

A Bibliometric Analysis of Ecological Leadership and Organizational Adaptability Based on the Web of Science (WOS) Platform

Ms. R.Baquia Latchoumy, Assistant Professor , M.O.P Vaishnav College for Women

Ms. N. Priyadharsini , Student, II M.A HRM, M.O.P Vaishnav College for Women

ABSTRACT

This bibliographic study systematically examines Ecological leadership and organisational adaptability have gained prominence as vital paradigms for advancing sustainable business practices, resilience, and competitiveness in the face of global challenges. The analysis highlights current research trends, theoretical stances, and research gaps in this interdisciplinary field by consulting academic publications, journals and scholarly papers. It examines comprehensive bibliometric analysis of 680 publications indexed in the Web of Science database between 2005 and 2025. Using VOSviewer and Biblioshiny, the research maps intellectual structures, uncovers thematic clusters, and traces the evolution of scholarship in this domain. Citation, co-citation, and co-occurrence analyses were applied to evaluate scientific contributions, examining variables such as keywords, authors, journals, institutions, and countries. The findings reveal an increasing convergence between ecological leadership and organisational adaptability, with significant emphasis on strategic renewal, innovation, sustainability integration, and stakeholder engagement. The study ends with suggestions for additional empirical research to clarify the gendered aspects of ecological leadership in promoting agility in modern organizational settings.

Keywords: Organizational Adaptability, Ecological leadership, Sustainability, Bibliometric analysis, VOSviewer, Web of Science

INTRODUCTION

A critical ecological threshold has been reached by humanity. Climate change, biodiversity loss, and resource depletion are not only environmental issues; they are also crises of leadership, governance, and institutional resilience. Organizations nowadays are expected to become stewards of sustainable development, able to change with and contribute to planetary boundaries, after initially being created to optimize short-term profits and efficiency. After being neglected for a long time, ecological sustainability is now a priority.

The ability of a firm to recognize, comprehend, and react effectively to new threats and opportunities, whether they are caused by climate risks, market volatility, technological disruptions, or changing regulatory frameworks is known as organizational adaptability. Ecological leadership and organizational adaptability have become increasingly important indicators of sustainable organizational survival. By incorporating ethical accountability, environmental stewardship, and systems thinking into decision-making processes, ecological leadership transcends traditional leadership paradigms and makes sure that an organization's expansion is consistent with the preservation of natural ecosystems.

The junction of these two domains is becoming more and more recognized as a route for gaining both ecological resilience and a competitive edge, with leaders serving as drivers for incorporating environmental considerations into adaptive plans. These notions collectively emphasize the need for leaders who can integrate ecological priorities into adaptive decision-making, promote innovation, and protect the environment and society. By analyzing the trends, thematic directions, and conceptual advancements in this field, the current research offers a clearer picture of how leadership focused on sustainability can improve a company's ability to deal with complexity and change.

METHODOLOGY

The research is carried out through Bibliometric analysis which assesses the trends in research, Predictive concepts shaping the intellectual advancements in the field. This analysis helps to analyze the research gap and elicit new insights.

