

Systematic Review

Environmental Management in Office-Based Organizations: A Systematic Review of Green Office Practices, Employee Green Behaviour and Organizational Sustainability

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Abstract

Green office practices are increasingly relevant to organizational sustainability, yet evidence remains dispersed across Green Human Resource Management (Green HRM), employee green behaviour, workplace design, environmental management, and indoor environmental quality. This systematic review synthesizes empirical evidence on green office practices in office-based organizational settings. Following PRISMA 2020, searches were conducted in Web of Science Core Collection and Scopus, supplemented by ScienceDirect, Emerald Insight, PubMed, and Google Scholar. In total, 594 records were identified; 22 empirical studies met the inclusion criteria and were thematically synthesized. Quality appraisal showed that all included studies provided sufficient empirical and thematic support, but the evidence base was dominated by cross-sectional and self-reported designs, limiting causal interpretation. The review addresses a gap in syntheses of Green HRM and employee green behaviour by examining the green office as a workplace-level setting where environmental management, people-management systems, workplace conditions, and everyday routines intersect. Findings show that green office practices are effective when supported by governance, Green HRM, leadership, culture, and employee participation. Employee green behaviour emerges as the mechanism translating environmental intentions into daily routines. Office-based organizations should connect green office measures with clear responsibilities, Green HRM routines, participation, and measurable resource-use indicators rather than treating them as stand-alone campaigns.

Keywords: green office practices; employee green behaviour; Green HRM; environmental management; organizational sustainability; office-based organizations



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1. Introduction

Sustainability in office-based organizations is often addressed through visible measures: reducing paper use, improving energy efficiency, introducing recycling points, adding plants, using certified buildings, or reminding employees to switch off devices after work. Such measures are important, but they capture only part of the process. Offices are also managerial, social, behavioural, and cultural environments. Decisions about printing, electricity use, waste separation, digital communication, indoor comfort, office equipment,

commuting, and shared resources are made repeatedly in ordinary work situations. Individually, these decisions may appear minor; collectively, they form a meaningful part of organizational environmental performance.

Accordingly, green office practices need to be examined as more than a set of operational improvements. In office-based organizations, environmental management is supported not only by policies, but also by routines, expectations, leadership signals, workplace design, employee participation, and human resource management practices. A green office is therefore not merely a workplace with environmentally friendly features. It is a setting in which infrastructure, behaviour, management systems, and organizational culture intersect in everyday work.

In this review, green office practices are understood as workplace-level environmental practices and routines implemented in office-based or comparable organizational settings. They include measures such as paper reduction, energy saving, recycling, waste separation, sustainable procurement, responsible use of digital tools and office equipment, and resource-efficient daily office routines. Related constructs are treated as analytically distinct. Green HRM, leadership, organizational culture, organizational support, and environmental governance are interpreted as antecedents or enabling conditions that support the implementation of green office practices. Employee green behaviour is treated as the behavioural mechanism through which these practices are enacted in daily work. Workplace design, green buildings, indoor environmental quality, sectoral context, institutional setting, and regulatory conditions are treated as contextual factors that may shape implementation and employee experience. Organizational sustainability, environmental performance, resource efficiency, employee engagement, and green workplace outcomes are treated as outcomes. This distinction was used to reduce conceptual overlap and to structure the thematic synthesis and integrative framework.

Theoretical Positioning of the Review

This review is guided by an integrative theoretical positioning rather than by a single theory. This approach is appropriate because green office practices connect environmental management, people-management systems, employee behaviour, workplace conditions, and organizational sustainability. Three theoretical perspectives are particularly relevant. First, the Ability-Motivation-Opportunity framework helps explain how Green HRM and leadership can support employee green behaviour by developing employees' environmental ability through training, strengthening motivation through recognition and values-based communication, and creating opportunities through participation, workplace routines, and supportive infrastructure. Second, Social Exchange Theory helps explain why employees may be more willing to engage in pro-environmental workplace behaviour when they perceive organizational support, credible leadership, and fair environmental expectations. Third, Institutional Theory helps situate green office practices within broader pressures related to environmental regulation, environmental, social, and governance reporting, organizational legitimacy, and sustainability governance. Together, these perspectives support the interpretation of green office practices as a workplace-level alignment process in which formal environmental management is translated into employee-facing practices and repeated daily routines. They also provide the theoretical basis for the integrative conceptual framework developed in this review.

The framework is also consistent with resource-based, stakeholder, and socio-technical interpretations of organizational sustainability. From a resource-based view, green office practices depend on organizational capabilities, including environmental knowledge, employee competences, leadership routines, Green HRM practices, monitoring systems, and supportive infrastructure. From a stakeholder perspective, green office implementation

reflects expectations from internal and external stakeholders, including employees, managers, regulators, clients, and wider societal actors, whose demands shape the legitimacy and priority of environmental practices. From a socio-technical systems perspective, green office outcomes depend on the alignment between social elements, such as leadership, participation, HRM, communication, and employee agency, and technical or material elements, such as workplace design, indoor environmental quality, equipment, digital systems, and resource-use infrastructure. These perspectives strengthen the framework by explaining why organizational practices influence employee sustainability-related behaviour only when capabilities, stakeholder expectations, social routines, and workplace systems are mutually reinforcing.

This perspective is consistent with broader environmental management approaches, in which environmental objectives are integrated into organizational processes, decision-making structures, and management systems such as ISO 14001, rather than treated as separate technical tasks [1].

Research on Green HRM offers one important entry point into this problem. Renwick et al. [2] positioned Green HRM as a field linking environmental management with recruitment, training, performance management, employee involvement, and reward systems. The value of this contribution lies in showing that environmental goals cannot remain outside the way people are managed. Jackson et al. [3] made a similar point by connecting organizational greening with how employees are selected, developed, motivated, and supported. Kramar [4] then placed HRM in a broader sustainability perspective, where organizational performance is considered together with longer-term human, social, and environmental consequences.

Subsequent studies developed this discussion from a general argument into more specific organizational mechanisms. Renwick et al. [5] showed that Green HRM had become a distinct research field, while also emphasizing the importance of embedding environmental values in HRM processes. Guerci et al. [6] demonstrated that stakeholder pressures can be translated into environmental performance through Green HRM practices. Tang et al. [7] developed and validated a measurement scale for Green HRM practices, enabling more systematic empirical examination of how organizations integrate environmental expectations into people-management systems. Roscoe et al. [8] further showed that Green HRM can support green organizational culture and environmental performance.

The employee perspective is particularly important in office-based organizations, where many green practices depend less on major technological investment than on repeated everyday behaviour. Ones and Dilchert [9] framed environmental sustainability at work as a call for active employee participation. Boiral and Paillé [10] conceptualized organizational citizenship behaviour for the environment as voluntary behaviour that supports environmental goals beyond formal job requirements. Paillé et al. [11] linked environmental management practices with environmental citizenship behaviour through social exchange, while Norton et al. [12] emphasized the multilevel nature of employee green behaviour. Katz et al. [13] later confirmed through meta-analysis that employee green behaviour has become a robust construct in organizational sustainability research.

Leadership and organizational support help determine whether such behaviour remains incidental or becomes embedded in work culture. Ramus and Steger [14] showed that supervisory support and environmental policy influence employee eco-initiatives. Robertson and Barling [15] demonstrated that leaders can influence employees' pro-environmental behaviour by shaping values, motivation, and responsibility. Graves et al. [16] connected transformational leadership and employee motivation with pro-environmental behaviour, while Kim et al. [17] showed that voluntary workplace green behaviour is influenced by individual differences, leader behaviour, and coworker advocacy. For green office practices,

this means that employees are more likely to act sustainably when environmental behaviour is socially supported, organizationally expected, and practically enabled.

Motivation and engagement add a further layer. Unsworth et al. [18] argued that workplace interventions are more effective when they address the motives behind behaviour rather than relying only on information or instruction. Temminck et al. [19] emphasized the role of organizational support and meaningful engagement. Raineri and Paillé [20] linked corporate environmental policy and supervisory support with environmental citizenship behaviour through employee beliefs and commitment. Tian and Robertson [21] showed that perceived corporate social responsibility can stimulate voluntary pro-environmental behaviour when employees identify with organizational values, while Ababneh [22] demonstrated that employee engagement and personal attributes shape the relationship between Green HRM practices and green behaviour.

Collectively, Green HRM studies indicate that environmental behaviour at work is not merely a matter of personal ecological preference. Dumont et al. [23] found that Green HRM practices influence workplace green behaviour through psychological green climate and employee green values. Pellegrini et al. [24] showed that sustainable human resource practices can influence employee behaviour for corporate sustainability. Pham et al. [25], although focused on hospitality, demonstrated that Green HRM can foster organizational citizenship behaviour for the environment. Amrutha and Geetha [26] reviewed Green HRM in relation to social sustainability, while Miah et al. [27] confirmed that Green HRM remains closely connected with sustainability but still requires more synthesis across related domains. Lawter and Garnjost [28] and Gkikas et al. [29] likewise show that recent research increasingly connects HRM, employee green behaviour, environmental performance, and organizational outcomes.

The physical workplace provides a second line of evidence. Green office practices are enacted in real work environments, where indoor environmental quality, spatial design, building performance, and employee perceptions matter. Singh et al. [30] showed that green buildings can affect employee health and productivity. Frontczak et al. [31] demonstrated that occupant satisfaction is related to indoor environmental quality and building design. Altomonte and Schiavon [32] compared occupant satisfaction in LEED and non-LEED certified buildings, while Newsham et al. [33] questioned whether green buildings consistently provide better indoor environments. These studies caution against assuming that certification or infrastructure alone defines a successful green office.

Other workplace studies reach a similar conclusion from the perspective of health, cognition, and well-being. Thatcher and Milner [34] reported changes in productivity, psychological well-being, and physical well-being among employees working in a green building. Allen et al. [35] found associations between cognitive function scores and carbon dioxide, ventilation, and volatile organic compound exposure in office workers. MacNaughton et al. [36] examined the impact of working in a green-certified building on cognitive function and health. de Vries et al. [37] explored the effects of indoor plants on office workers. This body of work confirms the relevance of physical workplace characteristics, while also indicating that they need to be interpreted alongside behavioural and managerial dimensions.

Despite this evidence, the field remains fragmented. Green HRM, employee green behaviour, green buildings, indoor environmental quality, environmental management, and organizational sustainability are often examined in parallel rather than in connection. Studies on buildings and indoor quality tend to focus on physical conditions, health, comfort, or productivity. Studies on Green HRM and employee green behaviour usually emphasize leadership, motivation, culture, and HRM practices. Studies on organizational sustainability often remain at a strategic level. Yuriev et al. [38] showed

that workplace pro-environmental behaviour is shaped by multiple barriers, while Zhang et al. [39] confirmed that employee green behaviour is a growing but conceptually dispersed research field. Zacher et al. [40] described employee green behaviour as central to environmentally sustainable organizations; however, the office-based connection between behaviour, HRM, workplace characteristics, and environmental management remains insufficiently synthesized.

The research gap therefore lies in the relationship among these strands of evidence. Existing studies provide valuable findings on Green HRM, employee green behaviour, green buildings, indoor environmental quality, and organizational sustainability, but they rarely explain how green office practices operate as part of environmental management in office-based organizations. There is also limited synthesis of how employees contribute to the effectiveness of green offices through everyday behaviour, and how HRM, leadership, organizational culture, workplace characteristics, and environmental management support that process. This review addresses that gap by bringing together empirical evidence from these related but still insufficiently connected areas. Furthermore, relatively little is known about how green office practices contribute to measurable environmental performance and broader environmental governance within organizations. The available evidence also appears geographically uneven, as many studies originate from Asian organizational contexts, whereas green office practices in European and other international settings remain less frequently examined.

Although previous reviews have made important contributions by synthesizing Green HRM, employee green behaviour, workplace pro-environmental behaviour, or organizational sustainability, these reviews have tended to examine these domains as separate research streams. They have less systematically addressed the green office as a specific workplace-level setting in which environmental management, HRM practices, leadership, workplace design, indoor environmental quality, and repeated employee routines intersect. For this reason, existing reviews provide only limited explanation of how green office practices operate as organizational mechanisms through which environmental strategies are translated into everyday office work. The distinct contribution of this review is therefore not to repeat existing Green HRM or employee green behaviour syntheses, but to position green office practices as an integrative organizational construct that connects environmental management, people-management systems, workplace conditions, employee behaviour, and organizational sustainability in office-based and broader organizational workplace settings.

More specifically, the justification for this review rests on three unresolved integration gaps. First, previous Green HRM and employee green behaviour reviews have clarified people-management and behavioural mechanisms, but have paid less attention to the office as a concrete workplace setting in which these mechanisms are enacted. Second, studies on green buildings, workplace design, and indoor environmental quality have examined physical workplace conditions, but have less often connected them with HRM systems, leadership, employee routines, and environmental governance. Third, environmental management and organizational sustainability research has frequently addressed strategy, policy, or performance, but has provided less integrated explanation of how office-level practices become embedded in everyday work. This review addresses these gaps by synthesizing empirical evidence across these domains and by developing a framework that positions green office practices as the workplace-level link between environmental management, people-management systems, workplace conditions, employee enactment, and sustainability-related outcomes.

On this basis, the systematic review addresses the following research questions:

RQ1: How are green office practices conceptualized and implemented in office-based organizations?

RQ2: How do employee green behaviour and pro-environmental workplace behaviour contribute to organizational sustainability?

RQ3: What roles do Green HRM practices, leadership, organizational culture, and workplace characteristics play in supporting environmental management in office-based organizations?

RQ4: Which organizational, leadership-related, and HR-related factors are identified in the literature as key drivers of, or barriers to, the implementation of green office practices?

RQ5: How are green office practices, employee green behaviour, and environmental management connected to broader organizational sustainability goals?

