Green leadership and pro environmental behavior in the public sector: Systematic literature review using PRISMA

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Article History
Received: 30 May 2026
Revised: 18 July 2026
Accepted: 2 August 2026
Published: 1 September 2026

Keywords
Green leadership
Organizational citizenship behavior for the environment
Pro environmental behavior
Public sector
Systematic literature review

Abstract
Environmental sustainability is critical in the public sector, yet adoption of pro environmental behavior (PEB), particularly Organizational Citizenship Behavior for the Environment (OCBE), among public servants remains inconsistent Prior studies on green leadership in the public sector are fragmented, geographically limited, and micro focused, offering little integration with organizational, structural, and institutional governance dimensions. Crucially, the novelty of this review lies in its exclusive public sector synthesis, integrating individual, organizational, and institutional governance dimensions into a holistic multi-level framework absent in prior systematic reviews. This study systematically reviews the literature on green leadership's role in promoting PEB and OCBE within public sector organizations. A Systematic Literature Review (SLR) followed the PRISMA 2020 guidelines. Articles were sourced from Scopus indexed journals, screened for eligibility and thematically analyzed. Seventeen high-quality studies met inclusion criteria and were analyzed to identify key mechanisms, theoretical perspectives, and research trends. Findings indicate green leadership consistently drives PEB and OCBE among public employees. Its influence is mediated by environmental value internalization, leadership role modeling, green organizational culture, green HRM, and individual psychological factors such as environmental self-efficacy. Thus, green leadership functions a as both a normative leadership style and a managerial instrument for sustainability behavior and performance in bureaucracies. Theoretically, it positions green leadership as a multidimensional adaptive framework enriching public sector leadership and OB literature. Practically, it underscores institutional and policy support to embed sustainability values into public sector systems, while identifying research gaps such as longitudinal, cross level, and contextually diverse studies.

How to cite: Pratiwi, M. N., Prihanto, J. B., Warju, W., Raharja, W. T., & Ibrahim, A. Z. (2026). Green leadership and pro environmental behavior in the public sector: Systematic literature review using PRISMA. *Journal of Environment and Sustainability Education, 4*(3). 561–574. doi: 10.62672/joease.v4i3.304

1. Introduction

The issues of climate change and environmental degradation have prompted the public sector to take on an increasingly strategic role in realizing sustainable development (Erna & Mutaqin, 2023). The government acts not only as a formulator of environmental policy but also as a public organization whose operational activities contribute directly to energy consumption, resource use, and waste production (Knill & Steinebach, 2023). Therefore, environmental sustainability in the public sector is highly dependent on the behavior of government employees in carrying out their daily tasks. Simple work practices such as energy conservation, reduction of paper use, and office waste management are forms of pro environmental behavior (PEB) that have real implications for the environmental performance of government organizations (Ke et al., 2025).

PEB in organizations has become a major focus in organizational behavior and public administration studies as sustainability demands increase. PEB refers to individual actions aimed at reducing negative impacts on the environment and supporting ecological sustainability (Bisla et al., 2024). In the organizational context, PEB encompasses not only formally required behavior (in role behavior) but also voluntary behavior that goes beyond job requirements. The concept of OCBE (Wu et al., 2025) was then developed to explain the voluntary contributions of employees in supporting the environmental performance of organizations, such as proposing green initiatives, helping colleagues implement environmentally friendly practices, and maintaining resource efficiency (Gull et al., 2024).

doi: 10.62672/joease.v4i3.304
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ISSN: 3025-0714

Empirical research over the past decade shows that OCBE contributes significantly to organizational environmental performance. Cross sector studies have found that voluntary employee behavior plays an important role in reducing energy consumption, reducing waste, and increasing the effectiveness of internal organizational environmental policies (Azhar & Yang, 2022). The literature also confirms that OCBE cannot be enforced through regulation alone, but rather develops through the internalization of values and social support within the organization (Daily et al., 2009). These findings indicate that structural and leadership approaches are crucial in promoting sustainable PEB. These findings underscore the need for structural and leadership interventions to foster sustained PEB.

In response to this need, green leadership crystallized as an approach that integrates sustainability values into vision, behavior, and managerial practices. Recent research identifies green transformational leadership as an effective form of leadership in promoting employee PEB. Environmentally oriented leaders not only set environmental goals but also act as role models, provide resource support, and inspire subordinates to contribute to organizational sustainability (Oktaysoy et al., 2025). A number of empirical studies show that green transformational leadership has a direct effect on employee Environmental Sustainable Behavior (ESB) and an indirect effect through mediators such as green intrinsic motivation, environmental awareness, and green organizational identity (Liao, 2024).

This study is anchored in three complementary theoretical perspectives. The Theory of Planned Behavior (TPB) posits that individual behavior is influenced by attitudes toward the behavior, subjective norms, and perceived behavioral control (Yuriev et al., 2020). With leadership playing a key role in shaping these three components (Khotob et al., 2024). SET provides a relational explanation emphasizing that leaders-subordinates relationships built on trust and support (Musleh & Cross, 2025). elicit positive employees, responses including OCBE (Jameel et al., 2023). Green leadership itself functions as a normative and managerial framework that embeds sustainability into leadership practices (Oktaysoy et al., 2025).

