. Corresponding authors' countries

The analysis highlights a marked concentration of academic research on non-financial information in developed economies. Spanish and American researchers stand out with 38 articles each, representing 7.7% of the 491 total publications. This preponderance can be explained by the presence of cutting-edge research infrastructure in Spain and the United States, substantial institutional financial support and expertise rooted in the fields of sustainability (Altın and Yılmaz, 2023). British (7.1%) and Australian (6.5%) researchers are in second place, reflecting the significant influence of Anglo-Saxon and European academia in the development of global corporate transparency standards. In Europe, German (3.1%) and Italian (4.7%) researchers illustrate a regulatory-driven research landscape, stimulated by initiatives such as the European Union's Corporate Sustainability Reporting Directive (CSRD) and the Global Reporting Initiative (GRI), which encourage academic scrutiny of reporting mechanisms (Effah *et al.*, 2023).

Although emerging economies remain under-represented, researchers from China (5.3%) and Indonesia (3.9%) report a significant increase in ESG disclosure engagement in Asia, driven by global supply chain pressures and investor demands for accountability. South African researchers, with 2.4% of publications, are the only African contributors to the top 10, highlighting the challenges specific to their region, particularly in relation to resource governance and climate vulnerability. They are

thus in line with international agendas, such as the Sustainable Development Goals (SDGs) set by the UN.

However, a closer analysis of the data reveals a significant imbalance. The top ten nations account for 51.3% of total publications, a trend dominated by the developed economies. This disparity highlights the bias of the 'global North' in sustainable development research, which could lead to the marginalisation of local perspectives from emerging markets. For example, while European researchers focus on regulatory alignment, their counterparts in Indonesia or South Africa explore issues specific to national contexts (such as deforestation or social equity), which are under-represented in the dominant discourse. In addition, the preponderance of American and Australian researchers highlights the influence of voluntary market-oriented frameworks, such as the Task Force on Climate-related Financial Disclosures (TCFD), on research programmes. This dynamic contrasts with the regulatory rigour observed in Europe (Table no. 6).

The dominance of Western developed economies observed in our sample aligns with the findings of recent bibliometric reviews. Specifically, Oware and Moulya (2023), and Pasko *et al.* (2021) similarly identified a hegemony of US and European contexts in sustainability research. Pasko *et al.* (2021) notably identified 2011 as a "bifurcation point" marking the maturity of sustainability reporting, a trend mirrored in our data regarding assurance. However, a nuanced difference emerges in

our results: while previous studies found a broader distribution for general ESG reporting, our mapping reveals a sharper concentration of assurance-specific research in Europe (notably Spain, UK, Italy). This divergence is likely driven by the distinct regulatory landscape in Europe (e.g., the long-standing audit requirements of the NFRD), which has generated a specific demand for assurance research that is less pronounced in the purely market-driven US context.