2. Materials and Methods

2.1. Protocol and Registration Details

This review was performed in accordance with the PRISMA 2020 guidelines [41]. The Supplementary Materials and review documentation are available in Zenodo, including the PRISMA 2020 checklist, search strategy and screening log, full-text eligibility log, extended quality appraisal table, data extraction table, and PRISMA flow diagram: <https://doi.org/10.5281/zenodo.21038081>.

This study adopts a systematic literature review design with qualitative thematic synthesis to synthesize empirical evidence on environmental management in office-based organizations, with particular emphasis on green office practices, employee behaviour, and organizational sustainability. This design was selected because the topic is interdisciplinary and draws on environmental management, organizational behaviour, Green HRM, workplace sustainability, indoor environmental quality, and corporate sustainability. The review therefore required a transparent and structured approach capable of integrating evidence from conceptually related but methodologically heterogeneous research streams, while identifying common themes, research gaps, and implications for environmental management practice.

The PRISMA 2020 main checklist and PRISMA 2020 abstract checklist are provided in Supplementary File S1, while the detailed search, screening, eligibility log, PRISMA numerical pathway, and study-selection documentation are provided in Supplementary File S2. The review was not intended as a meta-analysis, but as a qualitative thematic synthesis, because the included articles differ in research design, theoretical background, organizational context, sample characteristics, and measured variables.

The review focused on peer-reviewed original empirical research articles published in English from 2010 onwards. Studies were eligible when they examined environmental management, green office practices, green workplace practices, employee green behaviour, employee pro-environmental behaviour, Green HRM, environmental performance, or organizational sustainability in office-based, administrative, service-oriented, public-sector, private-sector, or broader organizational workplace settings. Studies that did not explicitly use the term green office were also eligible when they provided empirically relevant evidence on green workplace practices, employee environmental behaviour, Green HRM, or organizational sustainability in an organizational or workplace context.

The term “office-based organizations” refers primarily to administrative, service-oriented, public-sector, higher-education, corporate, and other knowledge-work settings in which environmental practices are implemented through office routines, employee behaviour, resource use, workplace facilities, and organizational management systems. Broader organizational workplace settings were included only when they provided empirically relevant evidence on practices comparable to green office implementation, such

as employee pro-environmental behaviour, Green HRM, workplace sustainability routines, environmental management, or organizational sustainability in non-industrial and non-production-oriented work environments. Studies focused exclusively on industrial production, construction technology, urban infrastructure, building engineering, or technical energy systems without a clear organizational, managerial, or employee-related workplace dimension were excluded. This boundary was applied to preserve the office-based focus of the review while allowing inclusion of empirical studies that did not use the exact term “green office” but addressed substantively comparable workplace-level sustainability practices.

The synthesis was organized thematically around the main constructs of the review: organizational sustainability and environmental management, Green HRM, workplace characteristics, green office practices, and employee environmental behaviour. This design made it possible to examine how green office and workplace practices are conceptualized in the literature, how employee behaviour contributes to environmental outcomes, and how these practices are linked to broader organizational sustainability.

To preserve transparency and make the review process auditable, the search strategy, eligibility criteria, screening decisions, quality appraisal procedure, synthesis logic, completed PRISMA 2020 checklists, and PRISMA 2020 flow documentation are reported in the main manuscript and Supplementary Files.

The absence of a registered protocol is acknowledged as a methodological limitation of this review, because external protocol registration would have provided an additional safeguard against post hoc decisions during study selection and synthesis. However, the review process was conducted through a predefined and documented workflow. The search sources and search strings, inclusion and exclusion criteria, screening-table fields, reasons for exclusion, quality appraisal criteria, PRISMA flow documentation, and thematic synthesis procedures were recorded during the review process and are reported in the main manuscript and Supplementary Files. This documentation was used to reduce the risk of retrospective decision-making and to provide an audit trail for the identification, screening, eligibility, quality appraisal, and synthesis stages. The protocol-related documentation has already been submitted as Supplementary Material with the revised manuscript, rather than being added retrospectively after acceptance. The findings should nevertheless be interpreted with this limitation in mind.

To improve the transparency of the revised manuscript, additional methodological details are now reported in the main text, particularly regarding protocol status, search procedures, study selection, quality appraisal, thematic synthesis, and the derivation of the conceptual framework.

2.2. Search Strategy

A structured literature search was performed to identify peer-reviewed original empirical research articles addressing environmental management in office-based organizations, green office practices, employee green behaviour, Green HRM, and organizational sustainability. The search process was completed in May 2026, with final search verification conducted on 31 May 2026.

The literature search was conducted in Web of Science Core Collection and Scopus as the primary academic databases. To ensure broader interdisciplinary coverage and to cross-check potentially relevant peer-reviewed sources, the search was supplemented by ScienceDirect, Emerald Insight, PubMed, and Google Scholar. These databases and search sources were selected because the review topic spans environmental management, sustainability, organizational behaviour, workplace studies, Green HRM, employee-related environmental practices, and workplace or office-based environmental conditions.

The search strategy was adapted to the technical requirements and search fields of each database while maintaining conceptual consistency across all searches. Boolean operators were used to combine the key constructs of the review topic, including terms related to green office practices, green workplace practices, environmental management, employee green behaviour, employee pro-environmental behaviour, Green HRM, and organizational sustainability. Search strings were adjusted for title, abstract, keyword, topic, or all-field searches according to database functionality.

The search terms were selected to balance sensitivity and conceptual specificity. The strategy combined three groups of terms: (1) office- and workplace-related terms, such as green office, green workplace, office-based organizations, and workplace sustainability; (2) employee- and HRM-related terms, such as employee green behaviour, employee pro-environmental behaviour, Green HRM, leadership, organizational culture, and employee participation; and (3) environmental-management and sustainability-related terms, such as environmental management, organizational sustainability, environmental performance, sustainable procurement, and resource efficiency. Broader terms were included when they captured workplace-level or organizational evidence relevant to the review questions, while purely technical, industrial, construction-engineering, urban-infrastructure, or energy-system terms were not used as standalone eligibility anchors unless the study also included a clear organizational, managerial, or employee-related workplace dimension. This strategy was intended to avoid an overly broad sustainability search while retaining studies that did not use the exact term “green office” but addressed substantively comparable workplace-level environmental practices.

Several broader or adjacent concepts were considered during search design, screening, and synthesis, but were not used as unrestricted primary search anchors because they would have expanded the review into the much wider literature on corporate sustainability, environmental policy, building performance, environmental governance, or sustainability reporting in general. Workplace sustainability and sustainable workplaces were considered relevant when they referred to organizational, office-based, or comparable workplace settings. Environmental citizenship behaviour was treated as conceptually related to employee green behaviour and employee pro-environmental workplace behaviour, but only studies addressing behaviour in organizational or work settings were eligible. Environmental, social, and governance (ESG) practices, environmental governance, and organizational environmental performance were treated as broader contextual, governance-related, or outcome-related constructs. They were included when empirically connected with green office practices, Green HRM, employee behaviour, environmental management, workplace sustainability, or organizational sustainability in workplace settings. This boundary preserved the focus of the review while avoiding the exclusion of studies that used different terminology for substantively comparable organizational sustainability practices.

The search was limited to articles published in English from 2010 onwards. Only peer-reviewed original research articles with available full text were considered eligible for inclusion. Google Scholar was used as a supplementary search source and cross-checking tool; results were screened for thematic relevance, peer-reviewed status, and full-text availability, and only records meeting the same eligibility criteria as the database searches were retained for further assessment. The detailed database-specific search strategies are provided in Appendix A.1 (Table A1).

Google Scholar was used only as a supplementary academic search and cross-checking source rather than as a primary bibliographic database. In total, 85 records were identified through Google Scholar using search strings adapted to the technical limitations of this source. These records were entered into the same structured screening table as records

retrieved from Web of Science Core Collection, Scopus, ScienceDirect, Emerald Insight, and PubMed. They were screened against the same predefined eligibility criteria, including peer-reviewed status, original empirical design, English-language publication, full-text availability, organizational or workplace context, and relevance to green office practices, employee green behaviour, Green HRM, environmental management, or organizational sustainability. Duplicate records already identified through the primary and supplementary database searches were removed before screening. The identification, screening, eligibility decisions, and exclusion reasons for Google Scholar records were documented together with all other sources in Supplementary File S2.

2.3. Data Selection and Extraction

All records retrieved from the selected databases and supplementary search sources were collected and organized in a structured screening table. Duplicate records were identified manually by comparing article titles, authors, publication years, journal names, and DOIs, and were removed before screening. The screening table documented the source database, bibliographic information, duplicate status, screening decision, full-text availability, eligibility decision, and main reason for exclusion where applicable. The structure of the screening table and the decision rules used during screening are reported in Supplementary File S2.

The remaining records were screened by title and abstract according to the predefined inclusion and exclusion criteria. Records were excluded at this stage when they were clearly unrelated to environmental management, green office practices, workplace sustainability, employee green behaviour, Green HRM, or organizational sustainability in a relevant organizational or workplace context. Articles that appeared potentially relevant, ambiguous, or borderline were retained for full-text assessment to reduce the risk of premature exclusion.

Full-text assessment examined whether each study provided original empirical evidence and addressed environmental management, green office practices, green workplace practices, employee green behaviour, employee pro-environmental behaviour, Green HRM, or organizational sustainability in an office-based, administrative, service-oriented, public-sector, private-sector, or broader organizational workplace context. Articles were excluded during full-text assessment when they did not provide original empirical evidence, did not address organizational or employee-level environmental practices, were not available in full text, or did not correspond to the thematic scope of the review.

Review articles, conceptual papers, editorials, commentaries, and policy papers were excluded from the thematic synthesis because the purpose of the review was to synthesize original empirical evidence rather than secondary interpretations of previously published studies. This decision also reduced the risk of double-counting evidence from primary studies that may have already been included in earlier reviews. Relevant review articles were nevertheless used in the Introduction and Discussion to position the research gap, differentiate the contribution of the present review from prior syntheses, and contextualize the interpretation of the empirical findings.

Data were extracted using a structured data extraction form. Extracted information included the author(s), year of publication, country or region, research methodology, sample or data source, organizational or workplace context, research focus, key variables, and key findings. Data extraction was conducted descriptively and narratively, without transformation into statistical effect measures, because the included studies used heterogeneous designs, constructs, and outcome indicators.

The final set of included studies was synthesized thematically. To ensure transparency, all selection decisions were documented in the screening table, including the main reason for exclusion at the full-text assessment stage. The detailed search, screening, eligibility assessment log, screening-table fields, and decision rules are provided in Supplementary File S2. The inclusion and exclusion criteria applied during screening and full-text eligibility assessment are presented in Appendix A.2 (Table A2).

2.4. Study Selection

The study selection process followed the PRISMA 2020 framework [41] and included identification, screening, eligibility assessment, and inclusion. Records were first identified through searches in Web of Science Core Collection, Scopus, ScienceDirect, Emerald Insight, PubMed, and Google Scholar. After the initial search, all retrieved records were entered into a structured screening table and checked for duplication before title and abstract screening.

Duplicate records were removed manually by comparing article titles, authors, publication years, journal names, and DOIs. The initial search, duplicate removal, and preliminary title/abstract screening were performed by J.S. using the predefined eligibility criteria. Potentially relevant and borderline records were retained for full-text assessment. The final list of included studies, exclusion categories, and consistency of eligibility decisions were then reviewed by the author team (J.S., A.Š. and D.B.-Š.). Any uncertainties about eligibility or classification were resolved through discussion until consensus was reached. No automation tools, machine-learning classifiers, or crowdsourcing procedures were used in the screening process.

Formal independent double-screening of all records was not performed, and therefore no inter-rater agreement coefficient, such as Cohen's kappa, was calculated. To reduce the risk of selection bias, several procedural safeguards were applied. First, screening was conducted against predefined inclusion and exclusion criteria. Second, records that were potentially relevant, ambiguous, or borderline were retained for full-text assessment rather than excluded at the title-and-abstract stage. Third, the final included studies, exclusion categories, and consistency of eligibility decisions were reviewed by the full author team. Any uncertainty regarding empirical status, organizational or workplace context, thematic relevance, or exclusion category was resolved through discussion until consensus was reached. The absence of formal independent double-screening is acknowledged as a methodological limitation, while the structured screening table and consensus-based author verification were used to improve transparency, traceability, and consistency of the selection process.

Reports that appeared potentially relevant were sought for retrieval and assessed in full text. Full-text assessment focused on whether the studies provided original empirical evidence and addressed environmental management, green office or green workplace practices, employee pro-environmental behaviour, Green HRM, or organizational sustainability in office-based, administrative, service-oriented, public-sector, private-sector, or broader organizational workplace contexts. Full-text reports were also checked for methodological transparency, including clarity of aim, empirical design, sample or data source, data collection procedure, and reported findings.

Studies were excluded at the full-text stage when they did not address an organizational or workplace context, were not original empirical research articles, focused only on technical, architectural, construction-related, urban, industrial, or energy-efficiency aspects without a clear managerial or employee-related dimension, or did not provide sufficient methodological information. The final set of studies included in the review consisted of 22 original empirical studies. The study selection process is presented in Figure 1, and

the same numerical pathway is documented in Supplementary File S2 together with the detailed screening and eligibility documentation.

