sustainability

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Review

Sustainability at the Intersection: A Bibliometric Analysis of the Impact of Social Movements on Environmental Activism from 1998 to 2025

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Abstract

Sustainability and environmental activism are two interconnected fields that advocate for a common goal: systemic changes to protect the environment. Grassroots movements play a crucial role in influencing the status quo, public discourse, and actions regarding these topics by shaping new policies and public behavior. The present study aims to conduct a comprehensive bibliometric review that explores the intersection of environmental activism and sustainability from the pioneering document on this subject from 1998 to 2025 by analyzing 475 documents retrieved from the ISI Web of Science (WoS) database. This study adopts a quantitative approach to identify trends, key authors, patterns, topics, and themes in environmental activism focused on sustainability. By tracking the research landscape from the seminal work, this research provides insights into sustainable environmental initiatives. Results underscore that sustainability cannot be viewed as an isolated concept. Instead, it has become a standard across multiple domains. Environmental activism has the potential to drive change toward a more sustainable future across all domains analyzed. There is an urgent need for initiatives and collaborations across disciplines to achieve this goal.

Keywords: social movements; environmental activism; sustainability; bibliometric review; VOSviewer; leader countries; themes; interdisciplinary research

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1. Introduction

The relationship between sustainability and environmental activism has grown in both scholarly research and international practice, with activism inspiring the development and adoption of sustainability concepts, influencing individual and corporate behaviors, and shaping broader societal transformations [1,2].

This bibliometric review synthesizes findings from significant studies to examine the development of environmental activism, assess its reach, and investigate how it has been incorporated into social sciences. The literature attests to a surge in research interest

that has occurred globally since 2010, driven by heightened environmental consciousness, digital mobilization, and a focus on sustainability centered on justice.

While much of the literature implicitly treats sustainability, environmental activism, and corporate social responsibility (CSR) as stable or clearly delineated categories, recent scholarship emphasizes the fluid and evolving nature of these constructs [3–5]. Over the past three decades, the concept of sustainability has undergone transformations, shifting from an ecological and conservationist paradigm to an integrative socio-economic and governance framework that includes ESG standards, stakeholder accountability, and SDG alignment [3,6–9]. Similarly, environmental activism has evolved from grassroots protest movements to encompass institutionalized, digital, and organizational forms of engagement, often embedded within corporate structures [9–11]. Activism today includes shareholder engagement, online mobilizations, and symbolic brand resistance—suggesting a plurality of tactics and arenas that challenge traditional dichotomies between activism and institutions. Moreover, the movement from CSR to Creating Shared Value (CSV) reflects a reconceptualization of corporate responsibility not merely as reputation management, but as an integral part of business strategy aimed at simultaneously achieving economic and societal value [3,12–15]. Scholars argue that this transition implies a need to assess dynamic stakeholder relationships, long-term impact models, and sustainability-oriented innovation [16–18]. In parallel, the emergence of the circular economy and bioeconomy has reframed sustainability as a systemic transformation process, emphasizing resource efficiency, innovation, and socio-economic integration [9,11,17,19]. These perspectives demonstrate that sustainability is not a static end goal, but a dynamic process shaped by institutional shifts, political pressures, technological developments, and evolving social values.

Scholars have long interpreted a period in the development of environmental advocacy as a shift from the streets to the networks of organizations, institutions, and companies, where they actively participate [20,21]. Consequently, an evolution in the understanding of the opportunity for adopting not only external pressure but also internal processes for generating change arose. Some authors give new life to the concept of activism as an internal organizational force and argue that employees and insiders are the ones who can lead the way to sustainability by means of their influence on corporate and institutional frameworks [22,23]. Their work is a signal for the rise in "organizational activism," where change is brought about not through coercion, but from a point of working within the organization.

Similarly, others point to the increasingly important place of climate justice and ecological citizenship in the public sphere, which reveals the growing spirit of citizenry and eco-consciousness [24]. These models, as the author emphasized, bring activism into the role of leading people to realize the need to implement environmental values and engage in sustainable behavior in their everyday lives and political activities.

The process of change is also a subject of study that provides the necessary background for understanding activism. Researchers have analyzed historical data to demonstrate the efforts of people to influence the politics of the time, recognizing the topics that the public was discussing [25,26]. These authors explain how the environmental problems that the USA has been facing have attracted the interest of the people through the use of rhetorical techniques, while they have also controlled the lawmaking, reacting to their ideas and backing movements to change the direction of the government.

Investigations across multiple areas, including but not limited to environmental science, sociology, economics, and education, have been exposing the complex and intricate nature of activism. In the scope of education, researchers have made the case for the inclusion of the issues of sustainability and activism in the teaching of various subjects as a tool to help students understand their responsibility from a critical mindset [23,27].

According to their research, incorporating the issues of environmental crisis and social justice into formal education not only makes students aware of the problems but also turns them into active participants in the educational and societal processes, as well as improves their level of community engagement [28,29].

The study of sociology provides additional understanding of the various aspects of environmental activism and explains them through different societal phenomena and facts. For a practical example, some explain activism as a reciprocal societal response to the combination of risks, unfairness, and ecological disparity [30]. They outline the role of activism as often being the result of the direct experience of the people who are most affected by these problems—those who are, in most cases, underprivileged and marginalized in society [31].

Furthermore, sociological research allows us to see activism from a different perspective; it is also a form of resistance to the existing structure of society and a means of reclaiming lost power from the rulers of the environmental system. In addition to this negative view of the government, the process of the whole thing is also very powerful in that it restores internal balance within the community [32].

The emergence of corporate sustainability is a primary focus for activists, which shows the growth of concern regarding environmental and social issues within businesses. Some researchers investigated the impact of internal and shareholder activism, focusing on corporate governance and primary business activities, exploring the intersection of activism and corporate governance [33,34]. It was noted that activism is evolving from outward pressure into the structure as employees, investors, and stakeholders integrate actions into decisions, eroding traditional corporate boundaries and demanding accountability regarding environmental responsibility.

Alongside this, some authors provided empirical evidence that organized networks of activism on policy proposals by shareholders could change corporate policies on the environment and improve the performance of the firm as a whole [35–37]. This evidence demonstrates that greater collective action on a corporation's ecology policies is not purely ideological but rather an attempt to mitigate risks by managing controllable costs, creating corporate value, and protecting corporate assets. There is growing evidence that activist investors change the game by taking advantage of their control to lower the environmental risks and enhance the corporate image in the eyes of multiple stakeholders [38].

Some scholars delve into the emergent field of artivism, a compelling synthesis of artistic expression and activist intent, examining its strategic deployment across digital platforms to galvanize public engagement and foster interdisciplinary collaboration. Their research reveals how visual narratives, creative performances, and symbolic art forms are increasingly employed to render complex environmental issues more relatable and emotionally impactful [39,40]. These expressive tools do more than capture attention; they facilitate dialogue and alliance-building among artists, researchers, non-governmental organizations, and local communities. In weaving together aesthetics and advocacy, artivism deepens the cultural resonance of environmental movements and broadens their societal appeal.