Research Framework

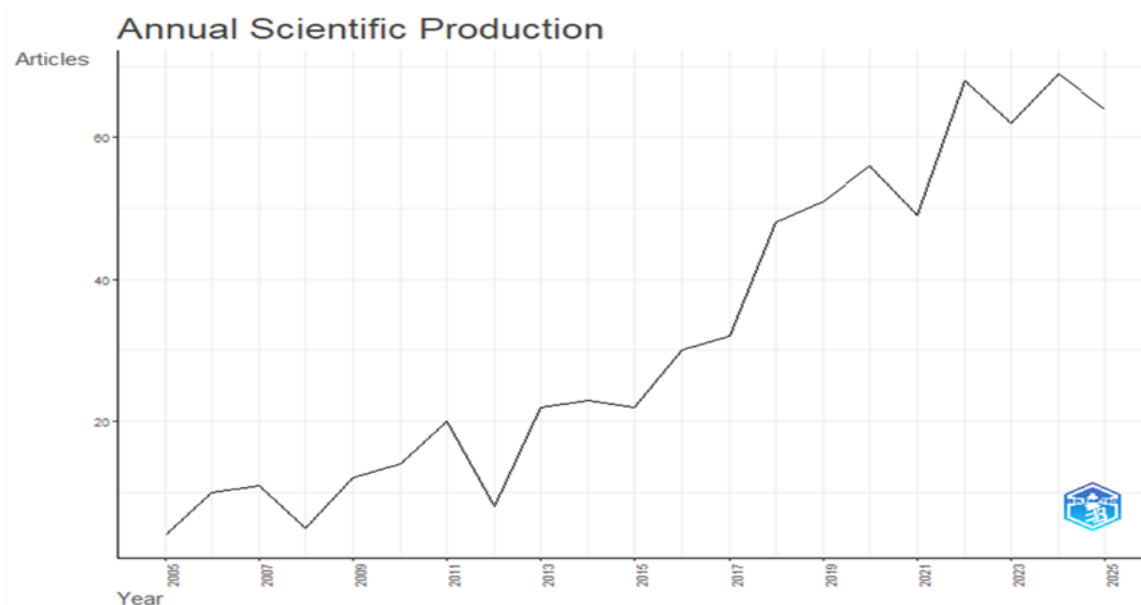
VOSviewer, a Java-based software developed by van Eck and Waltman in 2009, is widely used for conducting bibliometric analysis (van Eck & Waltman, 2010, 2014). It focuses on document data and builds relationships and analyzes document units visually using "Network data." To illustrate the organization, development, and collaboration within a field of knowledge, the program can generate scientific knowledge graphs (Van Eck and Waltman 2010, 2014). It provides a variety of visual representations, such as network visualization, overlay visualization, and item density visualization. VOSviewer finds study themes and their connections by examining keyword co-occurrence, creating clusters that reflect the most recent research topics (Van Eck and Waltman 2010, 2014).

Research data mapping

The mapping application used in this research digitally is VOSviewer to visualize the co-occurrence of the data. Bibliometric techniques such as citation, co-citation, co-occurrence, and co-authorship analyses were applied to the data. Data analysis and visualization were performed using VOSviewer and Biblioshiny, enabling the mapping of keyword networks, author collaborations, and citation linkages.

RESULTS AND DISCUSSIONS

It was observed that the topic of **ecological leadership and organizational adaptability** started to attract attention between **2007 and 2010**, with a modest but steady number of studies during this period. After 2010, research activity grew gradually, with a rise in academic interest in the subject. A significant increase can be seen from **2016 onwards**, with a strong upward trend continuing into recent years. The highest number of studies was recorded in **2024 with 69 publications**, followed closely by **2022 (68 studies)** and **2025 (64 studies)**, showing that the field is gaining momentum.