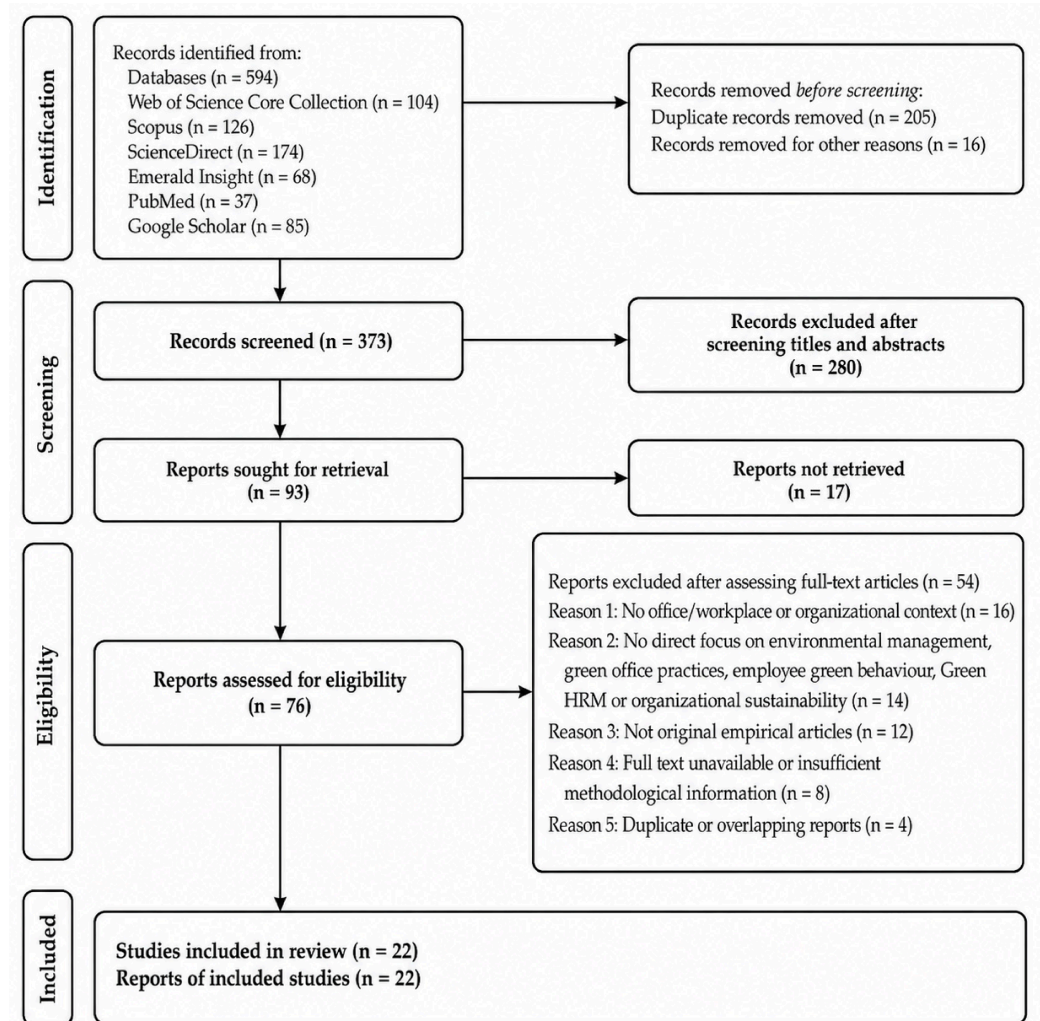


Figure 1. PRISMA flow chart of the literature selection process.

2.5. Quality Appraisal

The methodological quality and thematic relevance of the included studies were assessed using a structured quality appraisal approach developed for this qualitative systematic review. The appraisal criteria were informed by commonly used quality assessment principles for qualitative and mixed-method systematic reviews and adapted to the aims and scope of the present review. Because the included studies differed substantially in design, context, sample characteristics, variables, and analytical procedures, a single statistical risk-of-bias tool was not considered appropriate. The appraisal therefore assessed transparency, relevance, and interpretive credibility rather than producing a pooled risk-of-bias score.

To make the appraisal logic more explicit, the revised explanation clarifies that the criteria were aligned with general appraisal domains used in established quality assessment approaches for heterogeneous empirical evidence, including qualitative, quantitative, and mixed-method review contexts; however, the review did not apply a formal design-specific risk-of-bias score or a pooled quality score. The study-level results of this appraisal are reported in Supplementary File S3. All 22 included studies [42–63] met the minimum criteria for inclusion in the qualitative synthesis and were rated as overall adequate. Several studies were rated as partially adequate only on the criterion

concerning the explanation of data collection and analysis procedures, because reporting details were less extensive than in studies using more fully specified modelling, experimental or mixed-method designs. These reporting limitations were considered during interpretation of the thematic findings rather than used as a numerical weighting mechanism or automatic exclusion criterion.

Each study was assessed against six criteria: (1) clear statement of the research aim; (2) appropriate empirical methodology; (3) clearly described sample, participants, organizational setting, or data source; (4) sufficient explanation of data collection and analysis procedures; (5) clear presentation of findings; and (6) relevance to environmental management, green office practices, employee behaviour, Green HRM, workplace sustainability, or organizational sustainability. For each criterion, the assessment distinguished between adequate, partially adequate, and insufficient reporting.

Studies were retained when they provided an identifiable empirical basis, sufficient methodological information for interpretation, and a clear thematic contribution to at least one review question. Studies were excluded when they lacked empirical data, had no relevant organizational or workplace context, did not address environmental or sustainability-related practices at organizational or employee level, or provided insufficient methodological information for meaningful interpretation. Minor reporting limitations did not automatically lead to exclusion; instead, they were considered during thematic interpretation.

The quality appraisal was conducted alongside full-text eligibility assessment and checked during the final author-team review of the included studies. Its purpose was not to compare studies statistically, but to ensure that the final synthesis was based on methodologically transparent and thematically relevant empirical evidence. Overall, the included studies were considered suitable for thematic synthesis because they reported a clear empirical focus, an identifiable organizational or workplace context, and findings relevant to the objectives of this review.

The quality appraisal criteria and their application are reflected in the screening and eligibility documentation provided in Supplementary File S2 and in the study-level quality appraisal summary provided in Supplementary File S3. No formal GRADE assessment, funnel plot, publication-bias test, or quantitative sensitivity analysis was conducted, as the review did not include a meta-analysis and the evidence was synthesized qualitatively.

The study-level appraisal results are reported in Supplementary File S3 to make the quality assessment transparent at the level of each included study. The appraisal showed that no included study was rated as insufficient overall, while several studies were rated as partially adequate on the criterion concerning the explanation of data collection and analysis procedures. These differences did not lead to statistical weighting, because the review used qualitative thematic synthesis, but they informed the cautious interpretation of findings, particularly where evidence was based on cross-sectional, self-reported, or less fully described empirical designs.

To increase transparency in the main text, Table 1 summarizes the study-level ratings across the six appraisal criteria. The table is intended as a qualitative transparency summary rather than as a numerical weighting or risk-of-bias score. The appraisal criteria were aligned with general appraisal domains used in established quality assessment approaches for heterogeneous empirical evidence, including qualitative, quantitative, and mixed-method review contexts: clarity of aim, appropriateness of empirical design, description of sample or organizational context, transparency of data collection and analysis, clarity of findings and relevance to the review questions. The appraisal was not presented as a formal score from a single validated instrument; instead, it was used as a transparent study-level assessment to support qualitative thematic interpretation.

Table 1. Study-level quality appraisal summary of the included empirical studies.

Study	C1 Aim	C2 Design	C3 Sample/Context	C4 Data/Analysis	C5 Findings	C6 Relevance	Overall
Nieuwenhuis et al. [42]	A	A	A	A	A	A	Adequate
Blok et al. [43]	A	A	A	A	A	A	Adequate
Pasharibu et al. [44]	A	A	A	PA	A	A	Adequate
Fawehinmi et al. [45]	A	A	A	A	A	A	Adequate
Saifulina et al. [46]	A	A	A	PA	A	A	Adequate
Xiao et al. [47]	A	A	A	A	A	A	Adequate
Parida et al. [48]	A	A	A	A	A	A	Adequate
Zhu et al. [49]	A	A	A	A	A	A	Adequate
Mansoor et al. [50]	A	A	A	A	A	A	Adequate
Ribeiro et al. [51]	A	A	A	A	A	A	Adequate
Omarova and Jo [52]	A	A	A	A	A	A	Adequate
Chen and Wu [53]	A	A	A	A	A	A	Adequate
Khan et al. [54]	A	A	A	A	A	A	Adequate
Mohd Razali et al. [55]	A	A	A	PA	A	A	Adequate
Li et al. [56]	A	A	A	A	A	A	Adequate
Ahmad et al. [57]	A	A	A	A	A	A	Adequate
Tandon et al. [58]	A	A	A	A	A	A	Adequate
Rasheed and Rotimi [59]	A	A	A	PA	A	A	Adequate
Alherimi et al. [60]	A	A	A	PA	A	A	Adequate
Carbone et al. [61]	A	A	A	A	A	A	Adequate
Srikolchan et al. [62]	A	A	A	PA	A	A	Adequate
Bangwal et al. [63]	A	A	A	A	A	A	Adequate

Note: A = adequate reporting; PA = partially adequate reporting; I = insufficient reporting. C1 = clear statement of research aim; C2 = appropriate empirical methodology; C3 = clearly described sample, participants, organizational setting or data source; C4 = sufficient explanation of data collection and analysis procedures; C5 = clear presentation of findings; C6 = relevance to green office practices, workplace sustainability, environmental management, Green HRM, leadership, organizational culture, employee green/pro-environmental behaviour or organizational sustainability.

2.6. Data Synthesis

Given the interdisciplinary nature of the included studies, a qualitative thematic synthesis was conducted. The coding process combined deductive and inductive elements. Initial coding was guided by the review questions and by the main constructs identified in the literature: green office practices, employee environmental behaviour, Green HRM, environmental management, workplace characteristics, leadership, organizational support, and organizational sustainability. During repeated readings of the included studies, additional codes were added inductively when recurring concepts, mechanisms, barriers, or contextual conditions emerged from the data.

The initial coding and organization of extracted data were performed by J.S. in a structured extraction and coding table. The thematic categories and interpretation of coding decisions were then reviewed and refined by the author team. Each study could contribute to more than one thematic category when it provided relevant evidence across several domains. The number reported in Appendix A.4 (Table A4) for each thematic category indicates the number of included studies contributing evidence to that category, not the number of individual codes.

The synthesis was developed by comparing study aims, contexts, samples, key variables, findings, and quality appraisal observations. Its purpose was to identify patterns across heterogeneous empirical studies rather than to aggregate statistical effects. No specialized qualitative-analysis software or analytic code was used; the synthesis was conducted through structured extraction, manual coding, thematic grouping, and author consensus. The detailed screening, extraction, PRISMA flow documentation, and coding documentation are summarized in Supplementary File S2.

The integrative conceptual framework was developed after completion of the thematic synthesis through a structured mapping procedure. First, the included studies were coded according to the review constructs and emergent thematic categories. Second, recurring relationships among environmental management, Green HRM, leadership, organizational support, workplace characteristics, employee green behaviour, green office practices, and sustainability-related outcomes were compared across study aims, contexts, variables, and findings. Third, these recurring links were organized into a preliminary framework and reviewed by the author team for coherence with the research questions, consistency with the thematic categories, and traceability to the included empirical studies. This procedure did not constitute external validation of the framework; rather, it provided an internal consistency and evidence-traceability check. The framework should therefore be understood as a synthesis-based conceptual interpretation of the reviewed evidence, not as a statistically tested or externally validated causal model.

2.7. Use of AI Tools

The authors acknowledge the use of AI-assisted tools during the preparation and revision of this manuscript. OpenAI ChatGPT (GPT-5.5 Pro) was used under direct author supervision to support English-language editing, improvement of clarity and coherence, paragraph-level restructuring, and technical refinement of figure presentation. In relation to the figures, ChatGPT was used to assist in translating author-provided content, numerical information, and layout instructions into clearer graphical representations. For Figure 1, the authors provided the PRISMA numerical pathway, box labels, exclusion reasons, and required layout structure; AI assistance was used only to improve the visual arrangement, readability, spacing, alignment of arrows, and consistency of the flow diagram. For Figure 2, the authors provided the conceptual content derived from the thematic synthesis; AI assistance was used to improve the visual organization, spacing, labelling, and readability of the conceptual framework. All numerical values, labels, arrows, figure captions, conceptual relationships, and consistency with the manuscript text were checked, corrected where necessary, and approved by the authors.

DeepL Translator (<https://www.deepl.com/translator>; accessed on 1 July 2026) was used to check and refine the English wording of selected passages. Grammarly (<https://www.grammarly.com/>; accessed on 1 July 2026) was used to support the checking of grammar, spelling, punctuation, and language clarity. No AI tool was used to generate research data, conduct the systematic search, screen records, make eligibility decisions, extract data, perform quality appraisal, code the included studies, analyse the evidence, interpret findings, or draw scientific conclusions. All AI-assisted outputs were critically reviewed, edited, and verified by the authors, who take full responsibility for the accuracy, integrity, originality, and final content of the manuscript.