Expanding on this theme of digital transformation in activism, some researchers analyze the mobilization strategy of activist movements like Fridays for Future, which has proved superior to all others in leveraging online media in order to shape policy discourse and public opinion [41]. Observations in their work indicate how digital strategy, ranging from organized social media campaigns, e-petitions, and virtual rallies, enables instant information sharing, fosters global solidarity, and offers direct access to political stakeholders. These virtual infrastructures have effectively democratized the engagement of activists, allowing grassroots and youth-led movements to overcome historical media limitations and cast their profiles onto the global scene.

Researchers highlight the intricate interpenetrations between urban environmental activism and broader urban struggles over justice and equity. In so doing, they demonstrate that urban environmental issues, everything from equitable access to green and public spaces and exposure to toxics, to housing precarity and infrastructure abandonment, are not typically disconnected from social exclusion [42,43]. Under this definition, urban environmental activism is greater than the green cause; it is a place of struggle with structural injustices. Such activism is thus often a spatial resistance, enabling marginal communities to resist gentrification and demand more inclusive urban futures. Such accounts stress the need to locate environmental action in the everyday urban, where socio-ecological inequalities are most pronounced [44].

Placing this view outward from the city and into the transnational, Martínez-Alier et al. [45] document coalitions forming between grassroots movements and intellectual researchers throughout Europe and Latin America. These partnerships have become the foundation in the scientific disciplines of ecological economics and environmental justice, where co-productions of knowledge are proving academic rigor as well as pragmatic advocacy. These alliances, the authors argue, are not just trading information but actively redistributing epistemic power to enable communities to articulate, justify, and make their environmental and territorial claims. The dialogical approach effectively bridges the divide between theory and practice, proving the efficacy and legitimacy of localized, justice-grounded environmental interventions.

Case studies like that of Lewis et al. [46], with Gunns Ltd. being involved, provide concrete evidence of financial and reputational risk to firms under sustained activist targeting. Their study traces how persistent behavior by environmental NGOs, coupled with heightened public scrutiny, can erode investor confidence, push market valuation lower, and question a firm's legitimacy. In the case of Gunns Ltd., once one of Australia's largest forestry companies, activism led to the construction of public narratives, accompanied by increased regulatory scrutiny, which ultimately accelerated the firm's financial downturn and triggered a profound reputational rupture. This example identifies civil society's escalating influence, revealing how collective grassroots pressure can substitute for corporate control in symbolic and material ways [47].

Simultaneously, brand activism is seen as a strategic shift in which companies begin to integrate sustainability and moral accountability into their public image. Some illustrate how businesses are moving away from superficial marketing to integrate social and environmental values into the heart of their brand culture [48]. Drawing on their research, brand activism not only functions as a means to reduce the risk of a bad reputation but also as a competitive advantage, particularly in consumer contexts increasingly driven by demands for transparency and values-based leadership. Through the taking of strong positions on current issues, companies seek to establish consumer trust, convey authenticity, and secure long-term stakeholder relationships in a context where the values of the brand are most important [49].

Recent bibliometric contributions have highlighted the significance of ESG integration within the context of green computing, demonstrating a sharp increase in interdisciplinary research that connects sustainability with technological systems [50]. Additionally, others have conducted a comparative bibliometric analysis that captures how digital transformation among SMEs, both before and after the COVID-19 pandemic, reshaped organizational priorities concerning sustainability [51]. Their work demonstrates that small- and medium-sized enterprises have adopted sustainable digital strategies not only as a response to crises but also as long-term frameworks for environmental governance.

Such bibliometric expansions suggest that emerging technologies no longer serve merely as instruments of efficiency but as active enablers of sustainability. Integrating ESG

principles through digital platforms represents not only a shift in compliance logic but also a paradigm shift in the way sustainability is interpreted and operationalized by institutions. The confluence of AI, blockchain, and big data in promoting ecological accountability, transparency, and real-time monitoring is increasingly recognized in scholarly discourse. These studies complement our analysis by situating environmental activism in a broader technological transformation, reinforcing our conclusion that sustainability is now a cross-sectoral and digitally mediated endeavor.

The influence of international governance bodies, especially the United Nations and the European Union, cannot be overstated. The UN's 2030 Agenda for Sustainable Development [52] and the EU's Corporate Sustainability Reporting Directive [53] have codified sustainability as a normative and operational imperative. These frameworks are not only shaping national regulations but also altering research and activism by providing common standards, targets, and monitoring mechanisms.

Generally, sustainability is no longer restricted to one discipline but has become an interdisciplinary concept that permeates almost all domains and research areas. There is a lack of studies on how the drive toward sustainability is joined and supported across domains. This research conducts a comprehensive bibliometric analysis of the intersection of sustainability and environmental activism with a view to closing this gap. Based on our literature review, we formulated the following research objectives:

O1: To conduct a bibliometric analysis of the scientific research in the area of environmental activism and sustainability from 1998 to 2025, charting the evolution of the field, and identifying its thematic content, research gaps, trends, and prominent researchers.

O2: To suggest measures that can be adopted by policymakers in various fields, from education and digital engagement through to corporate accountability and inclusive governance, as a means to implement environmental activism and sustainability projects and to make them more effective.

These objectives are to be achieved through framing two research questions:

RQ1: What are the aspects of growth and change in the research output concerning environmental activism and sustainability, what are the leading subject areas, and what are the new trends developing?

RQ2: What are the actions to be taken and the policies to be followed in social, economic, and political spheres to promote the role of environmental activism in achieving sustainability goals?

2. Materials and Methods

This present study aimed to examine the intersection of sustainability and environmental movements. In order to select and identify the most relevant documents published on these topics, we used the ISI Web of Science (WoS) database. This is a globally relevant and recognized platform for indexing scientific publications that are high-impact. The data collection took place on the 10th of May, 2025. We analyzed publications from the seminal work in 1998 until the present time (2025). Taking into account our research objectives, we applied the following two filters to the WoS database: "sustainability" and "environmental activism." These two terms were selected to include a wide but still thematically focused dataset, containing studies that relate to the topic of environmental activism as the mediator between climate change and sustainability goals. Keywords are specifically chosen by authors and editors to strengthen the discoverability of research. This also makes them reliable indicators for orientation. Furthermore, the titles are created to summarize the topic of the research. Thus, they are an important component of the bibliometric analysis. We intentionally selected the terms "sustainability" and "environmental activism" as our core search criteria to maintain thematic focus. These terms were chosen because they best

represent the intersection we aimed to explore: the influence of social movements and civic engagement on systemic environmental change.

To ensure clarity, we excluded more general terms, such as "ecology," "climate," or "green transition," which could have included articles that did not prioritize activism or social engagement in sustainability discourses. We acknowledge, however, that important related concepts such as "climate justice," "ecological citizenship," "greenwashing," and "resilience" emerged through keyword co-occurrence analysis, and we analyze these in thematic clusters.

Regarding keyword equivalence, we considered potential synonyms and variant spellings. For example, both "corporate social responsibility" and "CSR" were recognized, as were "green activism" and "environmentalism." Positive and negative aspects were also considered; terms such as "greenwashing" reflect a critical stance within the sustainability discourse, and their appearance in our dataset underscores the diversity of perspectives present.