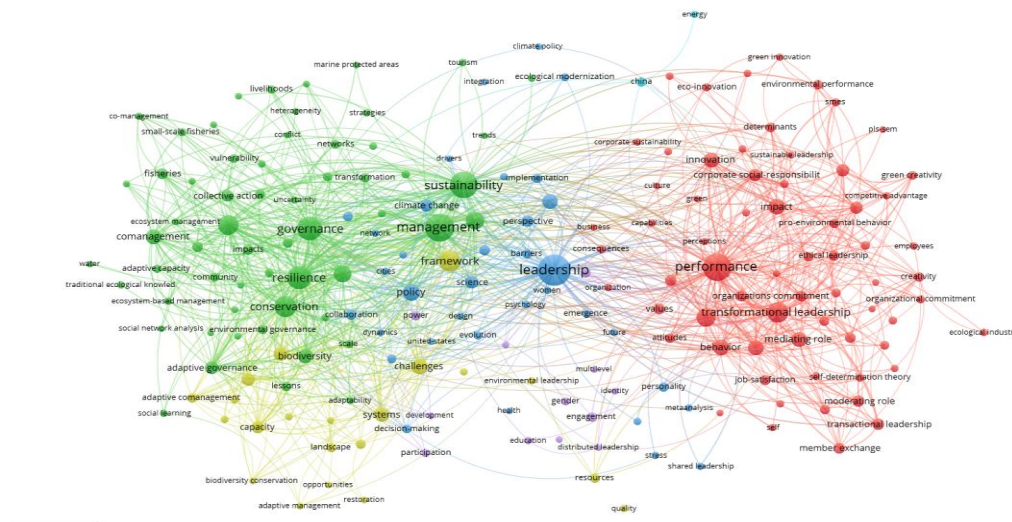
Notably, the publications of the **last five years (2021–2025)** account for around **46% of all studies**, highlighting the growing recognition of ecological leadership as a critical factor for enhancing organizational adaptability.

Table 1 : The distribution of publications by year

Year of Publications	No .of Publications	Year of Publications	No .of Publications
2005	4	2015	22
2006	10	2016	30
2007	11	2017	32
2008	5	2018	48
2009	12	2019	51
2010	14	2020	56
2011	20	2021	49
2012	8	2022	68
2013	22	2023	62
2014	23	2025	64

Figure 1: Co-occurrence of Keywords

The keyword analysis revealed that “leadership” (108), “management” (84), “performance” (82), and “sustainability” (78) were the most frequently occurring terms, underscoring their central role in research on ecological leadership and organizational adaptability. Other prominent concepts included “governance” (62), “resilience” (57), and “social-ecological systems” (43), reflecting the



systemic and environmental dimensions of the field. Leadership acts as the central link between ecological governance and organizational adaptability. Transformational and transactional leadership directly influence performance, commitment, and innovation, highlighting leadership style as a driver of adaptability. Strong co-occurrence among sustainability, management, and governance indicates that sustainable ecological leadership fosters organizational resilience and adaptive capacity.

Figure 2: Co-authorship of countries

The study identified 95 contributing countries, with the USA leading (668 publications; 55,406 citations) and strong networks linking Europe, Canada, Australia, and China. While the USA dominates in impact, China's rapid growth and India's emerging contribution highlight a shift toward multi-regional collaboration.