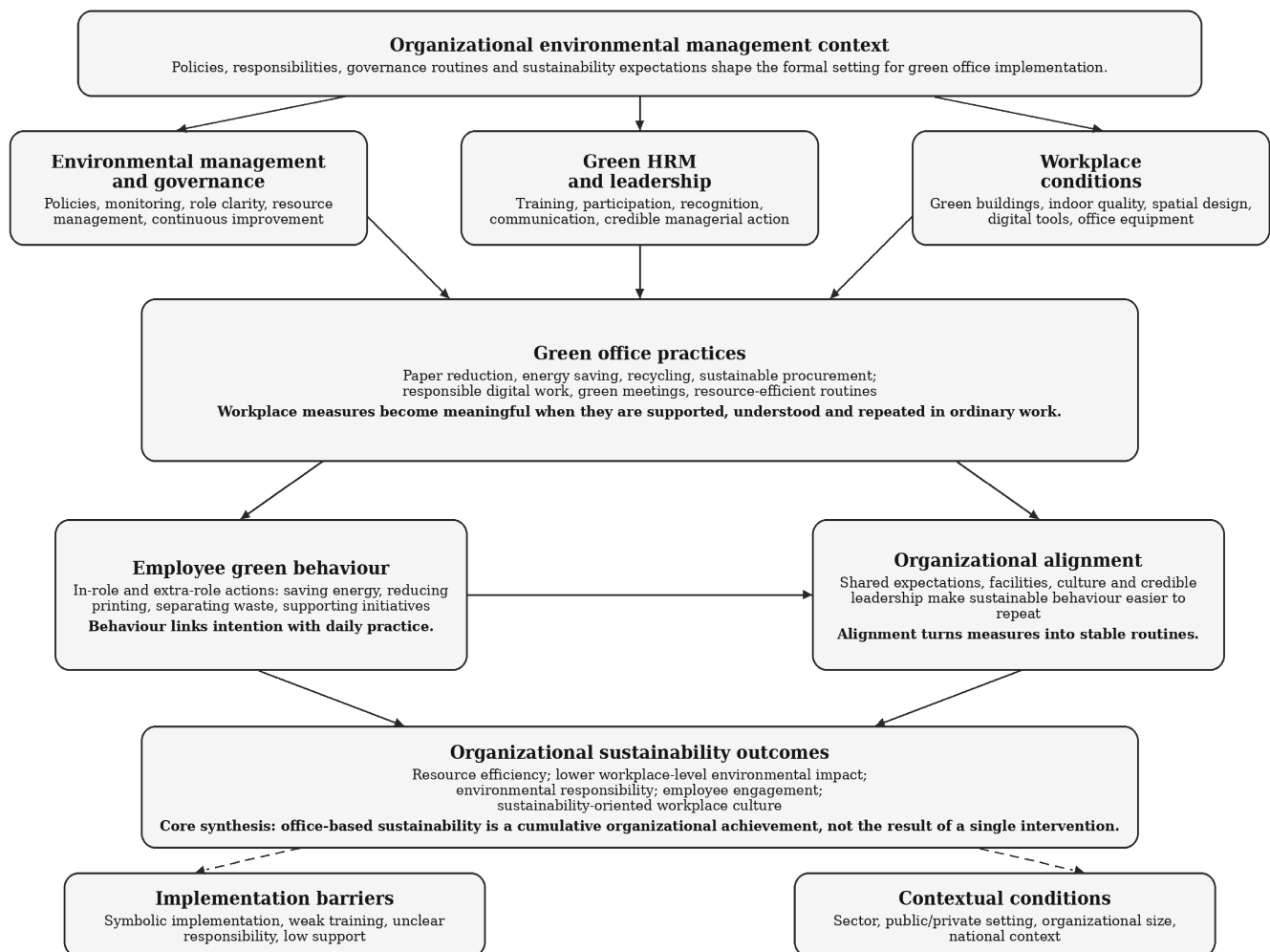


Figure 2. Integrative conceptual framework of green office practices in organizational environmental management. Note: The upper level represents organizational and managerial conditions, the middle level represents workplace-level green office practices and employee enactment, and the lower level represents sustainability outcomes, implementation barriers, and contextual conditions. Contextual conditions include organizational size, sectoral and industry-specific characteristics, ownership structure, workforce demographics, national environmental regulation, institutional setting, and geographical context.

3. Results

3.1. Study Selection Results

The study selection process followed the PRISMA 2020 framework [41] and is presented in Figure 1. The database search identified 594 records from Web of Science Core Collection, Scopus, ScienceDirect, Emerald Insight, PubMed, and Google Scholar. Before screening, 205 duplicate records were removed and 16 records were excluded for other reasons. After this step, 373 records were screened by title and abstract.

During screening, 280 records were excluded because they did not correspond to the thematic scope of the review or did not address environmental management, green office practices, green workplace practices, employee green behaviour, Green HRM, or organizational sustainability in a relevant organizational or workplace context. A total of 93 reports were sought for retrieval, of which 17 could not be retrieved in full text. The remaining 76 full-text reports were assessed for eligibility according to the predefined inclusion and exclusion criteria.

Following full-text assessment, 54 reports were excluded. The main reasons for exclusion were the absence of an office-based, workplace, or organizational context; insufficient focus on environmental management, green office practices, employee green behaviour, Green HRM, or organizational sustainability; non-empirical study design; unavailable or insufficient full-text information; and duplicate or overlapping full-text versions. The final sample consisted of 22 original empirical studies that met all inclusion criteria and were included in the thematic synthesis.

For reporting transparency, the main reasons for full-text exclusion are summarized in the main manuscript. Of the 54 full-text reports excluded after eligibility assessment, 16 were excluded because they did not focus on office-based organizations, workplace contexts, or organizational settings; 14 because they did not directly address environmental management, green office practices, employee green behaviour, Green HRM, or organizational sustainability; 12 because they were not original empirical research articles; 8 because the full text was unavailable or the methodological information was insufficient; and 4 because they were duplicate full-text versions or overlapping reports. In addition, the quality appraisal results showed that all 22 included studies provided a sufficient empirical and thematic basis for qualitative synthesis and were rated as overall adequate. Several studies were rated as partially adequate on the criterion concerning the explanation of data collection and analysis procedures; these reporting limitations were considered during interpretation of the thematic findings. Detailed screening, eligibility, PRISMA, and study-level quality appraisal documentation are provided in Supplementary Files S2 and S3.

The relatively small final sample should be interpreted in relation to the deliberately focused eligibility criteria of the review. The review did not aim to include all literature on workplace sustainability, green buildings, environmental policy, or Green HRM in general, but only original empirical studies that provided evidence relevant to green office practices, employee environmental behaviour, Green HRM, environmental management, or organizational sustainability within an identifiable organizational or workplace context. This focus increased conceptual relevance for the review questions and strengthened the coherence of the qualitative thematic synthesis. At the same time, it means that the review may not capture all adjacent literature addressing sustainability issues indirectly, conceptually, technically, or outside an organizational workplace setting. The final sample is therefore best understood as a focused empirical evidence base for qualitative thematic synthesis rather than as a fully representative map of the entire workplace sustainability literature.

Some relevant studies from adjacent fields may not have been included because they did not meet the predefined eligibility criteria or did not provide a sufficiently explicit organizational, workplace, employee-related, or office-based focus. This particularly applies to broader studies on corporate sustainability, environmental governance, sustainable buildings, environmental performance, or environmental, social, and governance practices that address sustainability at a strategic, technical, policy, or reporting level without connecting it to workplace routines, Green HRM, employee behaviour, or green office implementation. The exclusion of such studies reflects the conceptual boundary of the review rather than an assessment of their scholarly value or relevance to sustainability research more broadly. These adjacent studies remain important for contextualizing the findings, but they were not included in the thematic synthesis unless they provided direct empirical evidence relevant to the review questions.

3.2. Characteristics of Studies

The final sample consisted of 22 original empirical studies that met the predefined inclusion criteria. The studies were published from 2010 onwards and covered different organizational and workplace contexts, including office-based organizations, public-sector organizations, service-oriented workplaces, university settings, green office buildings, and broader organizational environments. Geographically, the studies were conducted in diverse regional contexts, including Europe, Asia, New Zealand, and the Middle East, reflecting the interdisciplinary and international scope of research on green office practices, employee environmental behaviour, Green HRM, and organizational sustainability.

The geographical distribution of the final sample was uneven. Although the included studies covered several countries and regions, a substantial part of the empirical evidence originated from Asian organizational contexts, whereas North American, African, Latin American, and several European office-based contexts were absent or only weakly represented. This distribution was considered during interpretation, because geographical and institutional settings may influence the strength, direction, and transferability of relationships between Green HRM, leadership, organizational support, workplace design, employee green behaviour, and sustainability-related outcomes.

The included studies used different empirical designs, with a predominance of quantitative survey-based studies, structural equation modelling, cross-sectional designs, and selected field or case-based approaches. Samples mainly included employees, office workers, organizational staff, public-sector employees, and workers in green or sustainable workplace environments. The main characteristics of the included studies are presented in Appendix A.3 (Table A3).

The study characteristics were used not only for descriptive reporting, but also to inform the comparative interpretation of the evidence. Differences in geographical setting, organizational sector, workplace context, sample composition, research focus, and methodological design were considered when interpreting the thematic findings. Survey-based Green HRM and employee behaviour studies mainly supported associations between managerial practices, organizational climate, motivation, and behavioural outcomes, whereas green building and indoor environmental quality studies provided more context-specific evidence on workplace experience, comfort, perceived productivity, and employee well-being. Public-sector and government-office studies contributed particularly to understanding awareness, participation, training, communication, organizational support, and implementation conditions. This comparative use of the study-characteristics table helped distinguish between broadly recurring patterns and findings that were more dependent on sectoral, regional, or methodological context.

3.3. Thematic Categories and Coding Framework

To support the thematic synthesis, the included studies were analysed using a structured coding framework. The coding process was focused on identifying recurring concepts, patterns, and relationships related to green office practices, employee environmental behaviour, Green HRM, environmental management, and organizational sustainability. The analysis resulted in several thematic categories that provided the basis for the subsequent synthesis of findings.

The thematic categories were not treated as isolated constructs, but as interconnected dimensions of organizational environmental management. This approach enabled the synthesis to capture both practical workplace-level measures and broader organizational mechanisms. The coding process resulted in seven thematic categories: (1) green office practices and workplace sustainability; (2) employee environmental behaviour;

(3) Green HRM; (4) green leadership and organizational support; (5) environmental management and governance; (6) organizational sustainability outcomes; and (7) implementation barriers and contextual conditions. The complete coding framework, including the coding focus, codes and subcodes, and analytical meaning of each category, is provided in Appendix A.4 (Table A4).

3.4. Thematic Synthesis of Findings

The thematic synthesis was developed from the structured coding framework summarized in Appendix A.4 (Table A4) and was used to move beyond a descriptive listing of individual studies. The aim was to identify how the included studies collectively explain the relationship between green office practices, employee environmental behaviour, Green HRM, environmental management, and organizational sustainability. The numbers reported in Appendix A.4 (Table A4) indicate the number of included studies in which a given category appeared as a central or supporting analytical theme; they should therefore be interpreted as indicators of thematic recurrence rather than as statistical effect measures.

The frequency values reported for thematic categories should be interpreted cautiously. They indicate the number of included studies contributing evidence to a given thematic category, not the number of individual codes, statistical effects, or independent observations. Because one study could contribute to more than one category, these values are not mutually exclusive and should not be read as measures of relative importance or effect strength. Instead, they were used descriptively to indicate thematic recurrence across the evidence base. The interpretation of each theme was based not only on frequency, but also on study context, methodological design, quality appraisal observations, and the substantive relevance of the findings to the review questions.

To make the link between thematic categories and the underlying evidence more transparent, a thematic evidence matrix is provided in Appendix A.5. The matrix summarizes the main supporting studies, dominant type of evidence, interpretation, and main limitations for each thematic category.

The interpretation of results therefore draws jointly on the study-characteristics table, the study-level quality appraisal, and the thematic evidence matrix. Table A3 was used to compare the included studies by country or region, organizational context, methodology, sample, and research focus. Supplementary File S3 was used to consider whether differences in reporting quality or methodological transparency affected the cautious interpretation of findings. Appendix A.5 was used to connect each thematic category with the main supporting studies, dominant type of evidence, interpretation, and limitations. Together, these elements support a more analytical reading of the results by showing where findings are supported across different contexts and methods, and where they remain concentrated in particular sectors, regions, or research designs.

The first thematic pattern concerns the organizational character of green office practices. The included studies show that green office practices are not limited to visible environmental measures such as recycling, paper reduction, energy saving, or green workplace routines. Studies by Nieuwenhuis et al. [42], Pasharibu et al. [44], Parida et al. [48], Mohd Razali et al. [55], Rasheed and Rotimi [59], and Srikolchan et al. [62] indicate that such practices are shaped by the interaction between the physical workplace, organizational support, employee awareness, and everyday work routines. Green office implementation therefore appears as a practical organizational process rather than a purely technical intervention.

The second pattern concerns employee environmental behaviour. Across the included studies, employee green behaviour appears as a behavioural enactment pathway through which environmental intentions enter daily organizational routines. Blok et al. [43], Fawehinmi et al. [45], Xiao et al. [47], Zhu et al. [49], Ribeiro et al. [51], Alherimi et al. [60], Carbone et al. [61], and Bangwal et al. [63] indicate that pro-environmental workplace behaviour is associated with individual motivation, moral norms, organizational identification, green climate, environmental commitment, and organizational support. This finding positions employees not only as recipients of environmental policies, but as participants in workplace-level sustainability practice.

The third pattern concerns Green HRM and leadership as organizational enablers. The synthesis shows that Green HRM practices, environmental leadership, and organizational culture provide conditions under which green behaviour becomes more likely and more stable. Saifulina et al. [46], Zhu et al. [49], Mansoor et al. [50], Omarova and Jo [52], Chen and Wu [53], Li et al. [56], Ahmad et al. [57], and Tandon et al. [58] indicate that HRM practices, leadership support, green organizational identity, and employee engagement are closely related to environmental behaviour and broader organizational outcomes. These studies suggest that environmental management in office-based organizations cannot be separated from people-management systems and leadership practices.

The fourth pattern connects workplace-level practices with broader environmental management and organizational sustainability. Evidence from studies on green office buildings, Green HRM, employee-related outcomes, pro-environmental actions, and green workplace practices indicates that office-level practices become strategically relevant when they are embedded in organizational routines, governance processes, and sustainability-oriented performance expectations [48,58,60,61]. Their contribution is therefore not limited to resource reduction. They may also be associated with environmental responsibility, employee engagement, green creativity, organizational reputation, and the gradual development of a sustainability-oriented workplace culture.

The final pattern concerns implementation barriers and contextual conditions. Studies on public offices, government organizations, and green office participation indicate that implementation is uneven when institutional support is weak, employee awareness is low, training is limited, responsibilities are unclear, or organizational contexts differ substantially [43,44,55,62,63]. This explains why green office practices cannot be evaluated only as discrete interventions. They need to be interpreted together with behavioural enactment, HRM, leadership, workplace conditions, and the organizational setting in which they are introduced. These thematic findings provide the empirical basis for the discussion that follows.

