

THE INFLUENCE OF LEADERSHIP STYLES ON EMPLOYEES' SUSTAINABLE BEHAVIOR

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Abstract

Leadership is crucial for promoting sustainable organizational behavior amid growing global environmental concerns. This study reviews how various leadership styles impact employees' sustainable actions, focusing on pro-environmental and organizational sustainability. A bibliometric analysis of Scopus-indexed articles from 2019 to 2025, which was run on June 25th, 2025, using VOSviewer and Biblioshiny, highlighted „leadership” as the central theme, but also “psychology”, “sustainable development”, or “employee performance”, with China, the UK, and South Korea as key research hubs. Journals like Sustainability (Switzerland) and the Journal of Environmental Protection and Ecology are prominent publication venues. The study emphasizes that leadership's effectiveness in sustainability is enhanced by organizational factors such as internal communication, procedural justice, and green HR practices. However, there are still gaps in research on hybrid leadership models and the long-term impact of leadership on sustainable behavior. The findings contribute to theoretical understanding and provide practical insights for developing sustainability-focused leadership in organizations.

Keywords: Leadership styles, Bibliometric analysis, VOSviewer, Biblioshiny, Ethical leadership, Green leadership, Employee engagement.

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1. INTRODUCTION

In an era marked by climate change and environmental crises, organizations increasingly recognize the importance of integrating sustainability principles into their strategies and operations. Leadership plays a pivotal role in shaping organizational culture and influencing employee behavior toward sustainability.

Different leadership styles steer strategic orientation and directly affect employee engagement with pro-environmental initiatives.

The scholarly discussion on leadership and sustainability has expanded considerably, emphasizing how leaders can motivate, empower, and align employees with sustainable goals. Leadership approaches such as ethical, transformational, servant, green, authentic, participative, and digital leadership contribute to sustainable outcomes through mechanisms like psychological empowerment, organizational justice, and shared green visions that foster pro-environmental mindsets.

This study synthesizes recent research on the link between leadership styles and employees' sustainable behaviors. Using a bibliometric approach, it maps the main themes, co-authorship networks, and publication sources in the field, underscoring leadership's role as a catalyst for organizational change toward sustainability. By analyzing the evolution of research from 2019 to 2025, the study seeks to identify emerging trends, research gaps, and opportunities for integrating hybrid leadership models that may better address the complexities of sustainability in a fast-changing world. Therefore, the following research questions were formulated:

RQ1: What are the most frequently co-occurring keywords in the selected body of literature, and how do they cluster thematically?

RQ2: How do countries collaborate in the field of study, and which nations form the strongest co-authorship networks?

RQ3: Which scientific journals indexed in Scopus contribute most significantly to the field, based on the number and impact of their publications?

RQ4: How has scholarly output evolved over the selected time period, and which authors demonstrate consistent or emerging productivity?

2. LITERATURE REVIEW

In the context of escalating global environmental challenges, the role of leadership in shaping sustainable organizational behaviors has become a focal point of contemporary research. Leadership styles influence not only strategic directions but also employee engagement in sustainability initiatives. This literature review synthesizes recent contributions across multiple studies to examine how various leadership styles impact employees' sustainable behavior, especially within the framework of pro-environmental actions and organizational sustainability.

2.1 Ethical, mindful, and transformational leadership

Ethical leadership has emerged as a critical driver in fostering sustainable behavior among employees. Alsheref et al. (2024) emphasize that ethical leadership significantly enhances employees' psychological empowerment, which in turn promotes sustainable performance. Liu et al. (2023) add that mindfulness plays a crucial role in empowering green performance, particularly when combined with a supportive organizational climate. Ethical leaders, by modeling integrity and responsibility, instill a sense of environmental accountability among their subordinates.