Using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) model (Figure 1), we identified and retrieved 475 documents published between 1998 and 2025. From this preliminary dataset, we adopted the following additional filtering criteria: 45 documents were excluded due to their type; only articles and review articles were included. Furthermore, 17 publications have been excluded because they were not in English. After this filtering process, a final dataset of 413 documents was included in the full review. For the bibliometric analysis, we used VoSviewer 1.6.20, a widely used tool for visualizing bibliometric networks. Additionally, a word cloud was created to examine the keyword distributions and to underscore the most prominent terms in the dataset. Finally, Microsoft Excel 365 was used to create graphical representations and perform statistical processing of the data we retrieved.

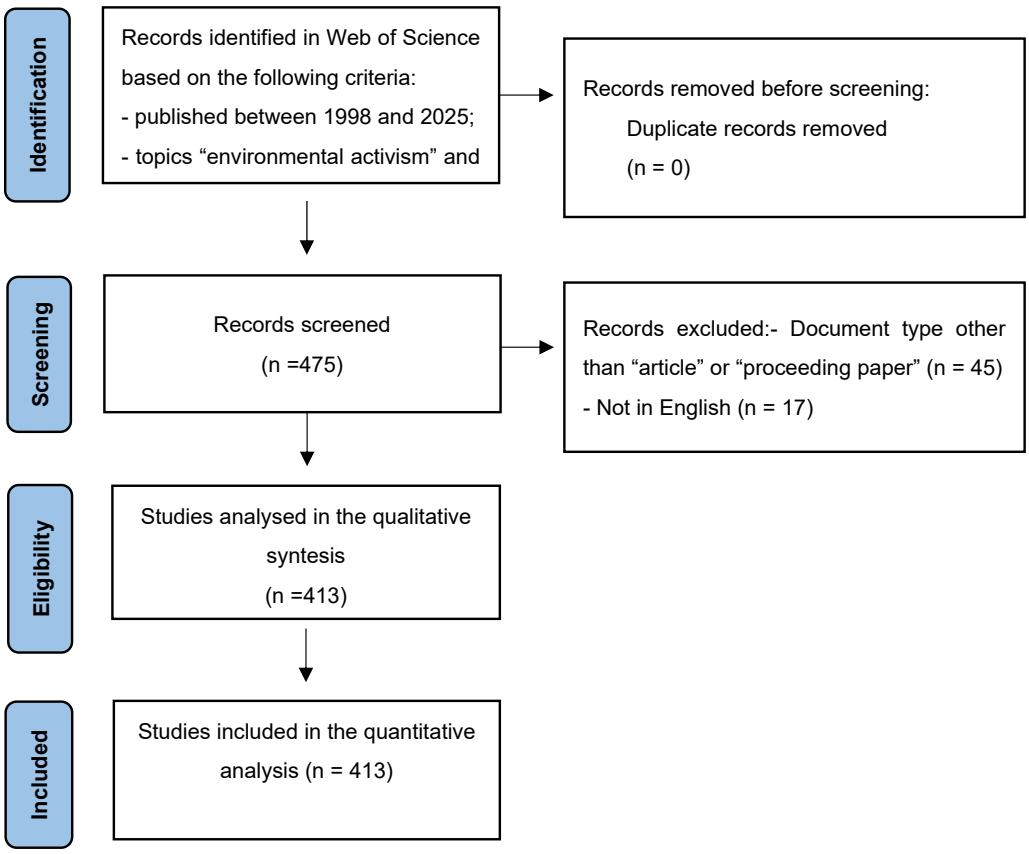

Figure 1. PRISMA work flow.

3. Results

Out of the 475 documents analyzed, 430 were articles, 22 were reviews, 19 were proceeding papers, and 16 were book chapters. The difference up to the total of 475 documents was represented by additional categories, including articles with early distributions, and highlighted the most frequently occurring terms in the dataset: additional-access status, data papers, editorial materials, biographical items, letters, and one note.

From 2011 to 2016, we report a steady upward trend regarding the research output, rising from 1.90% to 4.02%, reflecting growing interest in the field among researchers. This growth continued after 2016, with percentages rising from 4.86% in 2017 to 15.64% in 2024 (Figure 2). This marks the highest point in the dataset. The years 2021 to 2024, all above 9%, mark a peak period of scientific activity. The overall pattern indicates a decade of consistent and accelerating research growth. The distribution clearly shows how the field of environmental activism in sustainability gained popularity and relevance, moving from a limited and minimal output in the early 2000s to sustained, high-volume contributions in recent years.

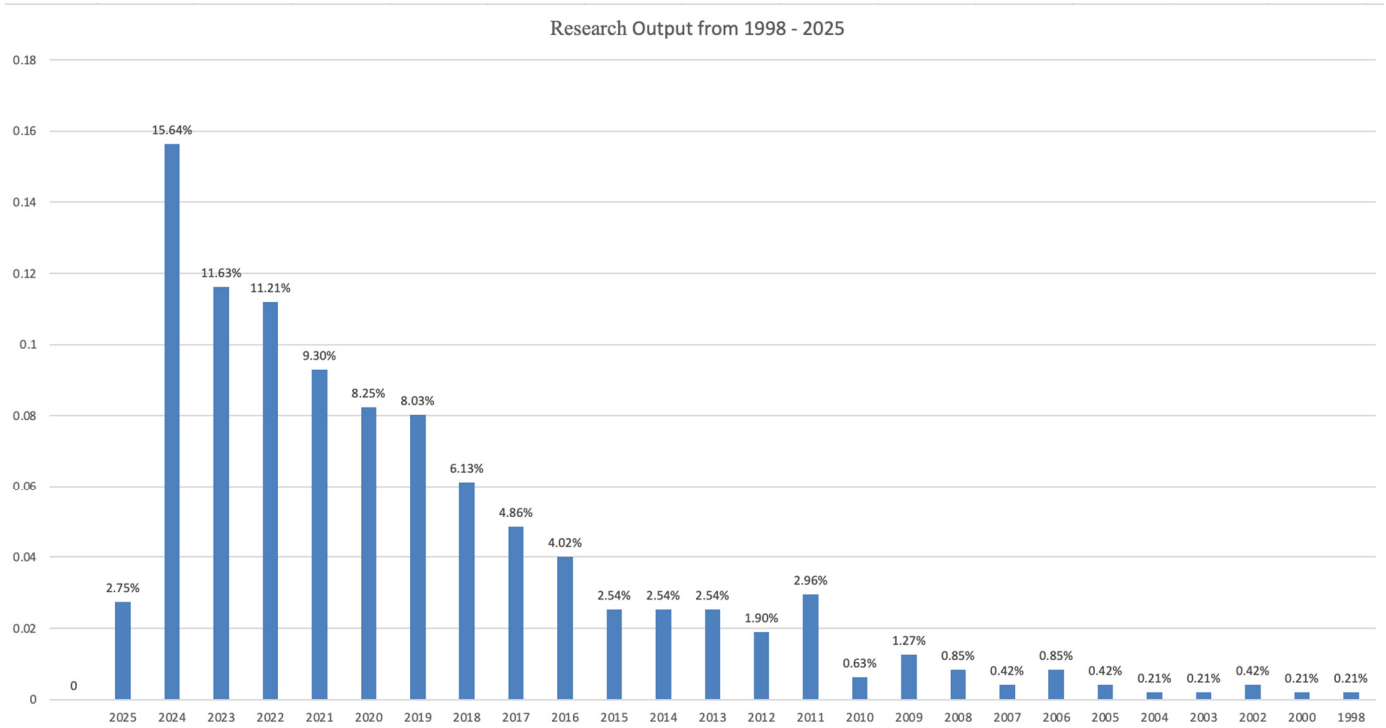

Figure 2. Number of WoS publications between 1998–2025.