This synthesis indicates that the green office is best interpreted less as a discrete intervention and more as a workplace-level configuration of environmental management, behavioural enactment, HRM, leadership, and organizational routines. Collectively, these findings suggest that green office sustainability is a multidimensional organizational phenomenon shaped by the interaction between workplace participation, managerial support, environmental conditions, and the broader organizational context.

Although the thematic synthesis revealed several convergent patterns, the evidence base was uneven across themes, contexts, and methodological designs. The most consistent evidence concerned associations between Green HRM, leadership, organizational support, green climate, environmental commitment, and employee green behaviour, particularly in quantitative cross-sectional studies. By contrast, the evidence was weaker and less direct for long-term organizational change, objectively measured environmental performance, and the measurable environmental effects of green office practices. Direct contradictory findings were not prominent in the included studies; however, this should be interpreted

cautiously because the studies used different constructs, samples, organizational settings, analytical approaches, and outcome measures. The synthesis therefore compared not only whether findings were positive, but also the type, strength, and context of the evidence. Public-sector and government-office studies tended to emphasize awareness, participation, training, communication, and organizational support. Studies on green buildings and indoor environmental quality focused more strongly on employee perceptions, comfort, well-being, and workplace experience. Studies grounded in Green HRM and leadership research mainly examined psychological and behavioural mechanisms, including organizational identification, environmental commitment, green climate, and motivation. These differences suggest that green office practices should not be interpreted as producing uniform effects across organizational settings. Rather, their implementation and outcomes appear to depend on the interaction between managerial systems, workplace conditions, employee behaviour, sectoral context, and the methodological design through which these relationships are examined.

4. Discussion

This review brings together evidence from office-based and broader organizational workplace settings to clarify how green office practices operate in practice. The discussion is grounded primarily in the 22 empirical studies included in the synthesis. Wider theoretical, review-based, and comparative literature is used only where it helps interpret the patterns identified in those studies or place them within the broader sustainability debate.

To avoid overstating the evidence, the discussion distinguishes between findings directly supported by the 22 included empirical studies and broader interpretive implications derived from their thematic comparison. The included studies most consistently support associations among Green HRM, leadership, organizational support, workplace conditions, employee green behaviour, and sustainability-related outcomes. They provide less direct evidence on causal pathways, long-term organizational change, and objectively measured environmental performance. For this reason, the discussion and the proposed framework should be read as an integrative interpretation of the available empirical evidence rather than as a validated causal model. Where wider theoretical and review-based literature is cited, it is used only to contextualize or explain the patterns identified in the included empirical studies. In addition, several statements in the Discussion have been revised to use more cautious language, particularly where the evidence supports association or thematic convergence rather than causal inference.

The discussion therefore interprets the findings through three complementary theoretical mechanisms. From an ability, motivation, and opportunity perspective, green office practices are more likely to be enacted when employees have the ability to understand environmental expectations, the motivation to participate, and the opportunity to act through accessible routines, supportive infrastructure, and participatory practices. From a social-exchange perspective, employee green behaviour appears more credible when organizations provide visible support, fair expectations, managerial consistency, and recognition, because employees may then interpret sustainability as a shared organizational commitment rather than as an additional individual burden. From an institutional perspective, green office practices are shaped by regulatory, ESG-related, reputational, and organizational pressures, but these pressures require translation into workplace-level routines if they are to influence daily behaviour. These mechanisms help explain why similar green office measures may produce different outcomes across organizational settings.

Across the included studies, green office practices appear to become meaningful when they are connected with the way work is organized. Recycling schemes, paperless routines, green buildings, and indoor environmental improvements are useful, but they may be less likely to last if employees do not understand them, managers do not support them, or organizational systems do not reinforce them. This interpretation is consistent with wider work on Green HRM and employee green behaviour, which links sustainability to participation, managerial support, and the embedding of environmental values in everyday work [2,9,40].

4.1. Green Office Practices as an Organizational Rather than Merely Technical Construct

In relation to RQ1, the evidence points to two complementary understandings of green office practices. One is concrete and operational: energy saving, paper reduction, recycling, responsible use of office equipment, resource-efficient routines, environmentally responsible procurement, and attention to indoor environmental quality. The other is organizational: green office practices appear to depend on environmental management, employee participation, green workplace culture, and Green HRM systems.

The studies most directly focused on green offices and green workplace environments support this dual understanding. Pasharibu et al. [44] identified dimensions of green office implementation in public-sector office settings and indicated that implementation depends on organizational support and employee awareness. Mohd Razali et al. [55] similarly emphasized employee awareness and acceptance in government organizations. Srikolchan et al. [62] reported that participation in green office operation is influenced by training, communication, collaboration, and recognition. These findings suggest that green office practices require explanation, coordination, support, and reinforcement; they do not implement themselves.

The physical workplace is also relevant, but it cannot carry the sustainability agenda on its own. Nieuwenhuis et al. [42] reported that green office space can improve perceived air quality, satisfaction, and productivity compared with lean office space. Rasheed and Rotimi [59] indicated that workers' perceptions of indoor environmental quality matter in green office environments. Parida et al. [48] linked green office buildings with Green HRM and employee outcomes, suggesting that buildings and people-management practices interact rather than operate separately. This is consistent with wider workplace literature suggesting that green buildings and indoor environmental quality can influence employee health, satisfaction, productivity, and cognitive function [30,35,36].

Collectively, these findings support a broader reading of green office practices. They include physical and operational measures, but their effectiveness appears to depend on employee behaviour, leadership, HRM, and organizational culture. A green office can therefore be understood not simply as a certified building, a recycling programme, or a paperless policy; it is a work environment in which sustainability is translated into ordinary routines.

In our interpretation, this is the point at which the green office becomes analytically useful: it allows the review to connect visible workplace measures with the less visible organizational conditions that may make those measures more durable. We therefore read the green office not as a label for environmentally improved space, but as an indicator of whether environmental management has entered ordinary work organization.

This organizational understanding of green office practices leads directly to the behavioural dimension of the review: how employees interpret, adopt, and enact these practices in everyday work.

4.2. Employee Green Behaviour as the Behavioural Mechanism of Office-Based Sustainability

RQ2 concerned how workplace-level behaviour relates to organizational sustainability. The included studies indicate that employee green behaviour may function as the everyday enactment of environmental management at work. Rather than treating it as an isolated outcome, this review interprets it as a set of routine actions, such as saving energy, limiting printing, separating waste, supporting green initiatives, and reinforcing environmentally responsible norms, that connect formal intentions with practice.

Several included studies support this interpretation. Fawehinmi et al. [45] reported that Green HRM and personal moral norms are associated with employee green behaviour. Xiao et al. [47] found that employee-organization fit and green organizational climate are linked to voluntary green behaviour. Zhu et al. [49] indicated that Green HRM is associated with employee green behaviour through environmental belief and green organizational identity. Ribeiro et al. [51] found that Green HRM is associated with eco-friendly behaviour through organizational identification. These findings suggest that employee green behaviour is not only an individual trait; it is also shaped by the organization.

The wider literature helps explain this pattern. Boiral and Paillé [10] conceptualized environmental citizenship behaviour as voluntary conduct that contributes to environmental goals beyond formal requirements. Paillé et al. [11] linked environmental management practices with such behaviour through social exchange. Norton et al. [12] emphasized the multilevel nature of employee green behaviour, while Katz et al. [13] confirmed its relevance through meta-analytic evidence. From this perspective, office-based sustainability cannot be reduced to policy; it depends on the cumulative effect of employee action.

The evidence suggests three related roles. Operationally, such behaviour may support resource efficiency and waste reduction. Culturally, it may strengthen environmental awareness and shared responsibility. Strategically, it may help organizations move from declarative sustainability commitments toward embedded practice. In office-based organizations, these roles are particularly relevant because sustainability-related outcomes may depend on accumulated small-scale routines rather than on major technological interventions.

Accordingly, the key issue is not behaviour in isolation, but the organizational conditions that make repeated enactment credible, convenient, and socially supported.

However, employee enactment does not occur in isolation; it depends on the managerial, cultural, and workplace conditions that make green behaviour understandable, supported, and repeatable.

4.3. The Role of Green HRM, Leadership, Organizational Culture, and Workplace Characteristics

RQ3 focused on Green HRM, leadership, organizational culture, and workplace characteristics. Across the included studies, these factors are not simply background conditions. They appear to shape whether employees understand green office practices, accept them as meaningful, and carry them into daily work.

Green HRM is one of the clearest recurring mechanisms in the included studies. Saifulina et al. [46] reported that Green HRM is associated with employee pro-environmental behaviour at work. Zhu et al. [49] indicated that Green HRM is associated with employee green behaviour through environmental belief and green organizational identity. Chen and Wu [53] found that Green HRM and green transformational leadership jointly facilitate employee green behaviour. Li et al. [56] reported that Green HRM practices are linked to employee green in-role behaviour and that spiritual leadership strengthens this relationship. These studies suggest that Green HRM provides part of the human and behavioural infrastructure through which environmental objectives become work practices.

Leadership is also visible in the evidence. Mansoor et al. [50] reported that green transformational leadership and management initiatives stimulate employees' green creativity. Omarova and Jo [52] indicated that environmental transformational leadership and Green HRM influence employee pro-environmental behaviour. Chen and Wu [53] further suggested that leadership and HRM practices operate together. These findings are consistent with broader evidence suggesting that leaders shape pro-environmental behaviour by influencing values, motivation, and perceived responsibility [15,16].

Organizational culture and climate help explain whether green behaviour becomes normal rather than exceptional. Xiao et al. [47] reported that green organizational climate strengthens the relationship between employee-organization fit and voluntary green behaviour. Ahmad et al. [57] linked workplace pro-environmental behaviour with Green HRM and organizational culture. Carbone et al. [61] emphasized that employees can contribute to green workplace behaviours when organizational conditions support such contribution. These findings suggest that culture is not a soft add-on, but a condition that may make environmental responsibility part of ordinary work.

Workplace characteristics complete this picture. Green buildings, indoor environmental quality, plants, ventilation, spatial design, and perceived workplace comfort may influence employee well-being and readiness to participate in sustainability practices. Nieuwenhuis et al. [42] and Rasheed and Rotimi [59] provide evidence that workplace characteristics are relevant for perceptions and outcomes. At the same time, Altomonte and Schiavon [32] and Newsham et al. [33] caution that green certification and green building status do not automatically guarantee a better user experience. The organizational use of the workplace remains essential.

These findings also point to an important tension in the evidence. Green buildings, indoor environmental quality improvements, and visible green office features may support employee satisfaction, comfort, and perceived productivity, but they do not automatically generate sustained green behaviour or measurable organizational sustainability outcomes. Conversely, Green HRM, leadership, and organizational culture may encourage employee participation, but their effects may remain limited if employees lack practical facilities, clear procedures, or credible environmental governance. The contradictory or uneven findings can therefore be interpreted less as disagreement about whether green office practices matter, and more as evidence that their effects depend on alignment between physical workplace conditions, managerial systems, employee agency, and institutional or sectoral context.

The evidence therefore suggests that an isolated-variable interpretation is limited. Green HRM, leadership, culture, and workplace characteristics appear to operate together: HRM can embed expectations into people-management systems; leadership can give green practices visibility; culture can make them socially acceptable; and the workplace can provide the physical conditions in which behaviour takes place.

From the authors' perspective, the important issue is not which of these factors is strongest in isolation, but how they reinforce one another. Green HRM without credible leadership may remain procedural; leadership without supportive routines may remain rhetorical; and a well-designed workplace without employee involvement may remain underused. The review therefore suggests a relational reading of green office effectiveness.

These enabling conditions also help explain why implementation varies across organizations and why similar green office measures may produce different levels of employee participation and sustainability-related outcomes.

The reviewed evidence also helps explain why some organizational factors appear more influential than others in shaping employee green behaviour. Green HRM and leadership seem to have stronger explanatory value because they operate close to the motivational,

normative, and behavioural mechanisms through which employees decide whether green practices are meaningful, expected, and supported. Green HRM embeds environmental expectations into training, participation, performance-related routines, and employee development, while leadership gives these expectations visibility, credibility, and social legitimacy. Organizational culture and climate are influential when they normalize green behaviour and reduce the perception that sustainability is an additional or optional task. Workplace design and indoor environmental quality are important enabling conditions, but their influence appears more indirect: they can make sustainable behaviour easier, more convenient, and more comfortable, but they do not necessarily produce sustained employee green behaviour unless supported by managerial routines, employee involvement, and credible environmental governance. For this reason, the most influential factors are not necessarily the most visible, such as green buildings or physical office features, but those that most directly shape employees' ability, motivation, opportunity, and perceived legitimacy to act sustainably in everyday work.

Although the heterogeneity of the included studies does not allow a statistical ranking of antecedents, it does permit a qualitative comparison of their relative influence. Green HRM and leadership appear to have the most direct influence on employee green behaviour because they shape employees' ability, motivation, opportunity, perceived responsibility, and interpretation of organizational environmental priorities. Organizational support, green climate, and organizational culture appear to have a mainly reinforcing and sustaining influence: they make green behaviour socially legitimate, reduce the perception of sustainability as an additional task, and support its repetition over time. Workplace design, indoor environmental quality, and visible green office features appear to have a more indirect but still important influence. They can make sustainable behaviour easier and more convenient, but their effect depends on whether employees are encouraged, enabled, and organizationally supported to use these conditions in environmentally responsible ways. Thus, the relative influence of the antecedents should be understood functionally rather than hierarchically: Green HRM and leadership are more directly connected with behavioural activation, organizational support and culture with behavioural maintenance, and workplace design with practical enablement.

4.4. Drivers and Barriers in the Implementation of Green Office Practices

RQ4 addressed implementation. The most frequently reported drivers across the included studies are employee awareness, training, participation, leadership support, Green HRM practices, organizational identification, green organizational climate, environmental commitment, and recognition.