The literature gap can be identified from two interrelated issue. Although the relationship between green leadership and employee EBP has been extensively studied, most research still focuses on the private sector, such as manufacturing and hospitality. Studies in the public sector are relatively limited and tend to place employee EBP as a result of compliance with formal policies, rather than as voluntary behavior influenced by leadership and organizational social dynamics (Yu et al., 2024). In fact, the public sector has distinctive characteristics, including a strong hierarchical structure, strict bureaucratic regulations, and the existence of public service motivation, which can moderate the influence of leadership on individual behavior (Azhar & Yang, 2022)

Several early studies in public organizations show that leadership support and an environmentally friendly organizational culture can increase employee engagement in environmental initiatives. However, the theoretical mechanisms explaining how green leadership shapes employee attitudes, norms, and social relationships have not yet been comprehensively explained. Thus, there is a clear need to integrate the perspectives of green leadership, TPB, SET, and OCBE in the context of public administration.

Based on this state of the art, this study positions green leadership as a key mechanism that bridges sustainability policies and employee EBP in local government bureaucracies. To address the identified gap, this study proposes a novel cross-theoretical integration that combines Green Leadership, Theory of Planned Behavior (TPB), Social Exchange Theory (SET), Organisational Citizenship Behavior for the Environment (OCBE), and Green Policy within a single analytical framework. However, the manuscript acknowledges that claims of novelty require explicit verification. Unlike previous systematic reviews that have largely examined these constructs in isolation or focused predominantly on private sector settings, a comprehensive review comparing the present study's integrative framework with prior empirical studies and systematic reviews reveals that no prior synthesis has specifically examined the simultaneous interplay of these five elements within local government bureaucracies. Therefore, this integration constitutes a genuinely new contribution. This cross theoretical integration is expected to broaden the theoretical understanding of organizational behavior in the public sector and provide a conceptual basis for the development of environmentally conscious leadership that supports sustainable bureaucratic reform.

Furthermore, In the context of the public sector, the influence of green leadership on employee PEB cannot be separated from the role of environmentally conscious organizational policies (green policies) as institutional instruments. Leaders with a green leadership orientation have a strategic position in translating environmental values and commitments into formal policies, work procedures, and operational standards that guide employee behavior. In this case, green policy does not function as an independent determinant of behavior, but rather as a mechanism that reinforces the normative message of leadership, shapes subjective organizational norms, and provides a structural framework that facilitates the emergence of PEB and OCBE. Thus, environmental policy becomes an important medium through which the influence of green leadership is institutionalized and normalized in bureaucratic work practices, without eliminating the voluntary nature of PEB. This perspective enriches our understanding of how green leadership operates effectively in a rule based bureaucratic

environment, while also emphasizing that public policy can function as a lever for PEB when it is aligned with leadership values and examples.

Based on this novelty, the research problem is formulated as follows: how does green leadership influence employee PEB in local government bureaucracy, and through what mechanisms, particularly through the role of green policy, is this influence formed and exercised? This question aims to reveal the dynamics of leadership, policy, and employee behavior in the context of public administration, which has distinctive structural and normative characteristics.

Thus, this study aims to systematically review the role of green leadership in shaping employee PEB within the public sector, by positioning green policy as an institutional mechanism that mediates leadership influence. The Systematic Literature Review (SLR) approach is chosen as the most appropriate method for this study because it provides a rigorous, transparent, and replicable framework for synthesizing fragmented empirical evidence drawn from diverse disciplinary contexts, thereby enabling the identification of underlying theoretical mechanisms, contextual moderators, and research gaps that individual empirical studies cannot comprehensively address. By synthesizing the extant literature, this review formulates theoretical contributions and practical implications for bureaucratic reform, sustainable public policy, and the development of environmentally conscious leadership in government.

2. Method

This study uses a Systematic Literature Review (SLR) approach to comprehensively analyze the role of green leadership in shaping PEB in the public sector. The SLR approach was chosen because it allows researchers to identify, evaluate, and synthesize empirical findings from scientific literature in a systematic and transparent manner, resulting in a strong, evidence based conceptual understanding (Ayad & Hasanein, 2025). The SLR process in this study follows the Preferred Reporting Items for Systematic Reviews and Meta Analyses (PRISMA) guidelines to ensure accuracy, replicability, and transparency in the literature selection process (Mishra & Mishra, 2023). The PRISMA stages include identification, screening, eligibility determination, and inclusion of articles relevant to the focus of the study.

2.1. Search Strategy

The literature search was conducted exclusively using the Scopus database, leveraging its Scopus AI-powered search capabilities to enhance precision and relevance in document retrieval. Scopus was chosen as the sole database based on several scientific rationales: (1) it is widely recognized as the largest and most comprehensive abstract and citation database of peer-reviewed literature, covering a broad range of disciplines including social sciences, management, and public administration; (2) its advanced AI-driven search features enable more intelligent keyword matching, context-aware retrieval, and semantic search capabilities that are particularly valuable for interdisciplinary topics such as green leadership and pro-environmental behavior; (3) Scopus provides consistent and reliable metadata, citation tracking, and journal quality indicators (e.g., CiteScore, SJR) that facilitate rigorous screening and quality assessment; and (4) methodological studies have demonstrated that Scopus alone can capture a sufficiently representative and high-quality sample of literature for systematic reviews in the management and organizational behavior fields, especially when combined with a well-constructed search strategy (Mongeon & Paul-Hus, 2016; Waltman, 2016). While a single-database approach may introduce some coverage bias, the comprehensiveness of Scopus and the enhanced capabilities of Scopus AI mitigate this risk by ensuring broad and relevant document retrieval.