Transformational leadership, characterized by inspirational motivation and individualized consideration, also demonstrates a significant impact on sustainability outcomes. Zheng et al. (2023) confirm that transformational leadership fosters pro-environmental behavior by enhancing employees' work promotion focus and reducing emotional exhaustion. Their study, based on the tourism and hospitality industry, reinforces the psychological pathway through which leadership can activate eco-conscious behaviors. Nguyen, Simkin, and Canh (2023) further explore the broader connection between transformational leadership, innovation, and digital organizational practices, highlighting their collective role in shaping sustainability.

2.2 Green, servant, and authentic leadership

The evolution of green leadership styles reflects a growing recognition of environmental priorities in organizational leadership. Ghani, Ma, and Naseer (2023) explore how green transformational and servant leadership styles enhance sustainable performance, especially when mediated by employee traits like conscientiousness and extraversion. Similarly, Kim, Lee, and Kim (2023) reveal that ethical leadership positively affects green voice behavior, particularly when psychological distance and green climate perceptions are factored in.

Authentic leadership further strengthens the environmental culture of organizations. Zhang et al. (2023) demonstrate that a green shared vision, rooted in responsible leadership, serves as a bridge to fostering green behavior among employees. Tariq et al. (2025) add that green servant and green authentic leadership styles promote pro-environmental behavior through mechanisms such as green goal clarity, environmental passion, and the Pygmalion effect.

Karatepe, Avci, and Eltarawneh (2024) expand this understanding by suggesting that emotionally intelligent leaders who embody green values serve as critical role models. These leaders influence employees through affective commitment and social learning, enhancing the likelihood of sustainable behavior adoption.

2.3 Participative, digital, and resilient leadership

Participative leadership, which emphasizes inclusion and shared decision-making, contributes to sustainable behavior through increased knowledge sharing. Tan, Sulaiman, and Khan (2023) illustrate that participative leadership enhances intra-organizational communication, which is essential for embedding sustainability into daily routines. Mohammed, Panno, and Giorgi (2024) support this by showing that internal communication drives employee engagement in green behaviors.

Digital leadership, a relatively emerging concept, is closely tied to sustainability in innovation-intensive sectors. Cheng, Jin, and Kwak (2025) show that digital leadership enhances organizational sustainability through mediating factors like digital organizational culture and digital capabilities, especially in small and medium-sized enterprises undergoing digital transformation. Wang, Lee, and Wu (2023) corroborate this link by exploring how performance indicators and leadership orientations contribute to innovation performance in firms committed to sustainability.

In uncertain and dynamic environments, resilient leadership plays a pivotal role. Zhao et al. (2024) find that resilient leaders foster psychological safety, which encourages sustained employee commitment to pro-environmental behaviors even under stress or external shocks. This builds a robust cultural framework for long-term sustainability.

2.4 Organizational enablers and moderators

Leadership alone is insufficient without organizational enablers that reinforce sustainability goals. Zhang et al. (2023) suggest that a green shared vision enables coherent action between leaders and employees. Tang, Anjum, and Khoso (2024) highlight that organizational justice—especially procedural fairness—amplifies the effect of leadership on creative engagement in green initiatives.

Wang, Lee, and Wu (2023) demonstrate that performance metrics aligned with innovation and sustainability strengthen employee motivation, particularly in R&D teams. Similarly, Mohammed et al. (2024) point out that robust internal communication systems solidify sustainability culture and leadership messaging. The work of Karatepe et al. (2024) also emphasizes the critical role of HR and cultural mechanisms in enabling leaders to support employee well-being and sustainable performance.

Cultural and contextual variables also shape how leadership styles influence behavior. Tanveer, Khawaja, and Tarar (2025) argue that adaptable green leadership strategies are necessary to account for cross-national cultural differences.

2.5 Integrative insights and research gaps

Overall, leadership styles play a fundamental role in shaping employee-driven sustainability. However, further research is needed to explore hybrid leadership models that integrate ethical, digital, and transformational traits. Longitudinal studies could provide more insight into the stability and evolution of green behaviors over time. Moreover, the integration of organizational systems—such as HR practices, performance management, and cultural interventions—could enhance the effectiveness of leadership styles in promoting sustainable behaviors.