The analysis we conducted of research areas linked to the keywords "sustainability" and "environmental activism" points to the interdisciplinary nature of these two terms. Environmental sciences and ecology lead at 22.49%. This highlights the important role of ecological and environmental studies in understanding sustainability challenges and inspiring environmental activism (Figure 3). Following in second place (closely) is business and economics with 13.12% of the total. This points to the need for economic strategies that are sustainable and business models that advocate for activism initiatives and environmental policies to be adopted. Next is science and technology, representing 9.37% of the total research output. This emphasizes the central role of technological innovation and applied research in developing solutions to environmental issues.

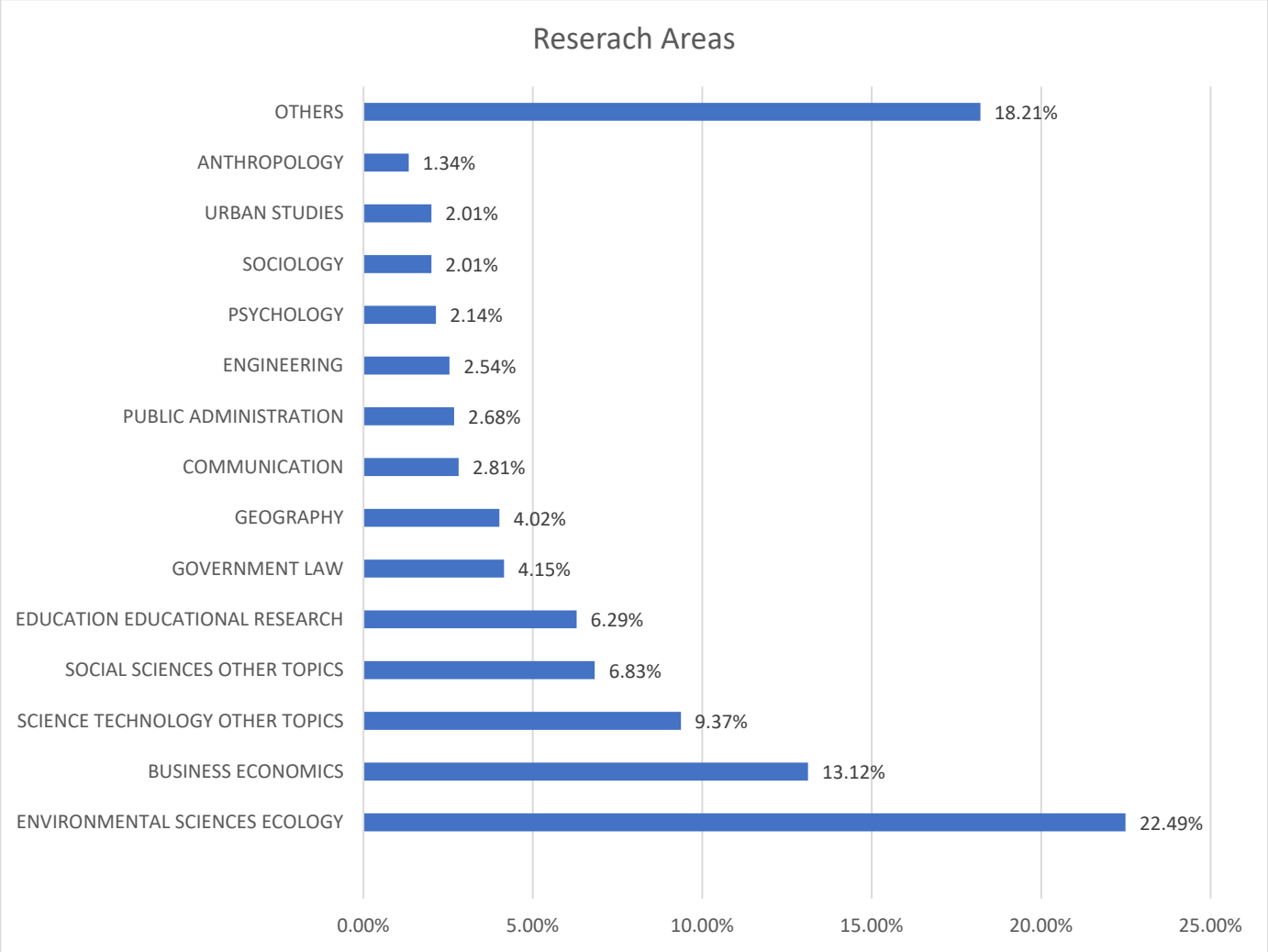

Figure 3. Distribution of publications based on research area.

The presence of social sciences (6.83%) and educational research (6.29%) underscores the role of education, awareness, and social engagement when it comes to cultivating environmental activism. Government law (4.15%) points to the significance of legal frameworks and public policies that regulate and promote sustainability initiatives. Geography (4.02%), communication (2.81%), and public administration (2.68%) reflect the importance of spatial understanding, effective message dissemination, and policy implementation in environmental fields.

Engineering (2.54%) and psychology (2.14%) represent two additional aspects of the problem—the technical one and the behavioral one—related to the use of technology of organic nature as opposed to unmanageable, and the people's internal state of motivation and behavior. Sociology (2.01%), urban studies (2.01%), and anthropology (1.34%) show how social, cultural, and urban issues have the potential to change the development and activism of environmental sustainability.

The "others" group, which is made up of various research areas with each contributing less than 1% but collectively adding up to 18.21%, gives a lot of valuable input from many different areas, like chemistry, physics, international relations, and biodiversity conservation. This is evidence not only of the truly interdisciplinary nature of sustainability and environmental activism research but also of the breadth of fields involved. Overall, this distribution reflects the complexity and diversity of approaches needed to understand and

promote sustainability and environmental activism, where natural sciences, social sciences, technology, economics, and policy all play essential and complementary roles.

Overall, this distribution reflects the complexity and diversity of approaches needed to understand and promote sustainability and environmental activism, where natural sciences, social sciences, technology, economics, and policy all play essential and complementary roles.

Figure 4 presents the co-occurrence network visualization map of keywords produced by VoSviewer. The most prominent keywords are as follows: sustainability (174 occurrences, TLS = 644); activism (120 occurrences, TLS = 503); management (40 occurrences, TLS = 177); climate change (occurrences = 32; TLS = 172). The map features four main clusters. The first (Red) has 26 items, 85 links, TLS = 509, 174 occurrences. It is focused on the core themes of "sustainability," "climate change," and "politics." This cluster emphasizes the politics of sustainability, addressing issues such as environmental justice, democracy, social movements, gender, health, education, and community. The prevalence of terms such as "power," "social media," and "knowledge" indicates the important role of political participation, public awareness, and communication in advancing sustainability agendas. This cluster illustrates how sustainability has its foundation in social and political environments, highlighting the complex relationship between environmental issues and societal structures.