**Table no. 6. Ranking of countries by affiliation of corresponding authors**

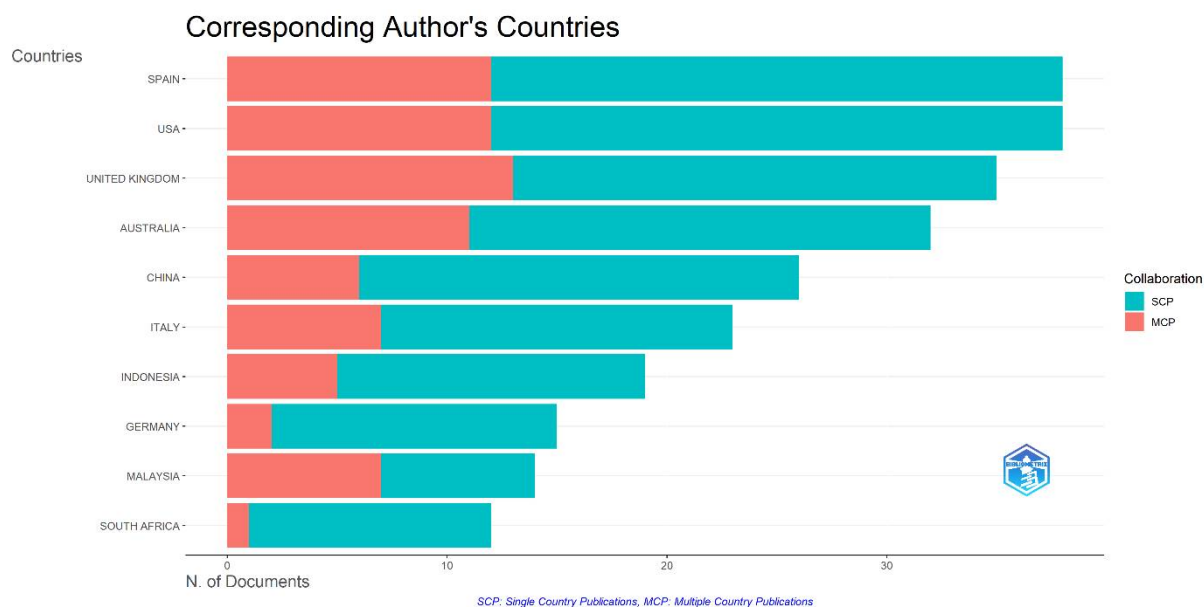
Country	Articles	Articles %
Spain	38	7.7
United States	38	7.7
United Kingdom	35	7.1
Australia	32	6.5
China	26	5.3
Italy	23	4.7
Indonesia	19	3.9
Germany	15	3.1
Malaysia	14	2.9
South Africa	12	2.4

Source: own projection

Figure no. 8 illustrates trends in collaboration between the countries of the corresponding authors, measured using publications from a single country (SCP, research involving only national authors) and publications from several countries (MCP, collaborations with international co-authors). While Spain and the United States maintain a balance between national (SCP) and cross-border (MCP) collaborations, Malaysia stands out with 50% of its publications involving multinational partnerships, the highest rate among the main contributors. This contrasts sharply with South Africa (8.3% of MCPs) and Germany (13.3% of MCPs), where research results remain largely anchored at national level. The UK (37.1% CPG) and Australia (34.4% CPG) also emphasize their propensity to establish global partnerships, in line with their close links with international university networks.

Collectively, these top 10 countries account for around half of all publications, reflecting a geographically diverse but unevenly collaborative research landscape. While Western countries dominate in terms of volume, the inclusion of Malaysia and South Africa highlights the growing participation of Asian and African regions. The data highlights a dichotomy in research priorities: some countries leverage international networks to amplify their reach, while others focus on localised outcomes, a dynamic that is shaping the global discourse on non-financial reporting.