To ensure reproducibility, the search was performed specifically within the TITLE-ABS-KEY search fields. The complete search string applied was: TITLE-ABS-KEY(("green leadership" OR "green transformational leadership") AND ("pro environmental behavior" OR "organizational citizenship behavior for the environment") AND ("public sector" OR "public administration")).The keywords used were systematically compiled and combined using Boolean operators(OR and AND). The search was limited to articles published in the last ten years (2015–2025) to ensure scientific relevance and novelty, with the exception of classical basic theories. Furthermore, a language restriction was imposed, limiting the results to articles published in English.

2.2. Inclusion and Exclusion Criteria

The inclusion criteria in this study included: peer-reviewed scientific journal articles, discussing green leadership and/or PEB in an organizational context, using a clear empirical or conceptual approach, and available in full text and open access. Meanwhile, exclusion criteria include: non-journal articles (popular books, opinions, unreviewed proceedings), duplicate publications, articles that are irrelevant to the context of leadership or organizational behavior, and articles that do not discuss the public sector or do not provide relevant conceptual implications for public administration.

Regarding the open access restriction, this was a pragmatic necessity to ensure full-text availability for detailed analysis, as institutional access to subscription-based content was limited. This restriction was applied

only after the screening process and was necessary to obtain complete manuscripts for in-depth thematic analysis. While this may introduce a potential bias toward studies published in open-access outlets, we acknowledge that open-access journals are increasingly prevalent and have been shown to achieve comparable quality standards to subscription-based journals (Piwowar et al., 2018). Furthermore, many open-access journals indexed in Scopus maintain rigorous peer-review processes and high citation impact, reducing the risk of quality-related bias. This limitation is explicitly noted as a potential constraint on the generalizability of our findings and should be considered when interpreting the results.

2.3. Screening Process

The selection process was carried out in several stages. In the identification stage, a number of articles were collected from the specified database. Next, the screening stage was carried out by reviewing the titles and abstracts to remove duplicate and irrelevant articles. Articles that passed this stage were then assessed for suitability through full text screening. Articles that met all inclusion criteria were then entered into the final stage for in depth analysis and synthesis.

Following the full-text screening, a quality appraisal (or risk of bias) assessment was conducted for all articles that met the inclusion criteria. This was performed using a standardized checklist adapted from the Joanna Briggs Institute (JBI) Critical Appraisal Checklist for cross-sectional, correlational, and qualitative studies, which assessed methodological quality and risk of bias across key domains including: (1) clarity of research objectives and study design; (2) appropriateness of sampling and data collection methods; (3) rigor of data analysis and interpretation; (4) transparency in reporting findings; and (5) validity of conclusions drawn relative to the evidence presented. Each article was independently rated by two reviewers to minimize subjective bias, with disagreements resolved through discussion or consultation with a third reviewer. Studies were not excluded based on this appraisal but were categorized as having low, moderate, or high methodological quality to inform the weight given to their findings during the thematic synthesis. This process ensured that the subsequent conceptual framework was built on a foundation of methodologically sound evidence (Munn et al., 2018).

The selected articles were analyzed using qualitative thematic analysis to identify patterns, themes, and conceptual relationships that emerged (Mason & Francis, 2022). The analysis focused on:

a. the characteristics of green leadership,

b. the mechanisms of PEB and OCBE formation,

c. the integration of green leadership theory, TPB, and SET, and

d. the implications of green leadership in the context of the public sector.

The results of the analysis were then synthesized to construct a conceptual framework that explains the relationship between green leadership and employee PEB in local government bureaucracy. As shown in Figure 1, the process of identifying, screening, assessing eligibility, and including studies was carried out systematically with reference to the PRISMA 2020 framework to ensure transparency and methodological accuracy.

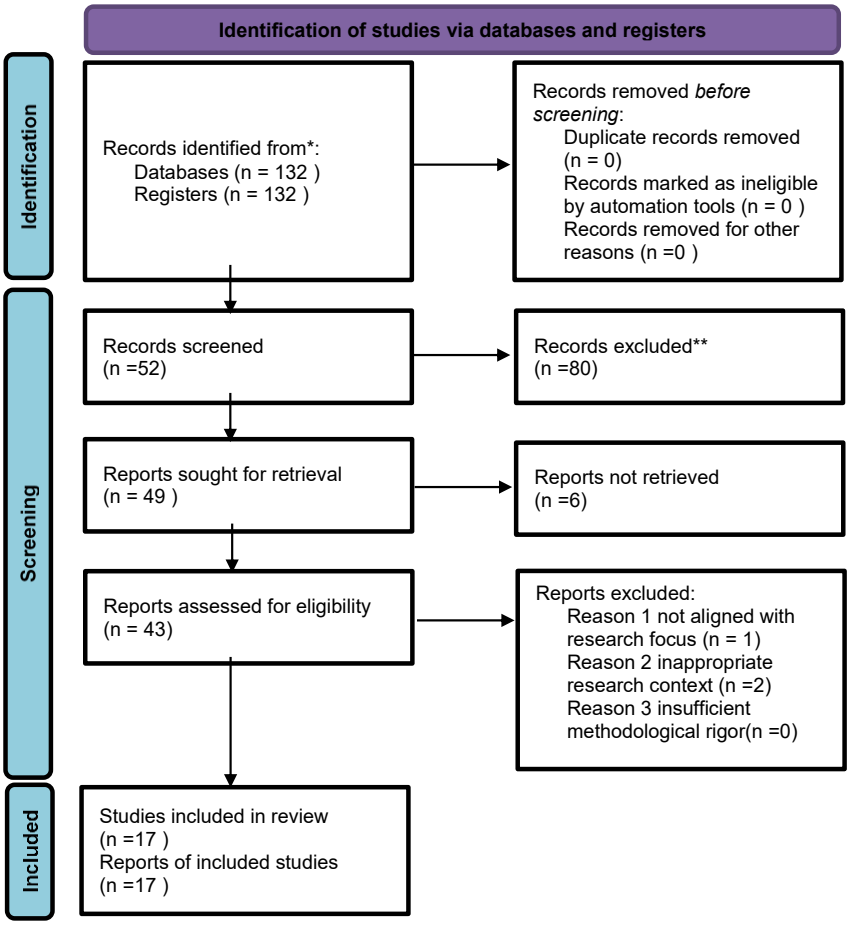

Figure 1. process of identifying, screening, assessing eligibility, and including studies was carried out systematically with reference to the PRISMA 2020