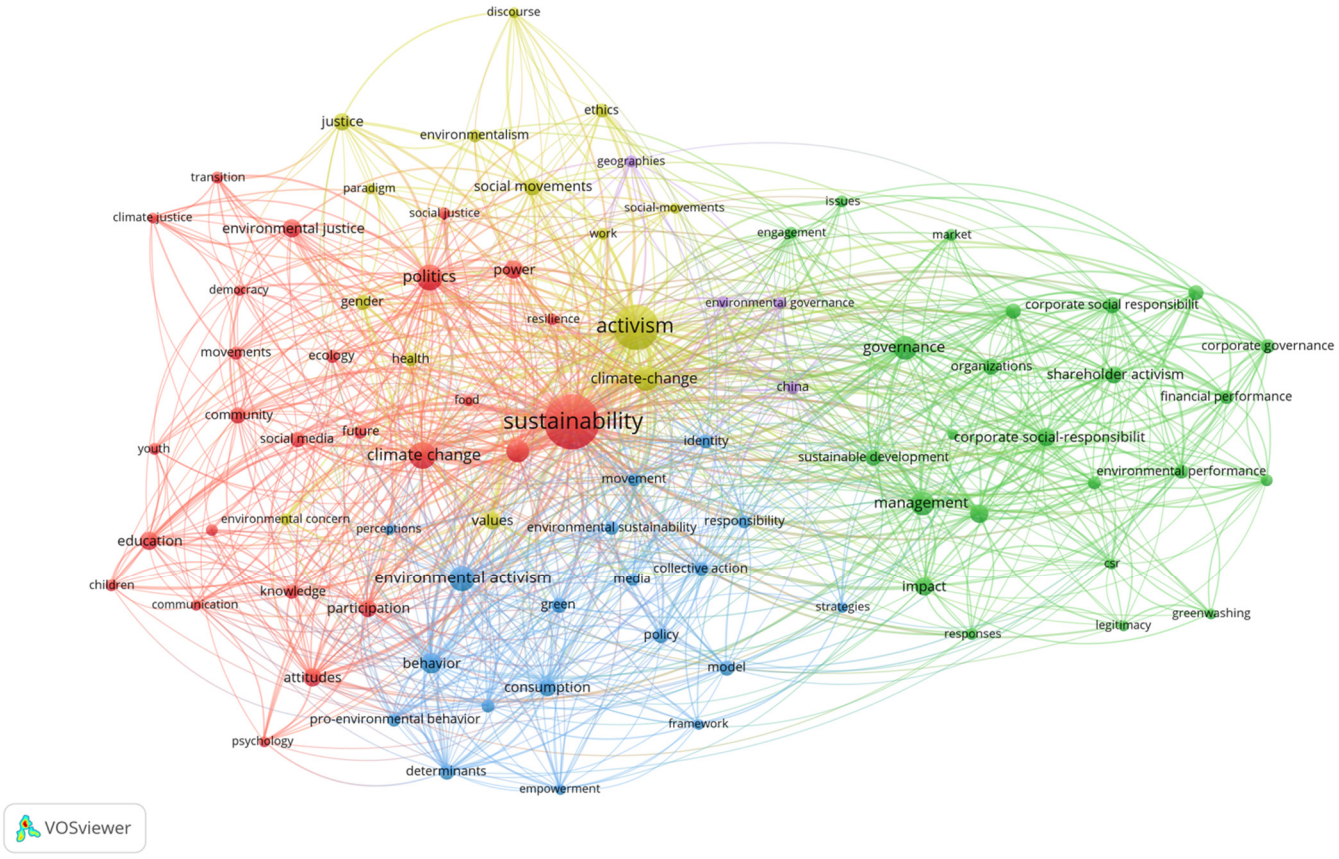

Figure 4. Network visualization map of keyword analysis.

The green cluster contains 24 items, 53 links, TLS = 139, and 32 occurrences. It is centered on corporate social responsibility (CSR), governance, and management. Terms like "corporate social responsibility," "shareholder activism," "corporate governance," "financial performance," and "greenwashing" are the keywords for this category. This cluster expresses the intersection of business practice and sustainability, revealing how

companies address environmental matters through governance, strategic management, and relationships with stakeholders. The appearance of "legitimacy" and "impact" also points to arguments about the sincerity and effectiveness of corporate sustainability.

The third cluster (blue) has 52 links, TLS = 110, 38 occurrences. This cluster focuses on environmental activism, behavior, and policy. The most important words are "environmental activism," "behavior," "consumption," "policy," "media," and "empowerment." This clustering emphasizes the environmental engagement's behavioral and psychological aspects, such as attitudes, pro-environmental behavior, participation, and determinants of sustainable behaviors. The occurrence of the words "framework" and "model" reflects an interest in theoretical and practical views on comprehending and promoting environmental activism at both the collective and individual levels.

The fourth cluster (yellow) has 14 terms, 84 Links, TLS = 409, and 120 occurrences. It is closely related to ethics, social movements, and activism. Some of the terms covered are "activism," "social movements," "power," "justice," "ethics," "environmentalism," and "discourse." The cluster focuses on the discursive and normative elements of environmental activism and considers how values, ethics, and social justice shape movements and public discourse. The frequency of "resilience" and "identity" suggests responsiveness to adaptive capacities for change and shared identity formation in the interests of cause-driven sustainability issues.

The visualization shows high cross-linkages between clusters, demonstrating the interdisciplinarity of sustainability and environmental activism studies. For example, the frequency of "sustainability" occasions political, behavioral, corporate, and activist perspectives, emphasizing that effective sustainability initiatives involve reconciling social, economic, environmental, and governance facets.

The intersection of the political (red) and activism (yellow) clusters captures the power of social justice and moral concerns in shaping environmental movements. Concurrently, the connection between the behavioral (blue) and corporate (green) clusters captures the strength of individual and organizational behavior in driving sustainable outcomes.

The network visualization map provides an interesting picture of international research cooperation and influence. The United States ranks first, with 140 documents and over 4000 citations (Figure 5). Even though the UK produces only 54 documents (as opposed to the USA's 140), the UK research has the highest total link strength (TLS) and is highly cited (almost 3000 citations). The quality of UK researchers' studies is the major reason for their eminent position and the vast worldwide network of these researchers. UK researchers are not only conducting the most influential studies but are also deeply embedded in the international society of collaborating researchers.

In addition, connections in one part of the map illustrate that there are a multitude of interfaces between the United Kingdom and other nodes located in different countries, indicating these relationships. Most of the close relations England shares can be easily noticed by the variety of connections, especially the ones with some English-speaking countries such as Australia, New Zealand, and Scotland. The blue cluster is the most visible group in the network, with the main characteristic of the group being similar language and, hence, cultural likeness, which facilitates collaboration.