3. RESEARCH METHODOLOGY

A bibliometric analysis was used for this study because it was the most suitable approach to find answers to the formulated research questions, as it offers a comprehensive overview regarding the most important papers and relevant academic research in a particular discipline. Additionally, a bibliometrics approach can be used to assess the impact of academic publications and their role in spreading information (Ellegaard and Wallin, 2015).

The objective of this article is to explore the connection between leadership styles and employees' green behavior, focusing on the new trends of research in this area.

The conducted analysis was done on June 25th 2025 and used publications from 2019 to 2025. The exclusion list comprised: the other languages except English, incomplete articles, articles in press and issued year (other than the period 2019-2025).

In order to answer the developed research questions for this study, the authors formulated the following secondary objectives:

O1: To determine the keywords that appear most often together in the chosen collection of literature

O2: To analyze the co-authorship between the countries.

O3: To pinpoint the most pertinent scientific sources listed in Scopus, considering the quantity and significance of publications pertaining to the field.

O4: To identify the authors' production over the specific time selected for analysis.

The study utilized the Scopus database with the search criteria: "Leadership styles" AND "Employees" AND "Sustainable behavior" in the title, abstract, and keywords.

The analysis employed two tools. Initially, VOSviewer version 1.6.20 was utilized to examine keyword co-occurrences and co-authorship between countries. Next, Biblioshiny was employed to determine the most relevant sources in Scopus, and the author's production between 2019-2025.