**Figure no. 8. Authors collaboration from different countries**



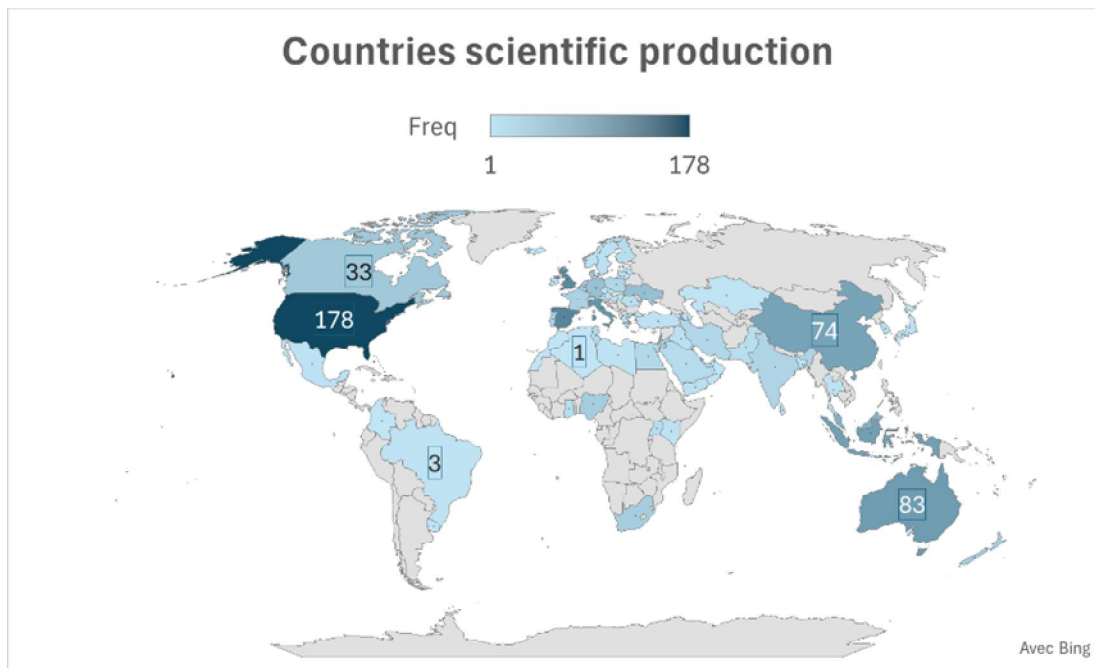
Source: own projection

#### 4.1.9 Countries' scientific production

**Figure no. 9** shows the distribution of scientific output by country. The United States leads the way with 178 publications, followed by Spain (108), the United Kingdom (104), Italy (91), Australia (83) and Indonesia (79). This trend highlights the preponderance of developed countries in research production, a phenomenon attributable to their

systemic advantages in terms of funding and infrastructure. The inclusion of Indonesia in this ranking reveals the gradual emergence of emerging economies in the concert of international scientific contributions. The data reveals a research landscape that is both progressive and evolving, characterized by increasing participation.

**Figure no. 9. Countries scientific production**



Source: own projection

## 4.2. Science mapping

### 4.2.1. Co-word analysis

Various bibliometric methods are used to quantitatively map the relationships between concepts, ideas and themes. To refine our study, we are going to use one of the most important methods, which is co-word analysis. By analysing a large number of research papers over several periods, co-word analysis provides a precise view of the evolution of a research field (Ding *et al.*, 2001). In addition, it improves the objectivity of traditional literature analysis approaches (Zupic and Cater, 2015).

The co-word analysis highlights a research environment characterized by its dynamism and interdisciplinarity, with a focus on the themes of sustainability, governance and