The main sources of connection between these European countries are geography, language, and shared scholarly traditions, from which it can be seen that the European countries are more interconnected. The formation of European countries into several distinct nodes represents the curious phenomenon of regional cooperation expressed in the geographical, linguistic, and cultural contexts of European unity. The green cluster, which contains Spain, Italy, Belgium, and Switzerland, is part of a Southern and Central European research community. The red group, which unites Germany, Norway, Sweden,

and Austria, is considered to represent a solid Northern European research community. These factions mirror geographic proximity and the strength of regional ties in various aspects of community life.

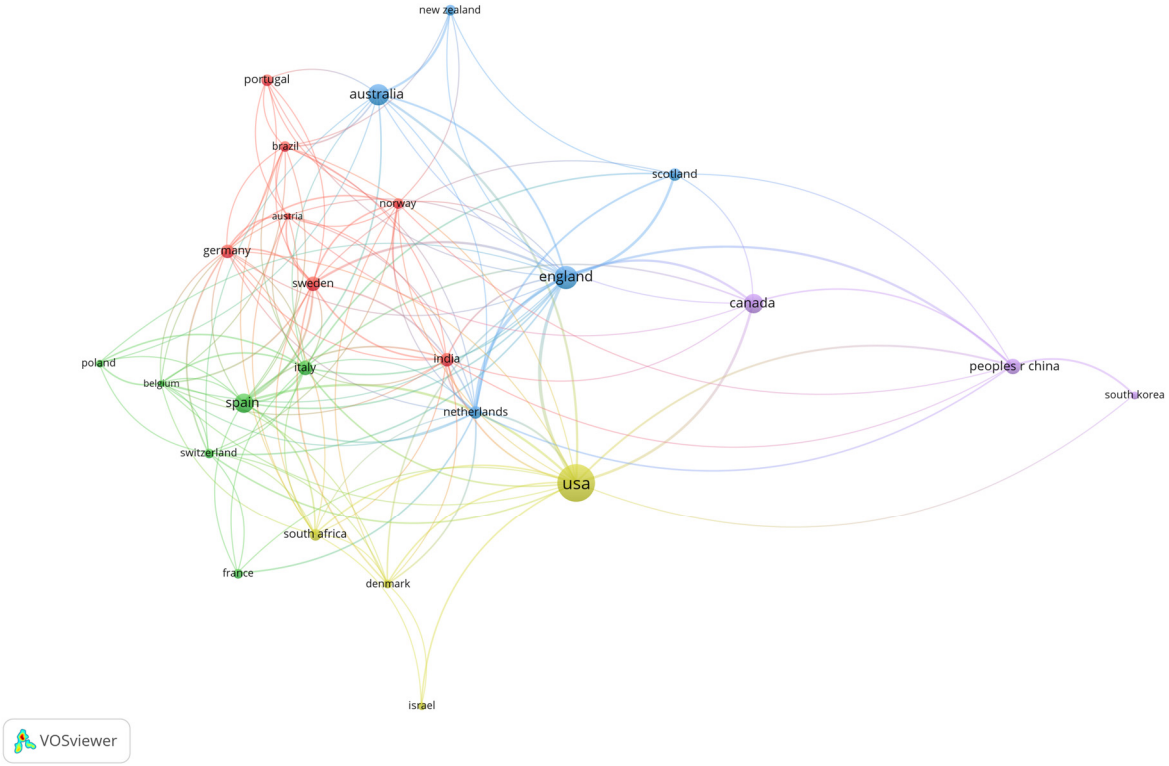

Figure 5. Network visualization map of countries' co-occurrence.

Meanwhile, the purple cluster consists of Canada, China, and South Korea, which are taking preliminary steps to establish developing intercontinental partnerships that may very well be the global research of the future. These connections indicate that in the future, there will most likely be a wide variety of collaborative possibilities other than the Western-dominated ones.

Overall, this map reveals the process by which research is produced and communicated globally. The USA leads in numbers and citations, yet England's role as a collaborative hub has the potential to bring together isolated research clusters. European countries have regional collaborations, and bridges are forming between continents.

Figure 6 illustrates that Elisenda Ardevol and Sandra Martorell have the highest number of papers among all the authors, with four papers each and 29 citations each. Gemma San Cornelio, who had three papers and was quoted 15 times, has also been active. This has made her a bridge between the groups, enabling her to become a connector.

The co-authorship network can be seen to include two groups of collaboration among authors in the area. The first cluster, shown in red, is mainly the network of Isabelle Anguelovski, Beatriz Rodriguez-Labajos, and Leah Temper. They not only have very good relations between themselves but also show similar thematic interests, and therefore frequently collaborate and co-publish together. The concentration of relations in this cluster indicates that it is also a stable collaboration and that the scholarly work is ongoing.

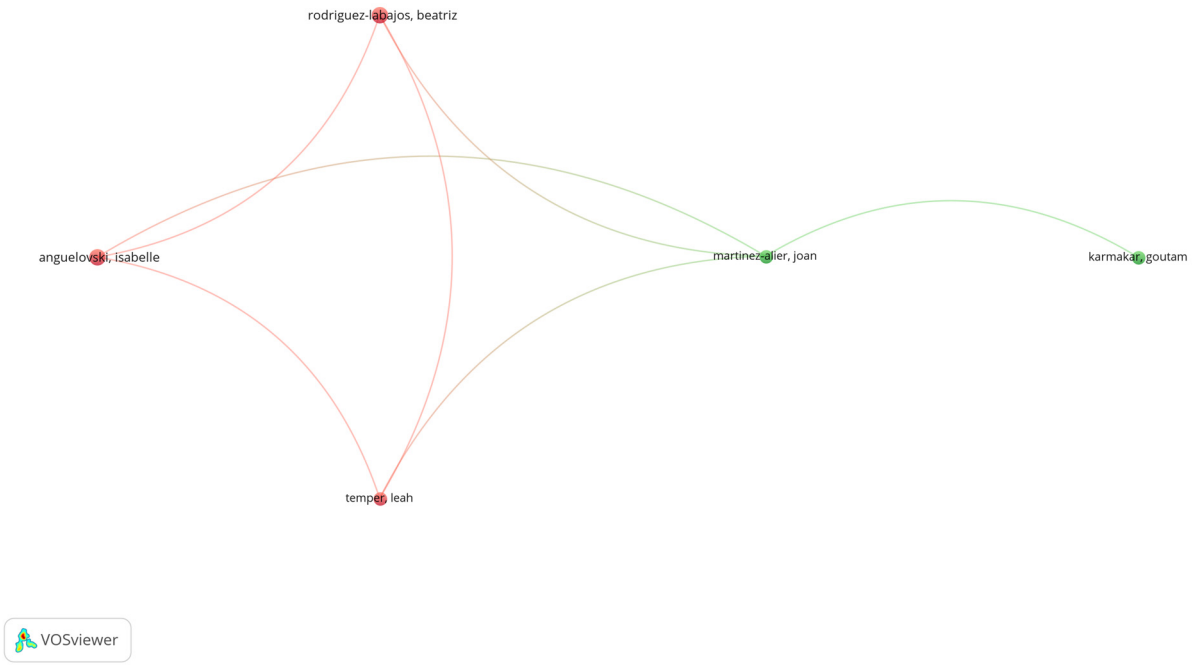

Figure 6. Most influential authors' contributions.