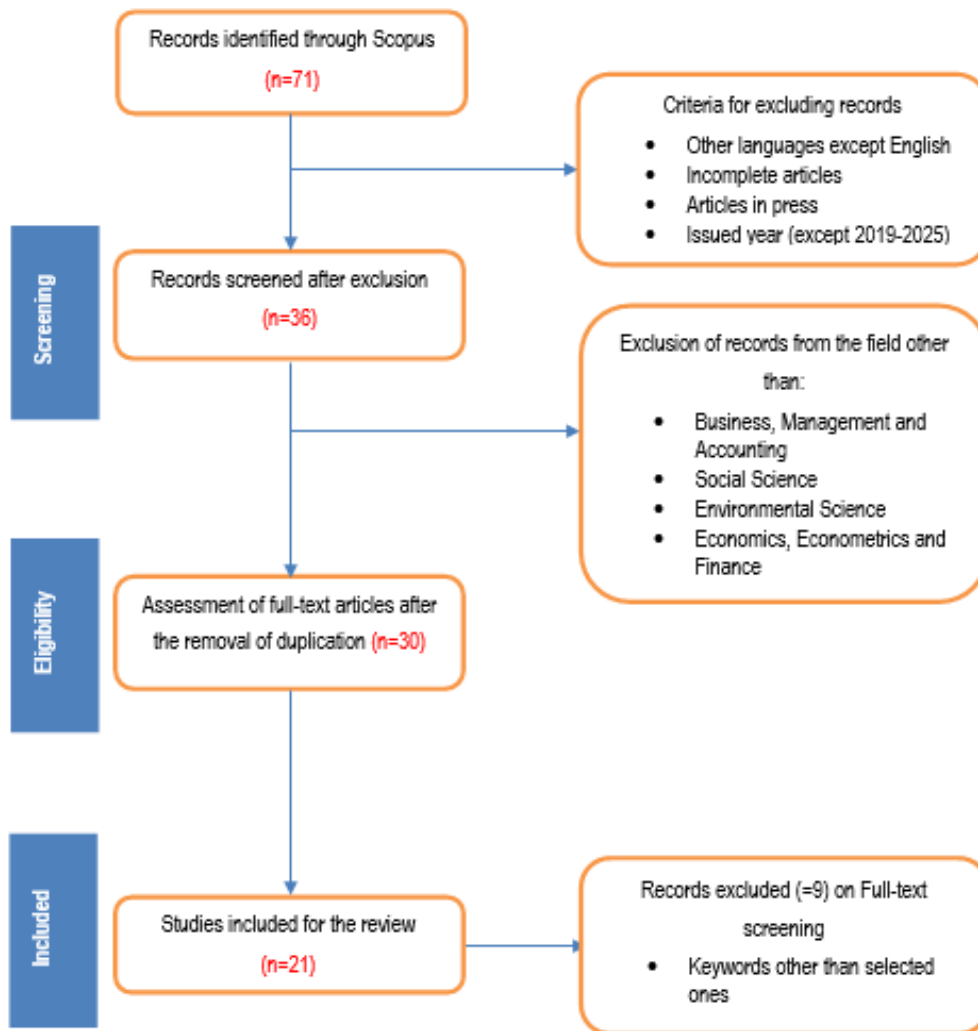


FIGURE 1. PRISMA FLOWCHART
Source: Adapted from Moher et al., 2009

4. RESULTS AND DISCUSSION

To create the co-occurrence keywords network map (Figure 2), the VOSviewer tool was configured with the following settings: the analysis type was „co-occurrence,” the analysis unit was „all keywords,” and the „full counting” method was applied. The minimum keyword occurrence was set at 2, yielding 23 items organized into 4 clusters, with 97 links and a total link strength of 139.

At the network's core, the term “leadership” demonstrates that it is serving as the primary hub, being the first cluster formed and showing its interconnection with a diverse array of research themes. This cluster includes keywords such as psychology, organizational behavior, workplace, morality, and servant leadership. The big circle of psychology emphasizes the foundational role of psychological theories in

leadership research. The green cluster, including keywords like employee performance, leadership style, and sustainability, reflects a substantial body of research investigating how different leadership styles influence individual and organizational performance outcomes.

The blue cluster demonstrates the increasing integration of sustainability discourses within leadership studies, particularly transformational leadership's role in driving environmental and sustainable practices. In the end, the yellow cluster highlights a modern research path that connects inclusive and sustainable leadership practices with innovation results, backed by empirical methods like regression analysis. Other studies match the results by identifying the same clusters focused on leadership, psychology, performance, sustainability, innovation, etc (Ribeiro et al., 2024; Khotob et al., 2024; da Silva Wegner et al., 2023).

To answer RQ 1, the analysis identified 23 keywords grouped into four clusters. The central keyword "leadership" connects with psychology, organizational behavior, workplace, morality, and servant leadership, showing leadership as the main research hub. Other clusters focus on employee performance and sustainability (green cluster), transformational leadership and environmental practices (blue cluster), and inclusive and innovative leadership approaches (yellow cluster). These clusters illustrate that current research integrates psychological, performance, and innovation dimensions of leadership and sustainability.