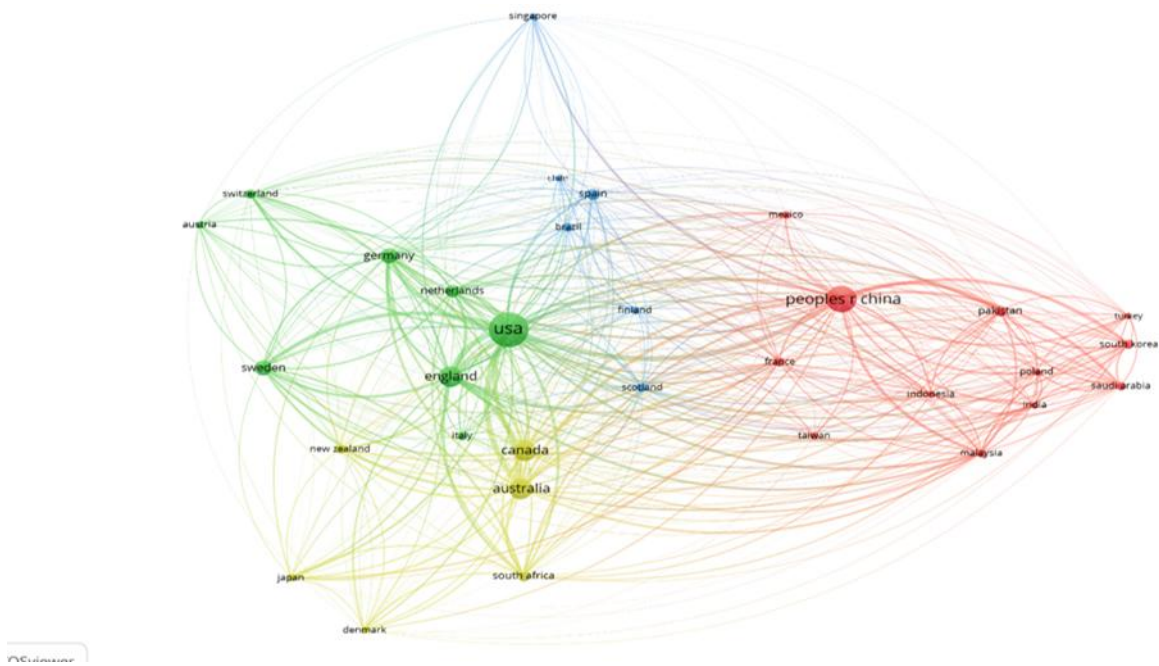


Figure 3: Bibliographic coupling of documents

Bibliometric coupling of documents shows clusters around sustainability leadership, ecological governance, and organizational strategy. Highly coupled documents, such as those by Bansal, Boiral, and Teece, indicate shared references that bridge business strategy and environmental responsibility. Another set of tightly linked works by Ostrom and Bodin emphasize common grounding in ecological systems and governance. This demonstrates that leadership and sustainability research is built on overlapping intellectual foundations that connect business strategy with ecological resilience.

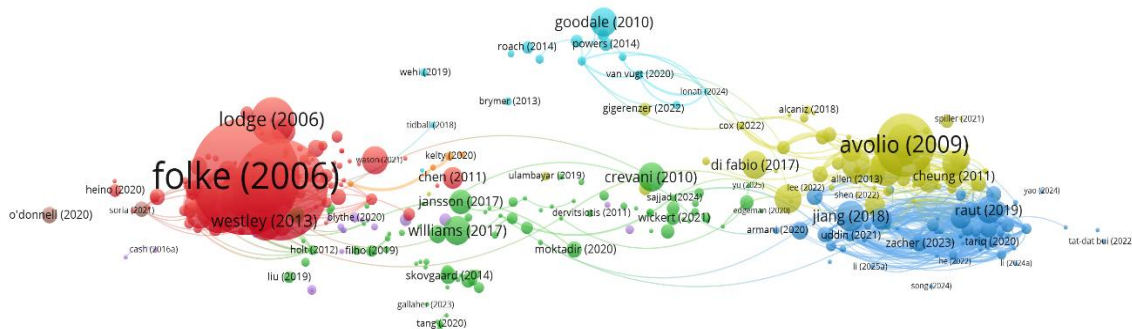


Figure 4: Co citation of Sources

The co-citation clusters dominated by Journal of Cleaner Production, Business Strategy and the Environment, and Ecological Economics indicate that the research community emphasizes sustainability, strategic responses, and environmental policy. This aligns directly with ecological leadership, as leaders are expected to integrate environmental consciousness into strategy. At the same time, the presence of journals linking management with environmental change underscores organizational adaptability, showing how firms must adjust their structures, cultures, and practices to remain resilient under ecological and sustainability pressures.

Between 2005 and 2025, research on ecological leadership and organizational adaptability showed strong growth with a 14.87% annual increase, reflecting rising interest and relevance. With 680 documents and 2,878 authors contributing, the field is highly collaborative, evidenced by a 38.38% international co-authorship rate and an average of 4.42 co-authors per paper. The topic's robust citation impact, averaging 54.18 citations per document, highlights its influence and importance in advancing knowledge on adaptive and sustainable leadership in ecological contexts

Figure 7: Mapping the Relationship between Cited References, Authors, and Keywords

This Sankey diagram from Biblioshiny illustrates the interconnections among cited references, authors, and central themes in ecological leadership and organizational adaptability research. Foundational scholars such as Folke and Ostrom are shown to anchor key topics including resilience, governance, management, and sustainability. The diagram underscores how ecological perspectives are integrated with organizational leadership, highlighting adaptive capacity and innovation. Core themes like social-ecological systems and climate change situate the discourse within its environmental context. Overall, the visualization reveals the interdisciplinary linkages shaping the intellectual structure of the field.