On the other hand, the small green cluster consists of Joan Martinez-Alier and Goutam Karmakar, with only one direct connection between them. Martinez-Alier's weaker connection to the red cluster is another issue. The small number of lines linking the clusters indicates that this is a situation where the concerned institutions work in a similar area or a common field and are likely to be in the same city, etc., rather than in a common network.

Figure 7 presents a word cloud of the most frequent keywords in the domain of environmental sciences, the leading one among the WoS categories. The most frequent keyword is "sustainability," holding 16.03% of all the keywords in this domain. This shows the trend of scholarly work on the importance of sustainability. The second most frequent word is "activism," holding 10.79% of all the keywords. This shows scholars' concern with social mobilization, civic activism, and collective action. The third position term is "politics," taking up 7.87% of the entire keywords. This shows the regulatory and institutional emphasis of the research material on activism as a topic. Other dominant keywords are phrases like "climate change" (7.29%), "environmental activism" (3.21%), "management" (3.21%), and "justice" (2.29%). Overall, this keyword distribution suggests the coming together of sustainability as a normative ideal, activism as the vehicle for realizing this ideal, and climate change as the issue.

In our keyword search across all of these databases, we aimed to identify core themes and research topics of interest to achieve our objectives. To gain a deeper understanding of the intellectual context where sustainability merged with environmental activism, we conducted a systematic keyword analysis of the selected body of literature.

Our keyword analysis made it possible to discover the themes and ideas that have emerged. By analyzing the frequency of the keyword occurrences and grouping the terms, we categorized the data into six main themes that indicated the various traits of the research output regarding environmental problems. In addition, these themes are not only a typology of the current academic interest but also an interpretive framework to understand how different aspects of activism, governance, policy, and behavior intersect with sustainability goals. The following is an analysis of themes with illustrations of key aspects, leading authors, the most influential works, and research gaps (Table 1).

Figure 7. Word cloud keyword analysis—environmental studies.

Table 1. Main research theme analysis.

Theme 1: social media and climate justice activism	Prominent terms: social, media, justice, movements, financial stability, change	Influential contributions: [54] Lovell, S. T.; [55] DiNella, M.; [37] Yang, C.-Y.; [56] Cunha, A.; [57] De Rosa, A.; [46] Case, R. A.; [58] McCally, M.; [59] Giacomo, S.; [60] Morigi, J.; [61] Checker, M.; [2] Temper, L.; [1] Martinez-Alier.
Theme 2: climate change, health, and educational policies	Prominent terms: climate change, health, education, policy, nurses, engagement, impacts	Influential contributions: [62] Abdelaliem, S. M. F.; [63] Lockrey, S.; Adams, A. E.; [64] Dietrich, A.; [65] Kowasch; [66] Hess, D. J.; [67] Tomnyuk, V.; [68] Piscitelli, A.; [69] Wolf, J.; [70] Montinel, I.; [71] Lee.
Theme 3: local leadership, non-violent activism, and gender equality	Prominent terms: leadership, non-violent, local, women, peace, power, change	Influential contributions: [72] Lyon, T. P.; [73] Waterfall, P. H.; [74] Romano, S. T.; [75] Yonekura, A.; [76] McLean, M. O.; [77] Smith, T.; [75] Thomson, I.; [78] Barr, S.; [79] Curran W.; [80].
Theme 4: pro-environmental behavior and personal sustainability	Prominent terms: behavior, green, initiatives, eco, employee, pro, study	Influential contributions: [81] Zheng, C.; [62] Abdelaliem, S. M. F.; [82] Hashem, R. A.; [83] Sabelfeld, S.; [84] Drury, J.; [85] Anguelovski, I.; [86] Paredes, M. R.; [87] Ansari, F.; [80] Koehrsen, J.; [88] Basch C.; [89] Hilder C.
Theme 5: ESG, corporate performance, and sustainable investment	Prominent terms: corporate, ESG, firms, governance, investment, focus, disclosure, financial, funds	Influential contributions: [90] Singhania, M.; [91] Donoghue, J.; [92] Slager, R.; [93] Dyck, A.; [92] Homanen, M.; [94] Habermann, F.; [95] Liu, Y. S.; [96] Rustam, A.; [97] Daugaard, D.; [98] Callery, P. J.; [99] Bencze L.; [100] Almers E. [101].
Theme 6: urban development, sustainable consumption, and community	Prominent terms: sustainable, food, development, consumption, urban, community, public	Influential contributions: [102] Pe'er, S.; Jenkins, K.; [103] MacNeil, C.; [104] Penzenstadler, B.; [105] Ozola, A.; [106] Crosby, A.; [107] Menezes, I.; [108] Haucke, F. V.; [109] Orea Ginear [110].

Theme 1: This theme signifies the central role of social media platforms in mobilizing public action on ecological and social concerns. Research in this category focuses on the

effect of networked activism, online communication strategies, and digital community creation. Scholarship on university student participation in sustainability activism is present here, with a recurring emphasis on intersectionality, particularly in terms of gender, race, and class [54]. Others have criticized growth paradigms and advocated for a justice-oriented environmental narrative [42]. Engaging communities through artistic and media-related means also seems to be the most critical mobilization strategy [57]. While the volume of activity in this domain is growing, cross-platform comparative analysis, longitudinal examination of the real-world effects of digital activism, and Global South contexts are underrepresented in case study samples.

Theme 2: This theme displays the relationship between environmental stress and human health and education contexts. It reveals the extent to which climate language infuses health science and pedagogy. Researchers in this category have highlighted the transition from climate concern to real action [66], examined Pacific Island education systems' sustainability policy [65], and mapped educational programs promoting product innovation with an environmental emphasis [63]. There is a need for systemic curriculum reform research, tighter links between climate research and shifts in behavior, and more research into the mental health aspects of environmental change.

Theme 3: This theme focuses on the micro-politics of transformation, with a focus on local agents, civic action, and the specific agency of women and vulnerable groups in advancing sustainability initiatives. Leadership in sustainability education [76], corporate engagement with green ethics [72], and social auditing as a justice mechanism [75] have been the main areas of concern. Further research is needed on new local leaders, especially in climate-risk contexts, and religious and indigenous leadership models that lie outside dominant institutional systems.

Theme 4: This theme looks at how individuals and organizations adopt and promote sustainable action, traditionally rooted in psychological theory and behavioral science. Scholars have linked environmental justice to grassroots activism [1], studied exclusion in sustainable urban development [85], and studied the impact of group identity on climate protest participation [84]. Current literature lacks an examination of the role of mobile technologies and apps in ecological behavior, as well as cross-cultural variation and socio-economic limitations on sustainable practice.

Theme 5: This theme brings together environmental activism and corporate strategy to analyze the way companies react to growing demands for transparency, accountability, and ESG integration. Works such as [93,96] have explored ESG-performance relations, while ref. [92] has been concerned with institutional pressures and disclosure dynamics. Research is still limited in the scope of SMEs and non-OECD environments. Critical analysis of greenwashing practices and the everyday use of ESG in firms is also greatly needed.