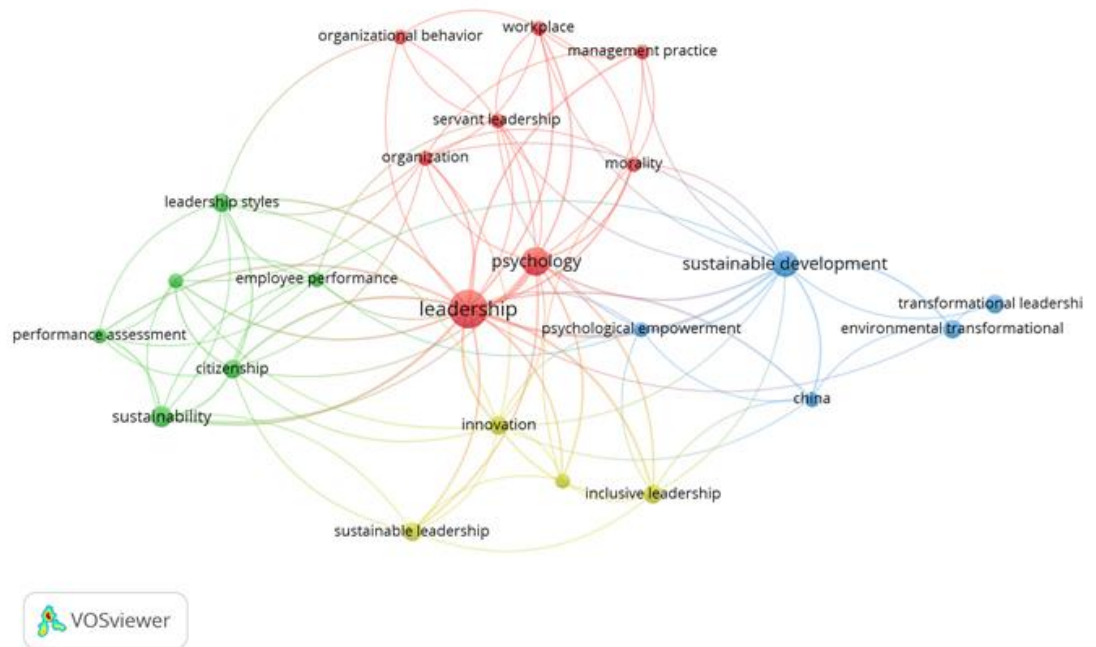


FIGURE 2. ALL KEYWORDS IN THE CO-OCCURRENCE NETWORK MAP

Source: VOSviewer

Each circle from Figure 3 represents a country, while the lines indicate collaborative relationships. The size of each node reflects the number of publications, and the thickness of the edges reflects the strength or frequency of collaboration. To create Figure 3 in VOSviewer, the authors used the following settings: the

type of analysis was “co-authorship”, using the “full counting” method, and the unit of analysis was “countries”. In addition, the minimum number of documents of a country was set to 1 and the minimum number of citations of a country was set to 1 as well, resulting in 14 countries.

China emerges as the most central and significant node in this network, indicating its substantial role in international collaboration within the field under study. The nations are categorized by colors, indicating collaboration clusters formed from co-authorship information. The blue cluster includes China and South Korea, indicating a strong East Asian research network, while the red one entails cooperation among the United Kingdom, Italy, and Brazil, highlighting cross-continental collaboration mainly between Europe and Latin America. The green cluster connects China with Pakistan and Romania, showing a less prominent but still meaningful collaborative link.

Countries like Romania, Pakistan, Brazil, and Italy seem smaller and less connected, indicating less international collaboration or specialized involvement. The map shows the structure and intensity of global academic collaboration, possibly reflecting geopolitical, linguistic, or thematic affinities. The strong link between China and the UK is notable, suggesting shared research agendas or funding. This visualization helps identify key research hubs, assess collaboration equity, and guide strategic decisions in international academic partnerships. The results are in line with the ones from Alka, Raman and Suresh (2024), highlighting countries like China, Italy and the UK as countries with high international co-authorship.

To answer RQ2, the co-authorship map, comprising 14 countries, highlights China as the most central and collaborative node, confirming its leading role in sustainability and leadership research. The blue cluster connects China and South Korea, showing strong East Asian collaboration. The red cluster links the United Kingdom, Italy, and Brazil, indicating cross-continental partnerships, while the green cluster connects China, Pakistan, and Romania, reflecting smaller but meaningful cooperation. These findings confirm that China and the UK act as global research hubs, with emerging contributions from Romania, Brazil, and Pakistan.