2.4. Data Analysis

The selected articles were analyzed using qualitative thematic analysis to identify patterns, themes, and conceptual relationships that emerged (Mason & Francis, 2022). To make the process more explicit, data extraction was performed using a standardized matrix to capture key information from each article including author, year, research context, methodology, specific green leadership dimensions, PEB/OCBE constructs, and theoretical grounds. The thematic synthesis then followed a transparent, multi-stage procedure: (1) open coding of the extracted data to generate initial concepts; (2) clustering these concepts into descriptive themes through constant comparison; and (3) interpreting and refining these themes through iterative dialogue with the original texts and the TPB/SET frameworks to formulate final analytical themes. The analysis focused on: (1) the characteristics of green leadership, (2) the mechanisms of PEB and OCBE formation, (3) the integration of green leadership theory, TPB, and SET, and (4) the implications of green leadership in the context of the public sector. The results of the analysis were then synthesized using cross-case synthesis and team debriefing to construct a conceptual framework that explains the relationship between green leadership and employee PEB in local government bureaucracy.

3. Results and Discussion

The Systematic Literature Review (SLR) process was conducted following the PRISMA 2020 guidelines to ensure transparency and replicability of study selection (Carter Templeton et al., 2025). The researchers applied a phased search strategy to identify relevant studies. The first stage was a sensitive search using a combination of keywords related to green leadership (environmental leadership, green leadership, sustainable leadership, eco leadership) and keywords related to PEB (behavior, pro environmental, environmental citizenship, OCBE, green practice) in the Scopus database. The purpose of this stage was to collect all potential studies discussing the relationship between leadership and behavior, including studies conducted in the private sector.

The second stage is a screening process based on the PRISMA protocol. At this stage, studies are assessed using strict inclusion criteria. Studies will be excluded if: (1) the research context is not in the public sector (e.g., corporate/private companies), (2) the unit of analysis is not at the organizational level (e.g., studies at the

individual or community level), or (3) the dependent variable measured is not actual behavior (e.g., only measuring attitudes or intentions).

The third stage was conducted to focus the results. After a broad search in Phase 1, the researchers filtered the results by adding public sector specific keywords (public sector, government, public administration, civil service) using the "Search within results" feature. This filter ensured that only studies that explicitly mentioned the public sector context were considered.

This phased strategy is superior to a direct search that combines all three concepts at once (e.g., "green leadership" AND "pro environmental behavior" AND "public sector"). Such a direct search risks producing very few documents due to its high specificity. These risks include: (1) missing studies that discuss similar topics but use different terminology, (2) ignoring comparative studies between the public and private sectors, and (3) missing studies with mixed samples that have strong implications for the public sector. Thus, the step by step strategy maximizes the comprehensiveness of study identification before rigorous screening is performed.

Researchers identified and screened documents through five systematic stages. The first stage (n_0) successfully collected 132 documents from the initial search. The second stage (n_1) screened based on inclusion criteria, resulting in 52 documents. The third stage (n_2) applied publication year restrictions (2015-2025), leaving 49 documents. The fourth stage (n_3) filtered based on document type and only retained journal articles, reducing the number to 43 documents. The fifth stage (n_4) limited the documents to those with open access status, which ultimately resulted in 17 documents (n_5) ready for further analysis in this study. Following the quality appraisal procedure described in Section 2.3, these 17 articles were assessed for methodological quality. The assessment revealed that 10 articles were of high quality, 5 were of moderate quality, and 2 were of low quality. All 17 articles were retained for thematic synthesis, with findings from higher-quality studies given greater weight in the development of the conceptual framework.

These findings indicate that although green leadership studies have developed significantly, their integration with pro environmental behavior of employees (PEB/OCBE) is still relatively limited, and becomes very rare when focused on the public sector. The low proportion of studies combining these three dimensions confirms the existence of a substantial research gap, particularly in the context of public administration and public service organizations.

Therefore, the synthesis of the 17 selected articles makes an important contribution to strengthening the conceptual understanding of the role of green leadership in encouraging PEB among public sector employees, as well as opening up opportunities for the development of a more contextual and applicable sustainable research agenda.

The visualization of keyword networks using VOSviewer in Figure 2 shows the thematic structure of green leadership research divided into several main clusters. The central cluster is dominated by the concepts of green innovation, sustainability, and green human resource management (GHRM), indicating that most studies view green leadership as a strategic mechanism that works through organizational management and innovation systems.