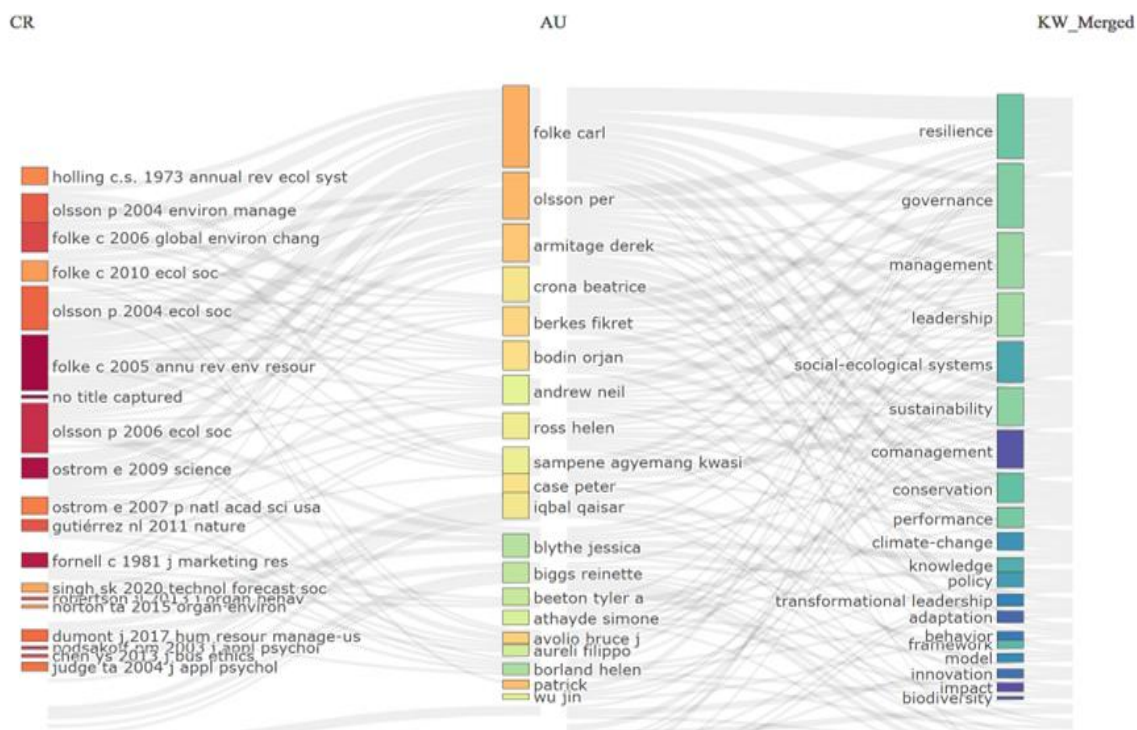


Figure 8: Cluster by documents coupling

Ecological leadership emerges as a central theme within the network visualization, showing strong linkages with sustainability and adaptability research. High centrality keywords emphasize its pivotal role in guiding organizational responses to environmental and social challenges. The impact, reflected through citation strength, underscores its contribution to enhancing organizational adaptability and resilience.