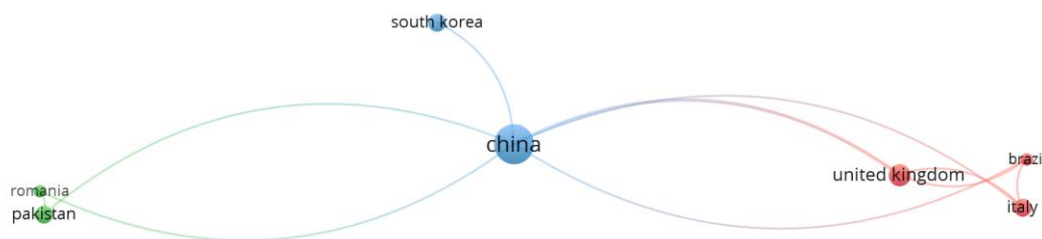


FIGURE 3. COUNTRIES CO-AUTHORSHIP
Source: VOSviewer

Figure 4 highlights the top ten most significant sources in Scopus for the leadership styles and sustainable behavior area. The journal with the most published papers is „Sustainability (Switzerland)” with 9 articles, followed by the „Journal of Environmental Protection and Ecology”. Sustainability (Switzerland) it is also remarked as the first relevant journal in Hallinger and Suriyankietkaew’s (2018) research.

To answer RQ3, the analysis reveals that “Sustainability (Switzerland)” is the most influential journal, publishing nine articles, followed by the “Journal of Environmental Protection and Ecology.” These journals consistently appear as the primary sources advancing leadership–sustainability research. Their prominence aligns with prior findings by Hallinger and Suriyankietkaew (2018), confirming that Sustainability (Switzerland) remains the central publication venue for sustainable leadership topics.

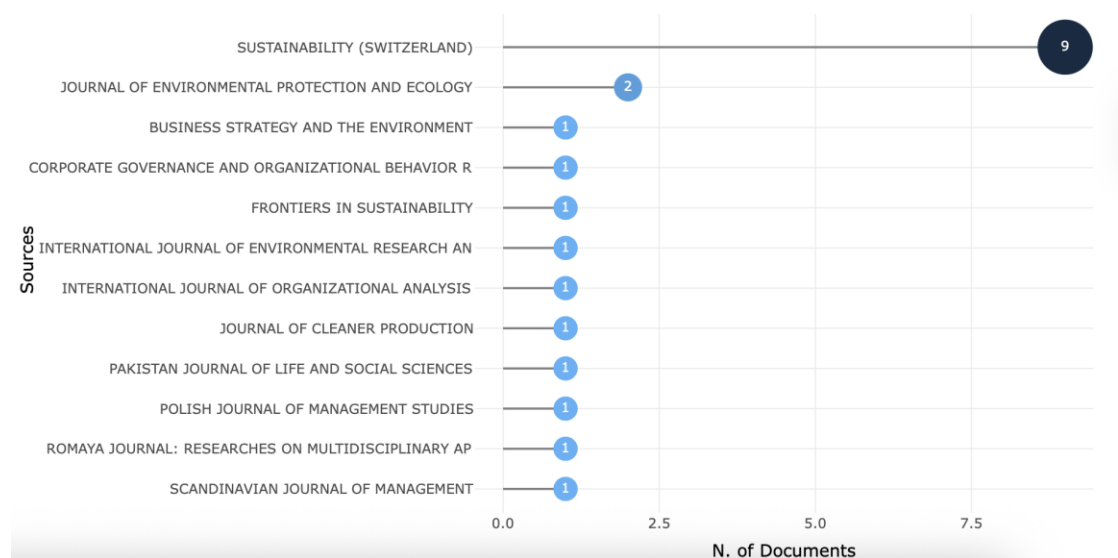


FIGURE 4. MOST RELEVANT SOURCES
Source: Biblioshiny

This scatter plot shows academic contributions by authors from 2022 to 2024. Each point represents a publication, with size and intensity possibly indicating impact or frequency.

Most contributions are in 2022 and 2024, with a gap in 2023, suggesting a data gap or reduced activity. Badulescu, Alina and Badulescu, Daniel consistently contribute in 2022 and 2024, showing ongoing engagement. Authors like Abdallah, Farid, Altassan, Megren Abdullah, and Baydoun, Hala only contribute in 2024, indicating recent entry or increased activity. The co-occurrence of authors with the same surname, like Badulescu, may suggest collaboration. Multiple contributions in 2024, especially by newer authors, could indicate growing research interest. If point size and color represent citation count or impact, Badulescu, Daniel and Abid, Ghulam have more influential publications, especially in 2024. This visualization highlights authorship trends, showing temporal shifts in output and variations in research influence, crucial for bibliometric reviews to identify prolific scholars and emerging contributors. You,

Awang and Wu (2024) also identified a significant increase in production after 2020, validating the presented results of publication rates in 2022 and 2024.