Theme 6: This final theme deals with city-scale interventions, lifestyle politics, and collective action addressing ecological concerns in urban areas. Ref. [111] established a foundation for an energy justice approach in city policy. Ref. [102] pointed to the role of education in sustainable consumption, while ref. [108] examined the co-evolution of ecological values among communities. There is a relative lack of research on peri-urban sustainability, urban tourist environmental effects, and rising middle classes' consumption behaviors, particularly in economies in transition.

4. Discussion

Our bibliometric analysis generated several takeaways regarding the intersection of environmental activism and sustainability. We report a significant increase in scholarly interest in these topics in the last two decades, with a peak in the period 2021–2025. This upward trend points to the growing awareness of issues surrounding the environment

and the role activism has in generating momentum, social change, and politics. We would like to note that even though the volume of the research output is mainly coming from the United States, with double the number of documents published as the United Kingdom, which is in second place, we observe an increased level of international collaborations. This indicates an academic network that is well integrated and one that has influence all across the globe.

The analysis we conducted on the distribution of research on this topic is an interdisciplinary one. The prominence of environmental studies and ecology confirms that the challenges regarding the environment are addressed from the point of view of conserving and protecting ecosystems. At the same time, the consistent presence of domains related to economics and business stipulates the initiatives to integrate sustainability into economic and governmental strategies. This very intersection between the natural studies and the social ones becomes essential to gain a deeper understanding of the complexity of environmental activism. This implies both changes at the individual and the collective levels and institutional and political reforms.

The network visualization map of the keyword analysis revealed the main themes that define the structure of the scientific research output: social and political dimension, corporate responsibility, pro-environmental behaviors, and social activism. This confirms the argument that sustainability cannot be viewed as an isolated construct. Instead, it has to be viewed through a lens that includes social justice, ethics, and civic participation. Therefore, this strong connection between activism and social movements underscores the importance of collective values and identities in inspiring change.

Regarding geographic findings, international collaborations are influenced by cultural and linguistic aspects, but regional proximity also has a significant influence. The academic network is structured into regional clusters, but we report the emergence of intercontinental connections that can contribute to the enhancement of global sustainability and activism goals.

Our findings underscore that environmental activism and sustainability are constantly evolving domains, and the growing interest in this topic and the international collaborations point to an active scientific community that does not limit itself to environmental aspects but instead explores social, behavioral, and governmental angles at the same time. In addition, our thematic keyword analysis reveals the emerging initiatives that look to develop strategies, initiatives, and policies to combat the pressing issue of climate change (RQ1).

Future research should focus on gaining a deeper understanding of digital activism, as well as the role that local leaders play in vulnerable contexts. Moreover, the integration of technologies for the promotion of sustainable behaviors needs to be analyzed more closely. In order to understand and promote sustainability through environmental activism, there is a need to strengthen collaborations across the globe and to develop a theoretical framework that reflects the social, cultural, and ecological diversity of our world. Based on these findings, we propose the following practical recommendations for policymakers and scholars to reach sustainability goals through activism (RQ2):

The analysis revealed a clear need for a curricular transformation that involves not only the technical aspects of climate change but also the social, ethical, and political aspects. Policymakers and stakeholders should endorse the development of educational programs that support and promote critical thinking, social awareness, and civic duty among young people. This would prepare them to take active roles in environmental movements.

Taking into account that social media is becoming a primary promotion tool for any topic, initiative, or movement, it is crucial to support digital activism as a legitimate, valid, and efficient form of activism and civic participation. At the same time, there needs to be

mechanisms in place to combat and manage misinformation. This would ensure that the online space remains inclusive and secure.

The cluster that was dedicated to corporate social responsibility highlights the tensions between the public discourse of companies regarding sustainability and their real practices. Upper management needs to strengthen the legislation and the mechanisms that control and ensure transparency, responsibility, and the real impact of CSR initiatives. This includes the active participation of important players and stakeholders of the civic society.

Our analysis revealed that the activity and contributions of local leaders are significant and very influential. This is especially important when it comes to promoting and driving changes toward sustainability for marginalized and vulnerable groups.

Legal systems, policy priorities, and cultural contexts powerfully shape the form and substance of environmental activism and sustainability discourse. For instance, while European countries operate within a supranational policy framework such as the EU Green Deal and the CSRD, the U.S. maintains a more decentralized, litigation-based approach [12,52,112].

Moreover, countries in the Global South, such as Brazil, India, or Kenya, often feature unique activism narratives centered on land rights, indigenous sovereignty, and environmental justice in postcolonial and resource-extractive contexts. These dynamics are not always visible in English publications indexed in databases like Web of Science.

To partially address this limitation, our analysis recognized region-specific clusters of research activity, as seen in our co-authorship and co-citation networks. Future research should explicitly explore regionally grounded forms of environmental mobilization that may remain underrepresented in mainstream bibliometric analyses.

The role of supranational governance institutions is pivotal in setting both normative agendas and operational frameworks for sustainability and environmental activism. The United Nations' 2030 Agenda for Sustainable Development has provided a globally adopted blueprint, where Goals 13 (Climate Action) and 17 (Partnerships) directly influence both activist and policy landscapes. Activists and NGOs often align their advocacy strategies with these frameworks, using them as leverage points in negotiations and campaigns [52,53].

The European Union, through mechanisms like the European Green Deal and the CSRD, has further institutionalized sustainability. These instruments demand transparency, measurable targets, and stakeholder engagement, influencing both corporate behavior and civil society's capacity to hold institutions accountable. For example, the CSRD requires companies to disclose environmental impact information based on "double materiality," a principle born from activist and academic pressure for more holistic sustainability accounting [53].

Our analysis acknowledges the important role that these global frameworks play in standardizing language, metrics, and strategic objectives across jurisdictions. Their presence reflects a shift: sustainability and activism are now globalized discourses, governed not just by state actors but by institutions that coordinate, finance, and legitimize collective action [113].

The nuanced and interconnected theme and framework of this topic suggest that fragmented solutions cannot effectively respond to the challenges posed by the changing environment. Policymakers must put in place global policies that include collaborative efforts and the active participation of communities.

Study Limitations

Even though our analysis offers valuable insights into the intersection of sustainability and environmental movements, we must acknowledge several limitations to our study. First, the documents we analyzed have been retrieved exclusively from the ISI WoS database. This could potentially limit the scope of the published documents that were included in

the analysis. Other databases, such as Scopus and Proquest, have not been explored. Second, all of the documents we analyzed were in English. This could underestimate the potential contributions and perspectives of other countries from the Global South, where environmental activism can have different forms and implications.

A further limitation lies in the underrepresentation of studies from the Global South, which may affect the findings by skewing them toward Western-centric academic perspectives. Future research should explicitly aim to incorporate non-English sources and broader regional datasets to enhance global inclusivity.

Even though our keyword analysis has been rigorous, some qualitative data that could provide context and nuance to the analysis may have been left out. Future research could focus on adopting a mixed-methods approach that allows for the qualitative examination of publications to gain a deeper understanding of the evolution of scholarly work on this topic. Finally, our analysis includes publications up to 2025; however, some emerging trends regarding digital activism and recent political changes may not be fully reflected in the results.

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