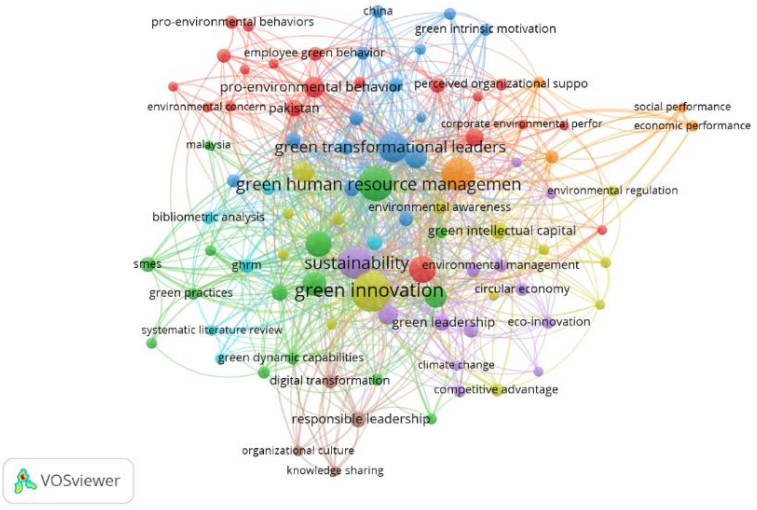

Figure 2. Network map of green leadership related studies and their weak linkage to pro-environmental behaviour in the public sector

The concepts of green transformational leadership and green leadership are strongly linked to environmental performance issues, such as environmental management, eco innovation, and competitive advantage. This confirms that the existing literature is more oriented towards organizational level outcomes than individual behavioral change.

Conversely, the link between green leadership and pro environmental behavior appears relatively weaker and is peripheral in the keyword network. Terms such as employee green behavior, environmental concern, and perceived organizational support appear, but have not yet formed a dominant, conceptually integrated cluster. This condition shows that the micro mechanisms of employee behavior are still not a major focus in green leadership studies, especially in the public sector.

The VosViewer country based network visualization in Figure 3 shows that green leadership research is dominated by developing countries, particularly China and Pakistan, which serve as the main nodes in the research collaboration network. Other countries such as Malaysia, Saudi Arabia, and India also show significant contributions, reflecting the growing attention to sustainability issues in Asia and the Middle East.

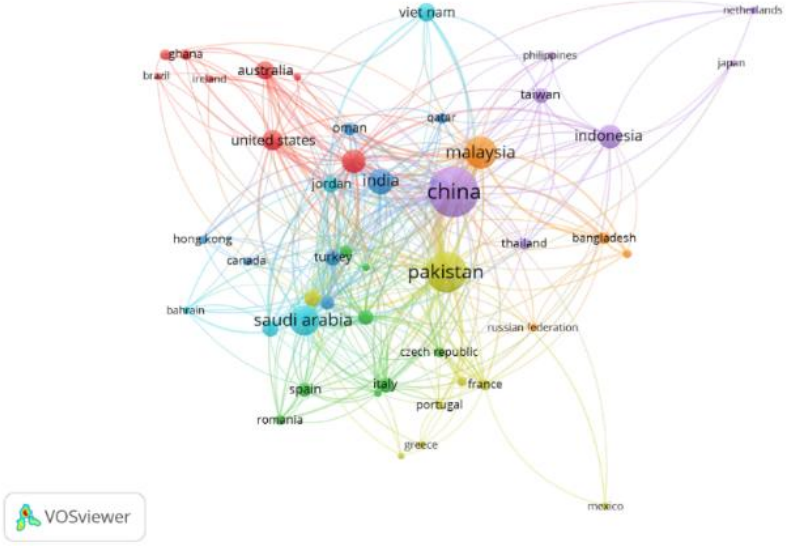

Figure 3. Geographical distribution and network patterns of green leadership research

Conversely, contributions from countries with established public administration systems, such as Western European and North American countries, tend to be scattered and do not specifically focus on the integration of green leadership and PEB in the public sector. Indonesia emerges as a node connected to several Asian countries, but the number and depth of studies are still limited. This pattern indicates that studies of green leadership in the public sector are still contextual in nature and have not yet developed into a mainstream area of global research. Table 1 shown a article data.

Table 1. Article Data

No	Author (Year)	First Author Country	Journal	Research Objective	Key Findings	Contribution to Green Leadership & PEB	Relevance to Green Policy & Public Sector
1	Shiferaw et al. (2025)	Ethiopia	Sustainable Futures	To examine the effect of green leadership on sustainable performance	Green leadership improves sustainable performance through innovative behavior	Innovative behavior as a pathway linking green leadership and PEB	Foundation for strengthening green leadership policies
2	Alzuman et al. (2025)	Saudi Arabia	Sustainability	To test the mediating role of GHRM between green leadership and advocacy	GHRM mediates the relationship between green leadership and green advocacy	PEB as an outcome of green HR policies	Design of green HR policies in the public sector