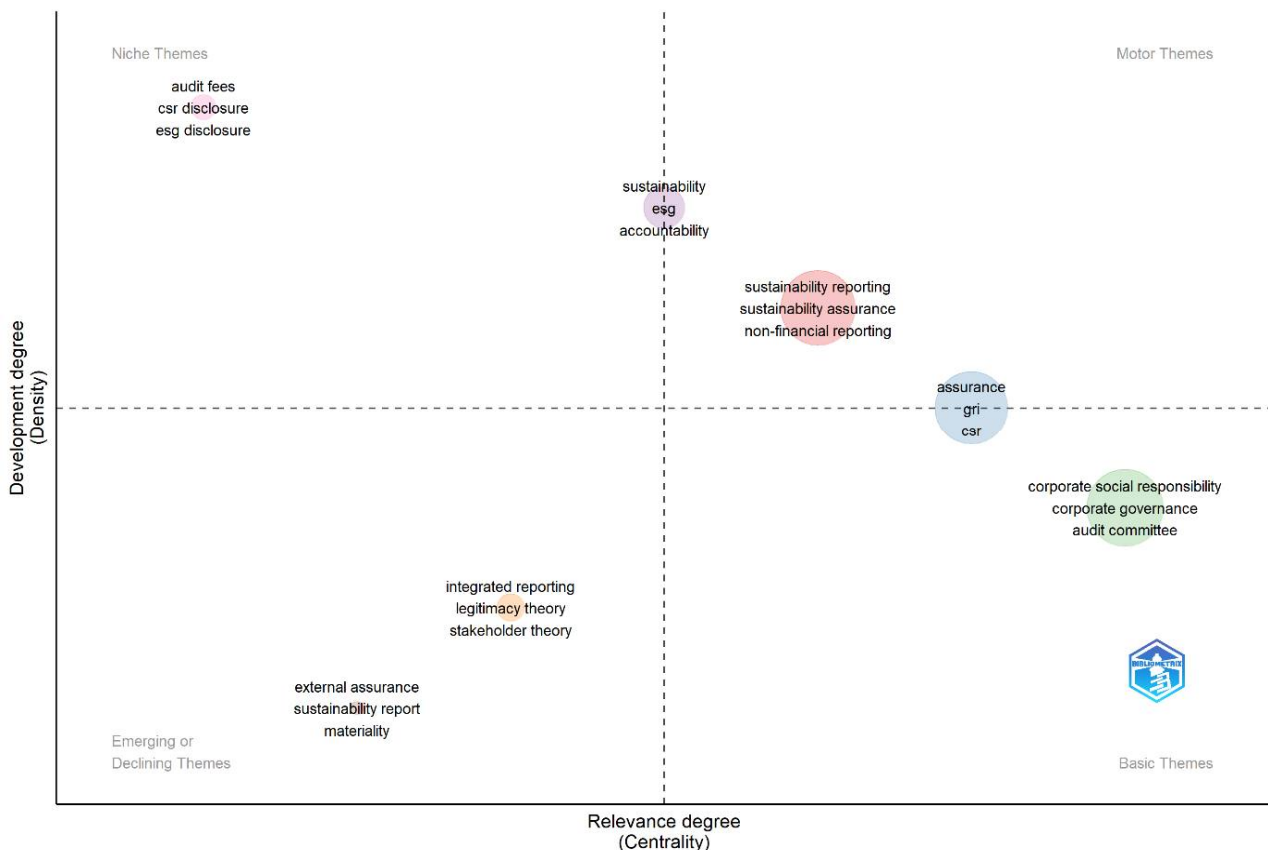
corporate responsibility. Within this landscape (**Figure no. 10**), 'sustainability reporting' (cluster 6) plays a central pivotal role, linking themes such as ESG integration (cluster 4), regulatory compliance (cluster 3) and CSR disclosure (cluster 2), reflecting its role as the linchpin of modern corporate transparency. The close links between 'corporate governance' (cluster 1) and 'CSR reporting' highlight the interaction between internal governance structures and external communication on sustainable development. The emergence of specific terms such as 'greenwashing' (cluster 8) and 'sustainability reporting assurance' highlights the increased importance attributed to ethical responsibility and verification, driven by regulatory frameworks such as European Directive 2014/95/EU. Furthermore, the spatial proximity of the Sustainable Development Goals (SDGs) and



accountability on the part of companies. At the same time, core topics such as corporate social responsibility (CSR), corporate governance and audit committees form a major pillar of the literature on sustainability reporting assurance. Although these topics are essential, they remain less studied in the specific context of sustainability audit practices. On the other hand, niche topics such as audit fees, CSR disclosure and ESG disclosure, although enriched, remain of lesser importance. This suggests that they provide specialist knowledge in specific sub-areas, do not exert a significant influence on the wider sustainability assurance debate. In addition, emerging or declining themes in the bottom left quadrant include concepts such as external assurance, materiality, legitimacy theory and stakeholder theory. These ideas have historically played a crucial role in justifying the increasing attention paid by companies and regulators to sustainability reporting. However, their current positioning

suggests that they are at a crossroads, either regaining relevance as sustainability reporting becomes more regulated, or losing ground to more standardized and compliance-focused approaches. The evolution of these themes points to a gradual institutionalization of sustainability assurance practices. Indeed, evolving regulatory frameworks is redefining expectations for non-financial reporting, and the role of audit firms in ensuring the reliability of sustainability information is becoming increasingly crucial. This poses new technical and organizational challenges for audit firms, and it is therefore essential to assess their readiness to integrate sustainability assurance into their service offering. By understanding their perspectives and readiness, we can not only gain valuable insights into the evolving audit landscape but also anticipate the key drivers and barriers to the adoption of sustainability assurance practices.