Pasharibu et al. [44] and Mohd Razali et al. [55] highlight employee awareness and organizational support as important conditions for green office implementation. Srikolchan et al. [62] add training, communication, collaboration, and recognition as factors that influence participation in green office operation. Fawehinmi et al. [45] point to personal moral norms, while Ribeiro et al. [51] emphasize organizational identification. Bangwal et al. [63] indicate that Green HRM and environmental commitment are associated with employee pro-environmental behaviour. Successful implementation may therefore depend on both organizational design and the meaning employees attach to green practices.

The barriers are equally instructive. Green office practices may be weakened when environmental responsibility remains symbolic, when employees receive little training, when leadership support is inconsistent, when green practices are not integrated into HRM systems, or when employees perceive them as extra tasks rather than as part of normal work. Yuriev et al. [38] similarly identified organizational constraints, lack of sup-

port, and motivational limitations as relevant to workplace pro-environmental behaviour. Unsworth et al. [18] further argued that behaviour-change interventions may be less effective when they do not address the reasons behind employee behaviour.

The main implication is that drivers and barriers appear to be substantially organizational, even when they are expressed through individual behaviour. Employees may be willing to behave sustainably, but they need credible leadership, clear expectations, practical facilities, and a culture that makes green behaviour normal. Weak managerial support, limited awareness, lack of training, unclear responsibilities, poor HRM integration, and symbolic implementation can all undermine green office initiatives.

Our reading of the evidence is that implementation difficulties may arise less from employees rejecting sustainability and more from organizations underestimating the work required to make green practices understandable, convenient, legitimate, and consistently supported. This may shift attention from blaming individual behaviour to examining the managerial conditions under which sustainable behaviour becomes realistic.

The implementation evidence therefore provides the basis for examining how green office practices may connect with broader organizational sustainability goals.

4.5. Linking Green Office Practices with Broader Organizational Sustainability

RQ5 considered the connection between green office practices and broader organizational sustainability. The synthesis suggests a possible alignment pathway: green office practices express environmental management at workplace level; daily routines enact these practices; and Green HRM, leadership, culture, and workplace characteristics may help sustain them over time.

To avoid treating sustainability outcomes as a single undifferentiated category, the reviewed evidence should be interpreted across three outcome levels. First, behavioural outcomes refer to employee green behaviour, pro-environmental workplace behaviour, environmental awareness, participation in green activities, and willingness to integrate sustainability into everyday work routines. Second, organizational outcomes refer to changes in organizational support, green climate, employee engagement, organizational identity, sustainability-oriented culture, reputation, green creativity, and the integration of environmental expectations into HRM and managerial practices. Third, environmental performance outcomes refer to more direct and measurable environmental improvements, such as reduced energy use, paper consumption, waste generation, resource use, emissions, or improved environmental performance indicators. The reviewed studies provide relatively consistent evidence for behavioural and organizational outcomes, but more limited and less directly comparable evidence for objective environmental performance outcomes. Therefore, the findings suggest that organizational practices may create the behavioural and organizational conditions under which environmental improvements become more likely, but the available evidence does not allow a strong causal conclusion that such practices directly produce measurable environmental improvements in all contexts. This distinction is important because employee green behaviour and organizational sustainability culture should not be equated automatically with verified environmental performance.

The included studies provide evidence for this interpretation. Parida et al. [48] linked green office buildings, Green HRM, employee outcomes, and sustainability. Tandon et al. [58] indicated that Green HRM may generate both green and non-green outcomes in the tourism context, suggesting that environmental practices may have broader organizational effects. Alherimi et al. [60] indicated that employee pro-environmental behaviour is influenced by organizational context. Carbone et al. [61] emphasized that employees can make a difference when green workplace behaviours are supported by organizational conditions.

This distinction matters because organizational sustainability is often discussed at a strategic level, while green office practices are treated as operational details. The synthesis suggests that this separation may be limited. In office-based organizations, sustainability may be enacted through ordinary routines. Paper reduction, recycling, energy saving, green procurement, responsible use of digital tools, and attention to indoor environmental quality may appear minor when considered separately, but together they may contribute to organizational environmental responsibility. With support from HRM, leadership, and culture, these practices may also strengthen employee engagement, organizational identity, and sustainability-oriented change.

Green office practices and environmental management appear to be linked to organizational sustainability through their combined influence on resource efficiency, workplace-level participation, employee engagement, workplace culture, and environmental responsibility. Office-based sustainability does not appear to be produced by a single intervention; it may develop through alignment between practices, behaviour, HRM, leadership, culture, and environmental management.

We therefore interpret office-based sustainability as a cumulative organizational achievement. Its effects do not appear to be produced by one policy, one building feature, or one HRM practice, but by repeated alignment of modest practices that may gradually shape how responsible work is understood and performed. This cumulative character is precisely why green office practices deserve more attention in organizational sustainability research. Based on the thematic synthesis of the reviewed studies, this article proposes an integrated conceptual framework of green office sustainability. The framework illustrates how Green HRM, leadership, and organizational support may create conditions for sustained workplace-level enactment and green office implementation. When embedded in broader environmental management and governance structures, these practices may contribute to sustainability-related outcomes, while implementation barriers and contextual conditions may strengthen or weaken these relationships at different stages.

In the conceptual framework, these contextual factors are not treated as direct antecedents equivalent to Green HRM, leadership, or organizational support, but as boundary conditions that may shape the feasibility, intensity, and transferability of green office implementation. Organizational size may influence the availability of resources, the degree of procedural formalization, monitoring capacity, and the institutionalization of environmental routines. Sectoral and industry-specific characteristics may affect which green office practices are most relevant, how strongly organizations are exposed to stakeholder expectations, and whether sustainability is driven mainly by resource efficiency, reputation, compliance, or employee participation. Ownership structure may shape governance priorities, accountability mechanisms, investment capacity, and the balance between compliance-oriented and strategy-oriented sustainability practices. Workforce demographics may influence environmental awareness, digital work habits, participation preferences, perceived responsibility, and responsiveness to Green HRM and leadership initiatives. National environmental regulation and institutional maturity may determine the external pressure under which green office practices are adopted and the extent to which environmental responsibilities are formally embedded in organizational procedures. These context-specific variables are therefore incorporated into the framework as conditions that may moderate the relationship between organizational practices, employee green behaviour, green office implementation, and sustainability-related outcomes. Because the included studies did not provide sufficiently comparable evidence to test these moderating effects, the framework presents them as theoretically and empirically plausible contextual conditions rather than as statistically validated moderators.

4.6. Contribution of the Review and Positioning in Relation to Previous Literature

This review contributes by bringing green office practices into dialogue with several related but often separate fields: Green HRM, employee green behaviour, green buildings, indoor environmental quality, leadership, and organizational sustainability. When the focus is office-based environmental management, these studies need to be read together rather than as parallel discussions.

The theoretical contribution of this review is threefold. First, it reframes green office practices as an integrative workplace-level construct rather than as a narrow set of operational environmental measures. This makes it possible to connect physical workplace conditions, environmental management, HRM systems, leadership, organizational culture, and employee routines within one analytical frame. Second, it clarifies the bridging role of employee green behaviour between formal environmental management and everyday office work. In this interpretation, employee behaviour is not treated only as an individual outcome, but as a practical route through which organizational sustainability intentions may become embedded in daily routines. Third, the review contributes to organizational sustainability research by conceptualizing office-based sustainability as an alignment process involving managerial systems, workplace design, employee agency, and environmental governance. The proposed framework therefore does not merely combine previously studied constructs, but organizes them into a synthesis-based explanation of how green office sustainability may be supported in office-based and broader organizational workplace settings.

This positioning is consistent with recent review literature. Amrutha and Geetha [26] drew attention to the sustainability implications of Green HRM. Miah et al. [27] indicated that Green HRM remains closely connected with sustainability. Zhang et al. [39] suggested that employee green behaviour is a growing but conceptually dispersed research field. Gkikas et al. [29] indicated that HRM, employee green behaviour, and environmental performance are increasingly connected in bibliometric patterns. The present review extends this discussion by focusing on green office and workplace practices as the setting in which these constructs meet, while also recognizing employee-level evidence linking HRM and environmental performance [63].

The point is not only theoretical. Office-based organizations are often perceived as less environmentally intensive than industrial or manufacturing organizations, yet their cumulative footprint can be substantial through energy use, digital infrastructure, paper consumption, procurement, commuting, workspace management, and employee routines. They also shape norms, expectations, and managerial habits that influence sustainability culture. Green office practices therefore offer a visible test of how seriously sustainability is embedded in organizational life.

The added value of this review is thus not the claim that these constructs have never been studied before, but the argument that their separation weakens understanding of office-based sustainability. By placing them in the same analytical frame, the review suggests that green office practices can serve as a practical meeting point between environmental management, people management, and employee agency.

Figure 2 presents the authors' integrative conceptual interpretation of the synthesis. The framework suggests that green office practices should not be understood as isolated technical measures, but as a workplace-level expression of environmental management. Their effectiveness may depend on the extent to which environmental goals are supported by Green HRM, leadership, organizational culture, workplace conditions, and employee participation. The figure therefore makes explicit the central interpretation of this review: green offices may become organizationally meaningful when formal environmental policies are converted into repeated work routines and when employ-

ees are enabled to act sustainably in ordinary work situations. In this sense, employee green behaviour may be understood not simply as an additional outcome of green office practices, but as a practical mechanism through which those practices may contribute to organizational sustainability.

The framework should be interpreted as an explanatory synthesis-based model rather than as a statistically tested causal model. Its logic is based on three interrelated pathways. First, environmental management and governance provide the formal direction for green office implementation through policies, monitoring routines, resource-use expectations, and sustainability responsibilities. Second, Green HRM, leadership, organizational culture, and organizational support translate these formal expectations into employee-facing practices through training, participation, communication, recognition, and managerial modelling. Third, employee green behaviour represents the enactment pathway through which green office practices are incorporated into daily work routines. Feedback may occur when repeated employee participation strengthens green workplace norms, increases organizational learning, and improves the credibility of environmental management. Conversely, weak support, symbolic implementation, unclear responsibilities, or poor alignment between formal policy and daily practice may weaken the pathway from environmental management to sustainability-related outcomes. In this sense, the framework explains green office sustainability as an alignment process among governance, people-management systems, workplace practices, and employee enactment, rather than as a linear effect of one isolated intervention.

The framework extends previous knowledge by bringing together research streams that are often examined separately: formal environmental management and organizational sustainability, Green HRM and employee green behaviour, workplace design and indoor environmental quality, and implementation barriers in office-based organizations. Its contribution is therefore not to introduce a new isolated variable, but to specify how these elements operate together as an office-based sustainability system. The logic of the framework is conditional and processual rather than deterministic. Formal environmental management provides strategic direction, but this direction is unlikely to influence everyday office practices unless it is translated into employee-facing systems through Green HRM, leadership, organizational support, workplace design, communication, and participatory routines. Employee green behaviour is positioned as the enactment mechanism through which environmental intentions become embedded in daily work practices. At the same time, implementation barriers, sectoral conditions, institutional pressures, and the credibility of organizational governance may strengthen or weaken these relationships by shaping whether environmental goals are perceived as feasible, legitimate, and relevant by employees. The originality of the framework lies in articulating this alignment logic for office-based sustainability: it connects governance-level environmental intentions, people-management systems, physical workplace conditions, and employee agency within one synthesis-based explanatory model. In doing so, it moves beyond descriptive lists of green office practices and provides a theoretically informed structure for understanding how office-based organizations may translate environmental commitments into sustained workplace-level action.

The novel insight emerging from the synthesis is integrative rather than additive. The review does not merely identify another antecedent of employee green behaviour or another operational green office practice. Instead, it suggests that office-based sustainability can be understood as a translation process in which formal environmental management is carried into everyday work through employee-facing systems, workplace conditions, and repeated behavioural routines. Within this logic, Green HRM and leadership operate as organizational translation mechanisms; workplace design and indoor environmental quality

act as enabling or constraining conditions; and employee green behaviour represents the enactment pathway through which environmental intentions become embedded in daily office work. This interpretation extends previous knowledge by connecting Green HRM, employee green behaviour, workplace sustainability, and environmental management within one explanatory logic rather than treating them as parallel research areas. It also clarifies why green office practices should be understood not only as operational measures, but as organizational processes linking governance, people-management systems, workplace conditions, and employee agency.

The relationships shown in the framework represent recurrent patterns identified through thematic synthesis and author-team interpretation. They should be read as evidence-informed conceptual links rather than as empirically validated causal pathways.

4.7. Implications for Practice, Policy, and Future Research

The practical implications are straightforward but demanding. Organizations should avoid treating green office practices as short-term campaigns. Recycling bins, paperless policies, energy-saving reminders, and green building certification are useful, but their effects remain limited if they are not connected with employee participation, leadership, HRM systems, and organizational culture. Green HRM can provide that connection by embedding environmental responsibility into recruitment, induction, training, performance discussions, internal communication, and recognition [2,7].

Leaders also need to model sustainable behaviour and explain why green office practices matter. Employees are more likely to engage in green behaviour when they perceive consistency between organizational values and managerial action [15–17]. Workplace design should be aligned with these behavioural and managerial interventions. Indoor environmental quality, green office buildings, plants, ventilation, and spatial design can support employee well-being and environmental awareness, but they cannot replace organizational support.

More concretely, organizations should translate broad green office intentions into named responsibilities, short training routines, feedback on resource use, visible leadership behaviour, and simple procedures that employees can realistically follow during ordinary work. These measures are modest, but they matter because they turn sustainability from a general value into a recognizable part of daily office practice.