No	Author (Year)	First Author Country	Journal	Research Objective	Key Findings	Contribution to Green Leadership & PEB	Relevance to Green Policy & Public Sector
3	Amoako et al. (2025)	Ghana	Sustainable Futures	To develop a conceptual framework linking green leadership and citizenship	Green leadership promotes green citizenship behavior	Extension of PEB to external stakeholders	Public policy based on leadership role modeling
4	Owusu et al. (2025)	China	Business Strategy and the Environment	To examine Eco TFL effects on healthcare workers' PEB	Eco TFL enhances PEB through green practices and climate	Comprehensive green leadership–PEB model in services	Green policies in the public healthcare sector
5	Fernández Galeote et al. (2025)	Finland	Environmental Education Research	To explore future leaders' perceptions of sustainability	Understanding of sustainability remains ambivalent	Psychological barriers to green leadership	Public leadership education policies
6	Yang et al. (2025)	Australia	Australian Journal of Management	To synthesize environmentally sustainable leadership research	Leadership influences PEB, innovation, and environmental strategy	Clarification of leaders vs. leadership roles in PEB	Conceptual foundation for green public policies
7	Azhar & Yang (2022)	USA	Review of Public Personnel Administration	To examine the influence of transformational leadership and green culture on PEB in Florida city governments	Transformational leadership and green culture significantly influence PEB among public employees	Empirical evidence from the US public sector; green culture as a moderator	Public sector leadership and green culture policies
8	Rogozińska-Pawełczyk (2024)	Poland	Energies	To test PEIL PEWB relationships using moderated mediation	Psychological contracts mediate and awareness moderates effects	Psychological mechanisms of green leadership–PEB	Public energy policy relevance
9	Huang et al. (2024)	Taiwan	Sustainability	To test E CSR policies as mediators between leadership and PEB	E CSR policies mediate leadership effects on PEB	Formal policy pathway linking leadership and PEB	Internal green policy in public organizations
10	Ullah Khan et al. (2023)	Malaysia	SETA	To examine green leadership and knowledge sharing	Knowledge sharing mediates green leadership effects	Cognitive pathway of green leadership PEB	Public knowledge management policies
11	Janovac et al. (2023)	Serbia	Sustainability	To assess leadership models in public sector reforms	Charismatic leadership is most influential	Conceptualization of sustainable leadership	Relevance of public policy reform
12	Javaid et al. (2023)	China	LODJ	To examine followership roles in green leadership	Followers' PEB shapes green leadership	Bottom up perspective on green leadership	Public HR development implications
13	Kolandai et al. (2023)	New Zealand	Journal of Environme	To examine environmental awareness	High public support for	Cultural foundations of	Legitimization of green public policies

No	Author (Year)	First Author Country	Journal	Research Objective	Key Findings	Contribution to Green Leadership & PEB	Relevance to Green Policy & Public Sector
			ntal Psychology	during the Anthropause	environmental policies	PEB and green leadership	
14	Omarova & Jo (2022)	South Korea	Sustainability	To test ETL effects on employees' PEB	Environmental awareness mediates ETL PEB	Classical green leadership PEB model	Public organization implementation
15	Al-Swidi et al. (2021)	Qatar	Journal of Cleaner Production	To examine GHRM, leadership, culture, and green behavior	Green culture mediates leadership–PEB	Systemic green leadership framework	Internal public policy design
16	Wang et al. (2020)	Hong Kong (China)	Environmental Policy and Governance	To examine motivations for public green leadership	Leadership driven by regulation and incentives	Green leadership as a policy driven outcome	Key public sector evidence
17	Zhang et al. (2026)	China	Journal of Innovation & Knowledge	To examine green transformational leadership's influence on pro-environmental behaviors in China's NEV sector, with green motivation as mediator	GTL positively affects PEB directly and indirectly through intrinsic & extrinsic motivation (partial mediation).	Reveals dual-pathway mechanism (intrinsic & extrinsic motivation work synergistically)	Provides insights for designing incentives & training to support national sustainability goals in regulated industries.

Based on an analysis of 17 selected articles, this study identifies several key thematic patterns that explain the relationship between green leadership and PEB in an organizational context, including its implications for the public sector. The main findings of this systematic literature review can be synthesized as follows:

First, Green Leadership has a positive and significant influence on PEB, both directly and indirectly through various mediating mechanisms. Most studies (Al-Swidi et al., 2021; Omarova & Jo, 2022; Shiferaw et al., 2025) show that environmentally oriented leadership styles (such as green leadership, eco transformational leadership, or pro environmental inclusive leadership) can effectively shape, motivate, and strengthen employee PEB. This influence is confirmed across various sectors, including manufacturing, tourism, health, and energy, indicating the potential transferability of this concept to the context of local government bureaucracy.

Second, Green Policy acts as a critical institutional mechanism that bridges the values and directions of green leadership with individual practices and behaviors at the operational level. Several articles (Alzuman et al., 2025; Huang et al., 2024; Wang et al., 2020) emphasize that green leadership is often manifested and institutionalized through formal organizational policies, such as Green Human Resource Management (GHRM), Environmental Corporate Social Responsibility (E CSR) policies, or eco compensation programs. These policies serve as instruments that translate leadership vision into structured procedures, incentives, norms, and systems, which ultimately shape employee PEB. These findings are in line with research (Janovac et al., 2023) that emphasizes the importance of institutionalizing reform through appropriate policies and governance in the public sector.

Third, there are various mediation and moderation pathways that explain the mechanism of green leadership's influence on PEB. This review reveals several important psychological, social, and organizational mechanisms, including:

a. Leader Behavior and Innovation Mechanism: Leader Innovation Behavior (Shiferaw et al., 2025)and Leader Green Behavior (Javaid et al., 2023)serve as intermediaries that connect leadership values with concrete actions.

b. Human Resource Management Mechanisms: Green Human Resource Management (GHRM) and Green Human Resource Practices (GHRP) serve as key mediators (Alzuman et al., 2025; Omarova & Jo, 2022;

Owusu et al., 2025), indicating that integrating environmental principles into recruitment, training, performance appraisal, and rewards is highly effective in fostering PEB.

c. Psychological Cognitive Mechanisms: Environmental Awareness, Green Psychological Climate, Psychological Contract for the Environment (PCFE), and Environmental Identity (Huang et al., 2024; Owusu et al., 2025; Rogozińska-Pawełczyk, 2024) function as mediators linking leadership influence with changes in individual attitudes and behavioral intentions.

d. Knowledge and Culture Mechanisms: Environmental Knowledge Sharing (Ullah Khan et al., 2023)and Green Organizational Culture (Al Swidi et al., 2021)serve as channels through which environmental norms and knowledge are disseminated, thereby collectively strengthening PEB.