To answer RQ4, the scatter plot shows that research output peaks in 2022 and 2024, with a noticeable gap in 2023. Authors Badulescu, Alina and Badulescu, Daniel exhibit consistent productivity across multiple years, while Abid, Ghulam and Abdallah, Farid represent new emerging contributors in 2024. The increase in author activity during 2024 suggests a renewed research momentum and growing academic interest in leadership and sustainability themes.

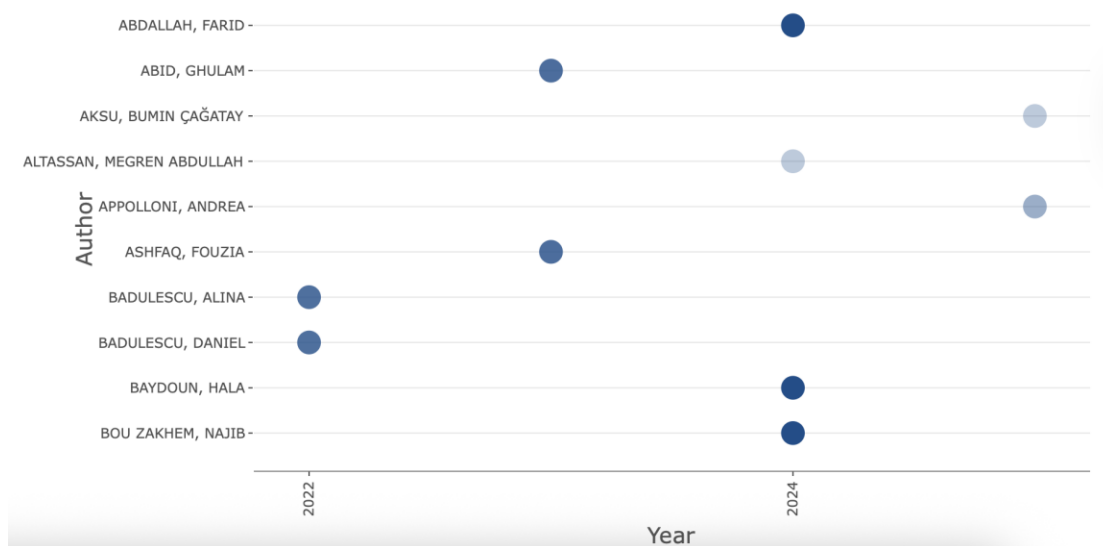


FIGURE 5. AUTHORS' PRODUCTION OVER TIME

Source: Biblioshiny

5. CONCLUSIONS

This bibliometric review demonstrates that leadership styles play a fundamental role in promoting employees' sustainable behavior, ultimately supporting organizational sustainability goals. Ethical, transformational, green, authentic, and participative leadership styles have been shown to foster pro-environmental behaviors by enhancing employee motivation, empowerment, and commitment to sustainability. In addition, the interplay between leadership and organizational enablers—such as green HR practices, procedural justice, and effective communication—significantly amplifies leadership's impact. The analysis also reveals that countries like China, the UK, and South Korea are prominent research hubs, and that journals such as *Sustainability* (Switzerland) serve as major publication venues for this topic. Despite these advances, there remain important research gaps, including a limited exploration of hybrid

leadership models and the long-term stability of green behaviors over time. Future studies should consider longitudinal research designs and deeper integration of organizational systems to understand how leadership styles can sustain employee engagement with green initiatives across diverse cultural and sectoral contexts.

Overall, these findings contribute to both theoretical understanding and practical insights on leveraging leadership to drive sustainable transformation in organizations. By fostering an inclusive, ethical, and future-oriented leadership culture, organizations can more effectively engage their employees as partners in achieving long-term environmental and social sustainability.

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