The practical implications can be differentiated by stakeholder group. For managers, the priority is to make green office practices part of ordinary managerial routines rather than treating them as occasional awareness campaigns. This includes assigning clear responsibilities, allocating time and resources, modelling visible sustainable behaviour, integrating environmental expectations into team communication, and reviewing simple operational indicators such as paper use, energy use, waste separation, sustainable procurement, and employee participation. For HR professionals, the key task is to operationalize Green HRM through induction, training, internal communication, job-related expectations, participation opportunities, performance conversations, and recognition of employee contributions. For sustainability practitioners and facility managers, the main implication is to connect environmental objectives with practical workplace conditions, including accessible recycling infrastructure, default paperless procedures, energy-saving settings, indoor environmental quality, employee feedback, and routine resource-use monitoring. For policymakers and sectoral bodies, the findings suggest the need for office-level environmental guidance, minimum reporting indicators, sustainable public procurement standards, and policy instruments that address employee participation and organizational governance rather than only technical building performance.

In operational terms, the drivers identified in this review can be translated into a simple implementation logic: awareness should be supported through induction, short recurring training, and targeted communication; participation should be enabled through green teams, employee feedback channels, and suggestion mechanisms; leadership support should be demonstrated through visible managerial modelling and regular follow-up; organizational support should be made concrete through time allocation, budgets, infrastructure, and named responsibilities; and environmental management should be embedded through measurable indicators, monitoring routines, corrective actions, and periodic review. This operationalization is important because the review suggests that green office practices are more likely to become sustained workplace routines when environmental objectives, human-resource practices, physical workplace conditions, and employee agency are aligned.

The reviewed evidence suggests that the most effective organizational practices are not single isolated interventions, but mutually reinforcing bundles of practices that connect behavioural activation, managerial accountability, practical enablement, and performance feedback. First, integrating environmental expectations into Green HRM routines appears particularly important because it links sustainability with employees' ability, motivation, and opportunity to act. This includes induction, short recurring training, internal communication, participation opportunities, performance conversations, and recognition of employee contributions. Second, visible leadership and clearly assigned responsibility are central because they give green office practices legitimacy, continuity, and organizational follow-up. Without managerial modelling and named accountability, green office measures may remain symbolic or dependent on individual enthusiasm. Third, convenient workplace infrastructure and clear procedures are necessary because employees are more likely to engage in sustainable behaviour when recycling, paper reduction, energy saving, sustainable procurement, and resource-efficient routines are easy to perform within ordinary work processes. Fourth, monitoring and feedback on resource use are important because they connect behavioural and organizational change with observable environmental indicators, such as paper consumption, printing volume, electricity use, waste separation, procurement patterns, and participation in green initiatives. These practices are therefore more likely to support sustainability goals when they are implemented together: Green HRM activates and supports employee behaviour, leadership and governance provide legitimacy and continuity, workplace infrastructure reduces practical barriers, and monitoring enables organizations to assess whether green office routines are accompanied by measurable environmental improvements. By contrast, isolated awareness campaigns, stand-alone recycling measures, or physical workplace improvements without HRM, leadership, employee participation, and feedback mechanisms are less likely to produce sustained sustainability-related outcomes.

For office-based organizations, these implications can be translated into a practical implementation sequence. First, organizations should assign clear responsibility for green office coordination, for example through a sustainability officer, Green HRM lead, facility manager, or cross-functional green office team. Second, they should establish a small set of measurable baseline indicators, such as paper consumption, printing volume, electricity use, waste-separation rates, sustainable procurement share, employee participation in green initiatives, and completion of environmental training. Third, green office practices should be embedded into ordinary HRM and management routines, including induction, training, internal communication, performance discussions, team meetings, and recognition systems. Fourth, organizations should provide visible and convenient workplace infrastructure, such as accessible recycling points, default

double-sided or paperless procedures, energy-saving settings, sustainable procurement rules, and feedback on resource use. Finally, implementation should be reviewed periodically through simple audits, employee feedback, and comparison of resource-use indicators over time. These examples do not represent universal prescriptions, but they show how broad sustainability goals can be converted into observable and manageable office-level interventions.

For example, a public administration office could begin by measuring monthly paper use, introducing default double-sided printing, placing clearly labelled waste-separation points near shared work areas, and reporting quarterly changes in printing volume and waste separation to employees. A higher-education or administrative service organization could integrate green office expectations into staff induction, internal communication, procurement procedures, and team-level sustainability goals. Corporate offices could link green office practices with facility-management dashboards, sustainable purchasing criteria, employee mobility policies, and ESG reporting indicators. In all cases, practical examples should be adapted to organizational size, sector, available infrastructure, and employee work patterns rather than implemented as generic one-size-fits-all measures.

Green office practices can also be linked to broader ESG and Sustainable Development Goal (SDG) agendas. At the organizational level, they are most directly connected with the environmental dimension of ESG through resource efficiency, waste reduction, energy use, sustainable procurement, and environmental performance monitoring. They may also contribute to the social dimension when they improve employee participation, well-being, environmental awareness, and workplace quality. In relation to the SDGs, green office practices are particularly relevant to responsible consumption and production, climate action, decent work and economic growth, and sustainable cities and communities. However, these links should not be treated as automatic. To be credible, ESG and SDG alignment requires measurable indicators, clear responsibilities, transparent reporting, and integration into organizational governance rather than symbolic sustainability communication. Future research should therefore examine how office-level environmental practices are incorporated into ESG reporting systems and how they contribute to measurable SDG-related organizational outcomes.

The governance implications of green office practices should also be made explicit. Green office implementation requires more than voluntary employee action or isolated environmental campaigns; it needs clear organizational responsibility, decision-making authority, monitoring routines, reporting procedures, and accountability mechanisms. At the governance level, organizations should define who is responsible for setting green office objectives, collecting and reviewing resource-use indicators, coordinating Green HRM and facility-management actions, communicating progress to employees, and linking office-level practices with broader environmental management or ESG reporting. Governance arrangements are also needed to prevent green office initiatives from becoming symbolic or fragmented. In this sense, green office governance should connect strategic sustainability commitments with operational routines, employee participation, and measurable environmental performance.

At the organizational policy level, green office practices should be translated into internal rules, procedures, and management standards rather than left to informal employee initiative. Organizations can incorporate green office expectations into procurement policies, travel and mobility policies, printing and digital-document procedures, waste-management rules, facility-use guidelines, induction programmes, training plans, and internal sustainability reporting. Policy implications also include defining minimum office-level environmental standards, assigning responsibility for monitoring

compliance, and linking green office objectives with existing environmental management systems, ESG reporting, occupational well-being policies, and HRM procedures. Such policy integration can reduce fragmentation by making green office practices part of ordinary organizational governance, rather than treating them as temporary campaigns or voluntary behavioural recommendations.

Future research should give more direct attention to office-based organizations rather than treating them as incidental workplace settings. Public administration, higher education, healthcare administration, service organizations, and corporate offices may all produce different implementation patterns. Longitudinal and comparative studies are needed to assess whether Green HRM and employee green behaviour may support sustained sustainability-related outcomes over time and how organizational context shapes green office implementation. Further work should also examine paperless and digital work, energy use, employee behaviour, leadership, and workplace design together, and should develop more precise measures of green office maturity that can be compared across organizational settings.

Digital, hybrid, and remote work arrangements also require further attention in green office research. As office work becomes increasingly mediated by digital platforms, videoconferencing, cloud-based collaboration, and home-based workstations, some environmental impacts may shift from the physical office to digital infrastructure and employees' homes. Paperless workflows, reduced commuting, and shared digital documents may support environmental objectives, but they may also be accompanied by increased electricity use, data storage, device use, and blurred responsibility for resource consumption outside the organizational premises. The reviewed evidence provides only limited direct insight into these emerging digital and hybrid workplace conditions. Future research should therefore examine how green office practices operate in hybrid and remote work settings, how organizations can govern digital sustainability, and how environmental performance should be measured when work is distributed across offices, homes, and digital systems.

Collectively, these gaps indicate the need for a more differentiated future research agenda. First, longitudinal and panel studies should examine whether green office practices, Green HRM, leadership, and employee participation produce sustained behavioural change and measurable environmental improvements over time. Second, field experiments and quasi-experimental intervention studies should test the effects of specific organizational measures, such as paperless defaults, real-time feedback on electricity or printing, green teams, environmental training, leadership communication, and changes in workplace infrastructure. Third, comparative cross-country and cross-sector research is needed to examine how institutional regulation, cultural expectations, public-private differences, organizational size, sectoral characteristics, and ownership structures shape green office implementation. Fourth, future studies should combine employee-reported outcomes with objective environmental performance indicators, including energy use, paper consumption, printing volume, waste generation, waste-separation rates, procurement data, emissions, digital resource use, and other measurable sustainability indicators. Fifth, hybrid and remote work should be examined as distinct sustainability contexts rather than as extensions of the conventional office. Such research should analyse how environmental responsibility, resource consumption, employee behaviour, digital infrastructure, commuting reductions, home-office energy use, and organizational monitoring are redistributed across offices, homes, and digital platforms.

AI-enabled workplace sustainability also represents an emerging area for future green office research. Artificial intelligence may support office sustainability through smart energy management, occupancy-based building control, automated monitoring of resource use, predictive maintenance, procurement analytics, employee feedback systems, and ESG-related reporting. However, AI-enabled sustainability tools also raise important governance concerns, including data privacy, employee surveillance, algorithmic transparency, trust, digital energy consumption, and the risk that environmental monitoring becomes disconnected from employee participation. The reviewed evidence provides only limited direct insight into AI-enabled green office practices. Future research should therefore examine how AI-based systems can support measurable environmental performance while remaining transparent, human-centred, and aligned with organizational sustainability governance.

In practical terms, organizations should treat green office implementation as a management process, not as an environmental checklist. The most credible initiatives are likely to be those that make sustainability visible in ordinary routines, supported by leaders, embedded in HRM, enabled by workplace design, and monitored through simple but meaningful indicators.

4.8. Limitations and Overall Interpretation

An important observation emerging from the reviewed literature concerns the methodological profile of the available evidence. Most studies used quantitative survey-based approaches, cross-sectional designs, and self-reported measures. These designs are useful for identifying associations between Green HRM, leadership, organizational culture, employee green behaviour, and sustainability-related outcomes, but they are less able to demonstrate causality, temporal development, or objective environmental improvement. This limits the strength of conclusions that can be drawn about the long-term effectiveness of green office practices.

A second observation concerns the balance between behavioural and environmental management perspectives in the reviewed literature. Environmental management provides the broader framework within which green office practices acquire organizational meaning, but many included studies examined employee behaviour, motivation, or perceptions more extensively than formal environmental management systems, monitoring processes, or objective environmental performance indicators. This creates an imbalance in the evidence: the behavioural side of green office sustainability is more developed than the organizational measurement of environmental outcomes.

In addition to these observations, the review has several limitations. The included studies differ in research design, geographical context, sample characteristics, and conceptual focus, which limits direct comparability. The review was limited to peer-reviewed articles published in English from 2010 onwards, and relevant studies in other languages or forms of grey literature may have been missed. The inclusion of broader organizational workplace settings, in addition to explicitly office-based studies, was necessary because the green office literature remains fragmented, but this also means that some findings are transferred from related workplace contexts rather than derived exclusively from office-specific research.

Given the methodological heterogeneity of the included studies, the synthesis was also interpreted with sensitivity to study design. Findings derived mainly from cross-sectional survey studies were treated as evidence of association rather than causality. Findings from field experiments, green building studies, or workplace-based observational designs were considered useful for understanding workplace conditions and employee experience, but they were not directly comparable with survey-based Green HRM and behavioural studies.

Similarly, studies using different samples, sectors, measurement instruments, and outcome indicators were not treated as producing equivalent levels of evidence. The interpretation of the thematic patterns therefore considered whether a finding was supported across several methodological traditions or mainly concentrated within one type of design. This interpretive sensitivity helped avoid treating heterogeneous empirical evidence as if it were methodologically uniform.

The geographical distribution of the included studies also limits the generalizability of the findings. Several studies were conducted in Asian organizational settings, while evidence from North American, African, Latin American, and some European office-based contexts remains comparatively limited. This distinction matters because green office practices are shaped by institutional, cultural, economic, and regulatory environments. Public-sector organizations may emphasize compliance, formal procedures, and administrative participation, whereas private-sector and service-oriented organizations may give greater attention to efficiency, reputation, employee engagement, or market-related sustainability pressures. National environmental regulation, organizational size, ownership structure, sectoral norms, and workforce characteristics may also influence how green office practices are implemented and how employees respond to them. For this reason, the findings should not be generalized as universal effects of green office practices. They should be interpreted as context-sensitive patterns that require further testing through comparative cross-country, cross-sector, and public–private organizational research.

Geographical context should also be considered as a possible moderator of the relationships examined in this review. The strength and direction of relationships between Green HRM, leadership, organizational support, workplace design, employee green behaviour, and sustainability-related outcomes may vary across institutional and regional settings. Differences in environmental regulation, maturity of sustainability governance, public-sector and managerial traditions, stakeholder pressure, resource-use infrastructure, energy costs, building standards, and cultural expectations regarding employee participation may influence how green office practices are implemented and how employees respond to them. For example, Green HRM and leadership may have stronger behavioural effects in contexts where environmental responsibilities are formally embedded in governance structures and HRM procedures, whereas organizational support may be particularly important in settings where green workplace routines are still emerging or weakly institutionalized. Similarly, the influence of workplace design and indoor environmental quality may depend on climate conditions, building standards, available infrastructure, and regulatory requirements. Because the included studies did not provide sufficiently comparable cross-country evidence, these geographical and institutional differences could not be tested formally as moderators. They should therefore be interpreted as contextual conditions that may shape the transferability of the findings and as an important direction for future comparative research.

Several potential sources of bias should also be considered. Because the review was restricted to peer-reviewed original empirical articles published in English, relevant evidence reported in other languages, grey literature, policy reports, organizational evaluations, or non-indexed practice-based evidence may not have been captured. This decision strengthened academic traceability and comparability, but it may have increased the risk of language bias and publication bias. In addition, positive findings may be overrepresented in the available empirical literature, because studies reporting successful green office implementation, positive employee responses, or beneficial sustainability-related outcomes may be more likely to be published than studies reporting weak, mixed, or unsuccessful results. The predominance of cross-sectional and self-reported designs also means that common

method bias, social desirability bias, and limited causal inference remain important concerns. Because the review did not include a meta-analysis, publication bias could not be examined statistically through funnel plots or related quantitative procedures. These limitations were therefore addressed interpretively by using cautious language, distinguishing associations from causal claims, and identifying the need for future longitudinal, mixed-method, comparative, and practice-based studies.