Crucially, a cross-study comparison of these mechanisms reveals notable differences in their relative importance and consistency. GHRM emerges as the most frequently examined and consistently significant mediator, being validated across diverse sectors and methodological approaches, suggesting it is the most robust pathway for institutionalizing green leadership. Psychological mechanisms, such as environmental awareness and psychological contracts, exhibit moderate consistency but demonstrate stronger effects when combined with formal policy cues. In contrast, knowledge-sharing mechanisms, while identified in fewer studies, show consistently positive indirect effects, indicating a promising yet underexplored pathway. This comparative synthesis clarifies that no single mechanism operates in isolation; rather, their effectiveness varies according to organizational readiness and policy integration.

Fourth, the public sector context has unique characteristics and dynamics that influence the relationship between green leadership and PEB. Articles that explicitly examine the public sector (Janovac et al., 2023; Owusu et al., 2025; Wang et al., 2020) reveal that green leadership motivation in bureaucracies is often driven by a combination of legal compliance factors, instrumental incentives (economic/political), and normative values. Additionally, hierarchical structures, rigid organizational cultures, and the complexity of public accountability can be both limiting factors and opportunities for the institutionalization of green policy. The research by Wang et al (2020) specifically highlights that the success of pro environmental leadership in the public sector is highly dependent on appropriate policy design, supportive work environments, and implementation capacity.

Fifth, there is a reciprocal interaction and bottom up influence in shaping green leadership. The study by Javaid et al (2023) introduces an important perspective that followers' pro environmental behavior (FPEB) and critical capacity of subordinates (such as independent critical thinking) can actively influence and strengthen leader green behavior. These findings suggest that in the context of bureaucracy, employee PEB is not only the result of top down leadership, but can also be a driving force that shapes the commitment and strategies of leaders.

Based on the synthesis of the above findings, this discussion will directly answer the research question posed: "How does green leadership influence employee PEB in local government bureaucracies, and through what mechanisms, particularly through the role of green policy, is this influence formed and implemented?"

In the context of local government bureaucracy, green leadership acts as a catalyst for transforming sustainability values into employee operational behavior. Leaders who apply green leadership principles by demonstrating commitment to the environment, articulating a vision of sustainability, and modeling environmentally friendly behavior can directly influence employees' norms, attitudes, and perceptions about the importance of environmental issues in their work (Omarova & Jo, 2022; Yang et al., 2025)This direct influence is particularly effective in building initial awareness and normative commitment.

However, the hierarchical, bureaucratic, and regulation laden characteristics of bureaucracy demand more than just direct influence based on values. This is where the role of green policy becomes central. Green leadership at the local leadership level (e.g., mayor, regent, or head of agency) needs to be institutionalized through a series of formal and structured internal policies (green policies). These policies serve as reinforcement mechanisms and operational guidelines that translate strategic directions into concrete actions at the work unit and individual employee levels.

Based on literature findings, three main pathways can be identified for how green policy shapes and exerts the influence of green leadership on local government employees' PEB:

a. Regulatory Instrumental Pathway: Green policy creates a framework of rules, standards, and procedures that mandate certain behaviors. For example, mayoral regulations on energy and paper conservation, or departmental guidelines on waste sorting in offices. This mechanism works through compliance, where employees adopt PEB due to formal mandates, sanctions, or incentives (Wang et al., 2020). Green leadership plays a role in designing, approving, and overseeing the implementation of these policies.

b. Managerial Organizational Path: Green policy is implemented in human resource management and operational systems. The application of Green HRM in bureaucracy, such as incorporating environmental criteria in recruitment, environmental awareness training, green performance appraisal, and awards, creates a cycle that systematically fosters and strengthens PEB(Al-Swidi et al., 2021; Alzuman et al., 2025). Green leadership ensures that sustainability principles are integrated into all these management practices.

c. Normative Cultural Path: Green policy serves as a tool to shape green organizational culture and green psychological climate in the government workplace. Policies that encourage participation, knowledge, and environmental identity (e.g., environmental knowledge sharing programs, formation of green teams, or internal campaigns) can change shared values and beliefs (Rogozińska-Pawełczyk, 2024; Ullah Khan et al., 2023) Green leadership leads by example and consistent communication to internalize these values into the organizational culture, so that PEB emerges not only as an obligation but as part of shared identity and norms.

This discussion also reveals that the dynamics of the relationship between green leadership, green policy, and PEB in local government bureaucracy have unique characteristics:

a. Dual Motivation: Green leadership may be driven by external pressures (central regulations, community demands) and instrumental incentives (image, interregional competitiveness) in addition to personal values (Wang et al., 2020). Green policies need to take this dual motivation into account to be effective.

b. Role of Policy Entrepreneurs: Regional leaders can act as policy entrepreneurs who take advantage of momentum (such as national strategic issues or local environmental disasters) to introduce and encourage the adoption of green policies (Kolandai et al., 2023).

Bottom up Interaction: The aspirations and good practices of street level bureaucrats who have demonstrated PEB can provide feedback and moral pressure to leaders, thereby encouraging the strengthening of green leadership and the refinement of green policies (Javaid et al., 2023).