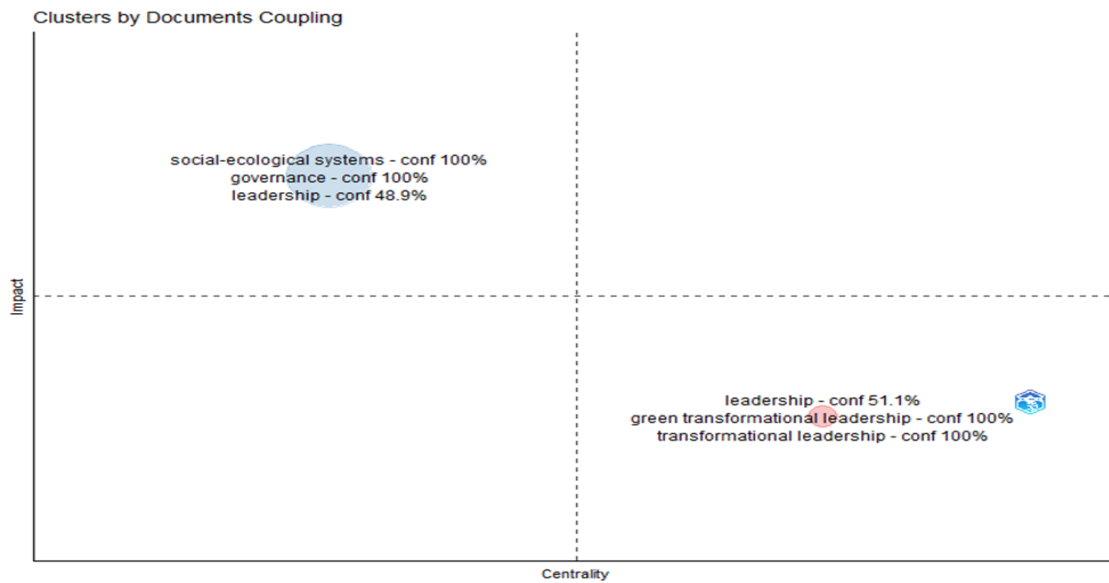


Table 2 : The sources of Data

Source	h_ndex	gindex	mindex	TC	NP
ECOLOGY AND SOCIETY	29	50	1.45	3863	50
SUSTAINABILITY	21	37	1.5	1489	68
FRONTIERS IN PSYCHOLOGY	12	20	1.333	764	20
ENVIRONMENTAL SCIENCE \& POLICY	10	14	0.667	594	14
JOURNAL OF CLEANER PRODUCTION	9	14	0.474	1328	14
JOURNAL OF ENVIRONMENTAL MANAGEMENT	9	15	0.529	378	15
LEADERSHIP QUARTERLY	9	11	0.45	1130	11
MARINE POLICY	9	15	0.563	242	15
LAND USE POLICY	8	9	0.8	272	9
LANDSCAPE AND URBAN PLANNING	8	8	0.533	338	8

CONCLUSION

The most cited studies in ecological leadership and organizational adaptability were identified by examining bibliometric linkages across publications, reflecting the intellectual base and research trends in this domain. The aim of this bibliographic analysis was to build a systematic and holistic understanding of how ecological leadership contributes to organizational adaptability. The study serves two purposes , first, to assess the quantitative strength of the field through publication growth, citation impact, and keyword prominence; and second, to explore qualitative linkages among authors, institutions, and thematic areas. The findings indicate that ecological leadership drives organizational transformation by enhancing resilience, embedding sustainability practices, and strengthening adaptability in dynamic environments.

The findings highlight leadership as a central managerial and systemic element in shaping organizational adaptive capacity, particularly in relation to business strategy and environmental governance. Ecological leadership strongly influences performance, innovation, sustainability adoption, and resilience—factors vital for long-term survival under ecological pressures. Its frequent association with transformational leadership further shows that ecological leadership underpins transformational practices.

The bibliometric analysis further highlights the rapid growth of scholarship in recent years, underscoring an expanding academic interest in ecological leadership. It has also been found that influential and impactful contributions are concentrated in countries such as the USA, Canada, and Europe, while contributions from Asia, including India, are

emerging with ecological perspectives. As the field expands, the role of ecological leadership in enhancing organizational adaptability will become more evident, offering both qualitative and quantitative insights for future research.

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