Figure no. 11. Thematic map



Source: own projection

An analysis of the literature in our sample reveals a constant diversity and evolution of approaches related to environmental, social and governance (ESG) issues, extra-financial reporting and their audit. In terms of empirical studies, quantitative analyses, and more specifically regression models, predominate in research that focuses on the influences of corporate governance structures, such as audit committees and board characteristics, on ESG information and company performance (Moussa *et al.*, 2024). In academic literature, theoretical frameworks such as legitimacy and stakeholder theory are frequently used to understand these relationships (Poulsen and Sigurjonsson, 2024). However, recent qualitative studies suggest that the effectiveness and credibility of assurance processes could be compromised, revealing a potential for managerial capture, greenwashing and a disconnect between reported information and actual impact (Hsueh, 2018). The emergence of mandatory sustainability reporting requirements and the application of artificial intelligence (AI) to ESG assurance are considered recent trends, which require further investigation of their implications (Pantazi, 2024; Li *et al.*, 2024). Our literature review reveals a trend towards a more integrated and strategic approach to sustainability reporting certification. This evolution is driven by changing market expectations and increasingly complex regulatory frameworks, which challenge traditional audit practices. By synthesising these themes, the review not only clarifies the current intellectual landscape but also highlights opportunities for future research to explore how audit firms can adapt to and advance this transformation.

#### *4.2.3. Future research directions*

Based on the structural gaps and thematic disconnects identified in our bibliometric mapping, we propose a comprehensive research agenda that explicitly links these empirical findings to critical avenues for future inquiry. First, our spatial analysis highlighted a significant hegemony of Western contexts, with a critical paucity of research emerging from the Arab world and North Africa. This geographic imbalance implies that existing theoretical frameworks, often rooted in developed institutional settings, may not fully capture the complexities of emerging markets. Consequently, future scholarship must prioritize the investigation of assurance adoption in transitional economies, such as Tunisia. Researchers should specifically examine how local audit firms navigate "institutional voids", such as fragmented regulations and

limited technical expertise and whether their motivations are driven by genuine ethical commitment or merely the pressure to signal legitimacy to foreign investors. Second, the thematic map revealed that topics such as "Audit Fees" and "Financial Performance" remain niche clusters with low centrality, suggesting that the tangible economic benefits of assurance are not yet clearly established in the literature. To address this, future studies should rigorously investigate the cost-benefit dynamics of assurance services, exploring whether high-quality assurance actually reduces the cost of capital in developing markets or if it simply represents a compliance cost without financial return. Finally, acknowledging that the field is currently dominated by quantitative regression analyses using archival data, we argue that a methodological shift is required to deepen our understanding of the field. We strongly recommend the adoption of mixed-method research designs that combine large-scale data analysis with qualitative inquiries, such as in-depth practitioner interviews. Such an integrated approach is essential to open the "black box" of the assurance process, allowing researchers to triangulate findings and better understand the behavioral and organizational nuances of auditors that statistical correlations alone cannot reveal.

## **5. Conclusions**

The primary objective of this study was to review the existing literature to identify key findings and define future research areas. By employing a quantitative bibliometric method, this study overcomes the subjective biases often associated with qualitative reviews (Zupic and Čater, 2015), offering an objective and global representation of the sustainability reporting assurance field. Our analysis reveals a significant resurgence of interest since the 2010s, with a thematic evolution from voluntary "CSR disclosure" to mandatory "regulatory compliance" and "audit quality." This shift reflects the global priority placed on transparency and accountability in ESG approaches. However, despite this growth, our findings highlight a critical geographical bias: the literature is heavily dominated by Western contexts, with minimal representation of Africa and the Arab world. The unique contribution of this research lies in identifying this gap as a major obstacle to the development of inclusive theoretical models. Specifically, we argue that the current literature fails to address the motivations and restrictions of audit firms in transitional economies, such as Tunisia, where sustainability standards are still in a developmental phase.

This insight offers practical relevance for policymakers in emerging markets, suggesting that governance frameworks must be adapted to local institutional contexts rather than simply importing global standards. Furthermore, utilizing science mapping methods (Donthu et al., 2021), we visualized the intellectual interactions within the field. The co-word analysis demonstrated that while topics like corporate governance are central, the link between assurance and financial performance remains

underexplored. These findings provide a strategic roadmap for future research. While this study is limited by its exclusive reliance on the Scopus database, it establishes a necessary foundation for the next phase of scholarship. Future research should aim to merge multiple databases and employ mixed-method designs to deeply investigate the operational challenges of assurance in under-researched emerging markets.

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