To translate these findings into actionable practice, this review offers three specific recommendations. For leadership development, public sector institutions should design tiered competency programmes that equip senior officials with strategic visioning for sustainability and mid-level managers with skills to translate these visions into work-unit directives, complemented by formal mentoring and role-modelling schemes. For HRM practices, it is recommended that performance appraisal systems incorporate quantifiable environmental outcomes, promotion criteria include demonstrated contributions to organizational sustainability, and training curricula embed environmental management modules tailored to bureaucratic functions. For sustainability governance, local governments should establish cross-departmental green task forces, mandate routine environmental performance audits for all work units, and institute performance-based budgeting that allocates resources to units achieving measurable green targets. These recommendations directly address the institutional specificities of local government bureaucracies, moving beyond generic prescriptions to provide actionable guidance for policy designers and human resource practitioners.

4. Conclusion

Based on a systematic review of the latest literature, this study concludes that green leadership is a critical driver in shaping employee PEB in the public sector. However, this influence does not occur directly or automatically. In the context of local government bureaucracy, the effectiveness of green leadership is highly dependent on its ability to be institutionalized through internal green policies. These policies serve as key mechanisms that translate leadership vision and values into structured procedures, norms, and systems, thereby guiding and facilitating employees to act in an environmentally friendly manner.

More specifically, this study identifies three main channels through which green policy plays its mediating role. First, through the regulatory instrumental channel, where policies set rules and standards that must be followed. Second, through the managerial organizational channel, by integrating green principles into HR systems, such as recruitment, training, and performance appraisal. Third, through the normative cultural pathway, which involves building an organizational culture and collective identity oriented towards sustainability. These three pathways reinforce each other and show that building PEB in bureaucracy is a multidimensional effort that combines compliance, incentives, and value change.

The theoretical contribution of this study lies in its attempt to strengthen the framework of green leadership and PEB by explicitly placing green policy as a key mediating variable in the context of the public sector, which has been limited so far. Furthermore, this study integrates top down (from leadership and policy) and bottom up (from employee participation and influence) perspectives to provide a more holistic understanding of the dynamics of PEB formation in public organizations. This synthesis produces a preliminary conceptual model that places the design and implementation of green policies as a bridge between leadership

and behavior, with its effectiveness influenced by contextual factors such as political support and organizational culture.

The practical implications of these findings, when explicitly grounded in the synthesized evidence, provide clear guidance for policymakers in local government. Drawing directly from the synthesized evidence particularly the consistent findings that environmentally oriented leadership styles directly shape employee norms and attitudes (Azhar & Yang, 2022b; Omarova & Jo, 2022) that leadership influence is strongly mediated by formal green policies and GHRM (Al-Swidi et al., 2021; Alzuman et al., 2025; Huang et al., 2024), and that organizational culture and psychological climate reinforce voluntary behavioral change (Azhar & Yang, 2022; Rogozińska-Pawełczyk, 2024) the following evidence-based recommendations are proposed. To promote effective and sustainable PEB, the following are needed: (1) Development of green leadership capacity for structural officials through training that builds competencies in vision formulation, exemplary leadership, and empowerment, a recommendation supported by the direct and indirect effects of leadership on PEB consistently reported across multiple sectors (Omarova & Jo, 2022; Shiferaw et al., 2025) ; (2) Institutionalization of commitment into concrete and measurable green policies, such as local regulations on resource efficiency and green procurement, this is grounded in studies confirming that green policies and regulatory instruments serve as critical institutional mechanisms translating leadership vision into operational compliance and behavioral mandates (Huang et al., 2024; Wang et al., 2020); (3) Integration of sustainability indicators into the human resource system, including in performance appraisals and career development, this follows directly from the robust evidence identifying GHRM and GHRP as the most frequently validated and consistently significant mediators linking green leadership to employee PEB (Alzuman et al., 2025; Omarova & Jo, 2022; Owusu et al., 2025); and (4) Cultivation of green values through consistent communication, the formation of communities of practice, and reward mechanisms.

Although it provides an important conceptual roadmap, this review has limitations because the majority of the underlying studies come from the private sector or other countries. Therefore, a future research agenda is needed to empirically test and adapt the green leadership green policy PEB relationship model in the context of Indonesian bureaucracy. Further research could explore comparisons of the effectiveness of different types of policies (regulatory versus persuasive), analyze the role of external stakeholders such as the public and NGOs, and consider factors specific to Indonesia such as bureaucratic culture, local political dynamics, and the national regulatory framework in strengthening the transformation towards sustainable governance.

Author Contributions

All authors (Meilinda Nuur Pratiwi, Junaidi Budi Prihanto, Warju Warju, Wildan Taufik Raharja, and Ahmad Zubir Ibrahim) contributed equally to this work. All authors collaboratively participated in Conceptualization, Methodology, Investigation, Writing Original Draft, Visualization, Supervision, Validation, Writing-Review & Editing, Formal Analysis, Data Curation, Resources, Software, and Project Administration. All authors have read and approved the final manuscript.

Funding

No funding support was received.

Declaration of Conflicting Interests

The author declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Data Availability

The datasets generated during and/ or analyzed during the current study are available from the corresponding author on reasonable request.

Declaration on AI Use

The authors declare that no artificial intelligence (AI) or AI-assisted tools were used in the preparation of this manuscript.

Acknowledgement

The authors would like to thank Surabaya State University and Northern University of Malaysia for their institutional support during the preparation of this manuscript.

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