These limitations point to a more specific methodological agenda for future research. Longitudinal and panel studies are needed to examine whether green office practices and Green HRM lead to sustained behavioural and environmental outcomes over time. Field experiments and quasi-experimental intervention studies could test the effects of concrete measures such as paperless defaults, feedback on resource use, green teams, leadership communication, environmental training, or changes in indoor environmental quality. Comparative cross-country and cross-sector studies are needed to examine how institutional regulation, public–private differences, organizational size, and sectoral norms shape implementation. Mixed-method studies should combine employee surveys with interviews, observations, document analysis, and objective indicators such as energy use, paper consumption, waste-separation rates, procurement data, or environmental performance metrics. Future reviews could also broaden the evidence base by including multilingual searches, grey literature, policy documents, organizational reports, and practice-based evaluations where methodological transparency is sufficient.

Within these limits, the review clarifies how green office practices are connected with employee behaviour, HRM, leadership, workplace characteristics, environmental management, and organizational sustainability. Its interpretation is deliberately cautious. Green office practices represent a relevant but still insufficiently consolidated field of organizational sustainability research. Their value lies not only in reducing workplace-level environmental impacts, but also in showing how sustainability enters the everyday functioning of organizations.

These limitations also shape the interpretation of the review. Green office practices are not presented here as a settled or fully standardized field, but as an emerging area in which concepts, measures, methods, and contexts still require careful alignment. The cautious contribution of this review is to clarify the contours of that field and to indicate where future empirical work can be more precise.

5. Conclusions

Green office practices matter because they show whether environmental responsibility has moved beyond policy statements into everyday work. This review shows that their effectiveness depends less on any single measure than on the way workplace conditions, employee green behaviour, Green HRM, leadership, organizational culture, and environmental commitment are aligned.

The review also clarifies why this field should not be divided too sharply into separate discussions of green buildings, employee behaviour, HRM, or environmental management. In office-based organizations, these elements converge in ordinary routines: how people print, save energy, use digital tools, manage waste, respond to managerial signals, and understand their own role in sustainability. The integrative conceptual framework developed in this article makes this connection visible.

Collectively, the established evidence from the included studies supports three cautious conclusions: Green HRM, leadership, and organizational support are repeatedly associated with employee green behaviour; physical workplace conditions and indoor environmental quality shape employee experience, comfort, and perceived productivity; and formal environmental management requires translation into workplace-level routines

if it is to influence everyday office practices. The conceptual interpretation offered by this review goes one step further. It proposes that these evidence strands should be read as parts of an office-based sustainability system in which governance-level environmental intentions, people-management practices, workplace conditions, and employee agency need to be aligned. This is the study's distinctive contribution to environmental management and organizational sustainability research: it shows how office-based sustainability can be understood not merely as a set of individual practices, behavioural outcomes, or building-related features, but as a relational process connecting environmental management with everyday organizational work.

At the same time, the review indicates that the existing evidence base remains methodologically limited. The most important limitation of the current literature is the lack of longitudinal studies and objective measures of organizational environmental performance. Most available studies explain associations between Green HRM, leadership, organizational support, employee green behaviour, and sustainability-related outcomes, but they provide less direct evidence on whether these practices lead to sustained behavioural change or measurable environmental improvements over time. Future research therefore needs to move beyond cross-sectional and self-reported evidence by using longitudinal, experimental, quasi-experimental, and mixed-method designs, combined with objective indicators such as energy use, paper consumption, waste generation, procurement data, emissions, and other environmental performance metrics. This limitation is central because employee green behaviour and sustainability-oriented organizational culture cannot automatically be equated with verified environmental performance.

The central implication is practical and managerial. A green office is not created by infrastructure alone, nor by asking employees to behave responsibly without support. It is sustained when organizations make green behaviour understandable, credible, convenient, and culturally accepted. The findings also indicate that future research should place greater emphasis on objective environmental performance indicators, environmental management systems, and governance mechanisms. This would complement the predominantly behavioural focus of the existing literature and provide a more balanced understanding of green office sustainability. Future research should therefore examine how these conditions develop over time and how different public, private, educational, service-oriented, and administrative settings shape the durability of green office practices.

Supplementary Materials: The following supporting information can be downloaded at: <https://www.mdpi.com/article/10.3390/su18147235/s1>. File S1: PRISMA 2020 Checklist. File S2: Detailed Search, Screening and Eligibility Assessment Log with Completed PRISMA 2020 Flow Diagram. File S3: Study-Level Quality Appraisal Summary. The PRISMA 2020 checklist, search strategy and screening log, full-text eligibility log, extended quality appraisal table, data extraction table, and PRISMA flow diagram are available online (<https://doi.org/10.5281/zenodo.21038081>).

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Appendix A

Appendix A.1

Table A1. Selected databases and search strategy.

Database	Search Formula
Web of Science Core Collection	TS=(“green office” OR “green office practices” OR “green workplace” OR “sustainable office” OR “sustainable workplace” OR “office sustainability”) AND (“environmental management” OR “environmental sustainability” OR “organizational sustainability” OR “corporate sustainability” OR “sustainable management”) AND (“employee pro-environmental behaviour” OR “employee pro-environmental behavior” OR “green behaviour” OR “green behavior” OR “employee green behaviour” OR “employee green behavior” OR “green HRM” OR “green human resource management”)
Scopus	TITLE-ABS-KEY(“green office” OR “green office practices” OR “green workplace” OR “sustainable office” OR “sustainable workplace” OR “office sustainability”) AND (“environmental management” OR “environmental sustainability” OR “organizational sustainability” OR “corporate sustainability” OR “sustainable management”) AND (“employee pro-environmental behaviour” OR “employee pro-environmental behavior” OR “green behaviour” OR “green behavior” OR “employee green behaviour” OR “employee green behavior” OR “green HRM” OR “green human resource management”)
ScienceDirect	Title, abstract, or keywords: (“green office” OR “green office practices” OR “green workplace” OR “sustainable office” OR “sustainable workplace” OR “office sustainability”) AND (“environmental management” OR “environmental sustainability” OR “organizational sustainability” OR “corporate sustainability” OR “sustainable management”) AND (“employee green behavior” OR “employee green behaviour” OR “pro-environmental behavior” OR “pro-environmental behaviour” OR “green HRM” OR “green human resource management”)
Emerald Insight	All fields/advanced search: (“green office” OR “green office practices” OR “green workplace” OR “sustainable workplace” OR “green human resource management” OR “green HRM”) AND (“employee green behaviour” OR “employee green behavior” OR “pro-environmental behaviour” OR “pro-environmental behavior” OR “organizational sustainability” OR “environmental management”)

Table A1. *Cont.*

Database	Search Formula
PubMed	("green workplace" OR "sustainable workplace" OR "office environment" OR "indoor environmental quality" OR "workplace sustainability") AND ("employee behavior" OR "employee behaviour" OR "pro-environmental behavior" OR "pro-environmental behaviour" OR "well-being" OR "workplace health") AND ("environmental sustainability" OR "organizational sustainability" OR "environmental management")
Google Scholar	("green office" OR "green workplace" OR "sustainable office" OR "sustainable workplace") AND ("environmental management" OR "organizational sustainability" OR "green HRM" OR "employee green behavior" OR "employee pro-environmental behavior")

Note: The search was limited to peer-reviewed original research articles published in English from 2010 onwards. Only full-text articles were considered. Search formulas were adapted to the technical requirements of each database while maintaining conceptual consistency across searches. The final search and record verification were conducted on 31 May 2026. The asterisk (*) was not used in the final search formulas because the relevant term variants were explicitly enumerated.

Appendix A.2

Table A2. Inclusion and exclusion criteria.

Inclusion Criteria	Exclusion Criteria
Studies specifically addressing environmental management in organizations.	Studies outside the field of environmental management, sustainability, organizational practices, or workplace sustainability.
Studies addressing green office practices, green workplace practices, sustainable office environments, or sustainable workplace practices.	Studies focusing exclusively on architecture, construction, building technology, urban planning, or energy efficiency without a clear organizational, managerial, workplace, or employee-related dimension.
Studies examining employee green behaviour, employee pro-environmental behaviour, workplace green behaviour, or environmental awareness among employees.	Studies focusing only on consumers, households, students, or the general public without an organizational or workplace context.
Studies addressing green human resource management, green leadership, organizational culture, employee engagement, or organizational support in relation to environmental sustainability.	Studies addressing human resource management, leadership, organizational culture, or employee engagement without a clear environmental or sustainability-related dimension.
Studies addressing organizational sustainability, corporate sustainability, environmental performance, or sustainable management in organizational settings.	Studies addressing sustainability only at the macroeconomic, national, urban, or policy level without relevance to organizational or employee-level practices.
Original peer-reviewed research articles.	Review articles, systematic reviews, scoping reviews, meta-analyses, editorials, commentaries, opinion papers, book chapters, books, reports, theses, and dissertations.
Quantitative, qualitative, or mixed-method empirical studies with a clearly defined aim, methodology, sample or data source, and reported findings.	Purely theoretical, conceptual, or argumentative papers without empirical data.
Full-text articles available through open access, publisher websites, institutional repositories, or other publicly accessible academic sources.	Articles without accessible full text.
Full text published in English.	Full text published in languages other than English.

Table A2. Cont.

Inclusion Criteria	Exclusion Criteria
Studies published from 2010 onwards.	Studies published before 2010.
Studies not explicitly using the term “green office” but providing relevant evidence on green workplace practices, employee environmental behaviour, green human resource management, or organizational sustainability.	Duplicate records; where duplicate versions existed, only the most complete version was retained.

Note: The same criteria were applied during title and abstract screening and full-text eligibility assessment.

Appendix A.3

Table A3. Overview of included study characteristics.

Study	Region	Year	Method	Sample/Data Source	Key Variables/Research Focus	Key Findings
Nieuwenhuis et al. [42]	United Kingdom/ Netherlands	2014	Three field experiments	Office workers in real workplace settings	Green versus lean office space; plants; workplace productivity; satisfaction	Green office space was associated with higher workplace satisfaction, perceived air quality, and productivity compared with lean office settings.
Blok et al. [43]	Netherlands	2015	Survey research	University employees	Workplace sustainability; pro-environmental behaviour; organizational context	Employee pro-environmental behaviour was shaped by both individual motivation and organizational or workplace conditions.
Pasharibu et al. [44]	Indonesia	2019	Quantitative survey	Employees in regency/city government offices	Green office dimensions; public offices; organizational implementation	The study identified relevant dimensions of green office implementation and emphasized the importance of organizational support in public offices.
Fawehinmi et al. [45]	Malaysia	2020	Quantitative survey/SEM	Employees in Malaysian organizations	Green HRM; employee green behaviour; personal moral norms	Green HRM and personal moral norms were associated with employee green behaviour in organizational settings.
Saifulina et al. [46]	Spain	2020	Empirical quantitative study	Employees in organizational settings	Sustainable HRM; Green HRM; pro-environmental behaviour at work	Green HRM was found to influence workplace pro-environmental behaviour, supporting the role of HRM in environmental sustainability.
Xiao et al. [47]	China	2020	Cross-level quantitative model	Employees and organizational units	Employee-organization fit; voluntary green behaviour; green organizational climate	Green organizational climate strengthened the relationship between employee-organization fit and voluntary green behaviour.
Parida et al. [48]	India	2021	Empirical quantitative study	Green office building context	Green office buildings; Green HRM; employee outcomes; sustainability	Green office buildings and Green HRM were linked to employee-related outcomes and broader organizational sustainability.
Zhu et al. [49]	China	2021	Quantitative survey/SEM	Employees in Chinese organizations	Green HRM; employee green behaviour; environmental belief; green organizational identity	Green HRM positively influenced employee green behaviour through environmental belief and green organizational identity.
Mansoor et al. [50]	Pakistan	2021	Quantitative empirical study	Employees in organizations	Green transformational leadership; management initiatives; green creativity	Leadership and management initiatives stimulated green creativity and supported environmental performance in organizations.
Ribeiro et al. [51]	Portugal	2022	Quantitative survey/mediation analysis	Employees in organizational settings	Green HRM; eco-friendly behaviour; organizational identification	Green HRM promoted eco-friendly behaviour, with organizational identification acting as an important mediating mechanism.
Omarova and Jo [52]	Kazakhstan	2022	Cross-sectional online survey/SEM	Employees from private and public organizations	Environmental transformational leadership; Green HRM; employee pro-environmental behaviour	Environmental transformational leadership affected employee pro-environmental behaviour, while Green HRM acted as a relevant organizational mechanism.

Table A3. *Cont.*

Study	Region	Year	Method	Sample/Data Source	Key Variables/Research Focus	Key Findings
Chen and Wu [53]	China	2022	Quantitative survey/SEM	Employees in organizations	Green HRM; green transformational leadership; employee green behaviour	Green HRM and green transformational leadership jointly facilitated employee green behaviour.
Khan et al. [54]	Pakistan	2022	Quantitative empirical study	Hospitality employees	Antecedents of employee green behaviour; organizational support; environmental values	Organizational and individual antecedents were identified as relevant predictors of employee green behaviour.
Mohd Razali et al. [55]	Malaysia	2022	Survey study	Employees in government organizations	Green office concept; employee awareness; government organizations	Employee awareness and acceptance were shown to be important for the implementation of the green office concept in government organizations.
Li et al. [56]	China	2023	Quantitative survey/moderation model	Employees after the COVID-19 pandemic	Green HRM; in-role green behaviour; spiritual leadership	Green HRM was linked to in-role green behaviour, with leadership strengthening the relationship.
Ahmad et al. [57]	Pakistan	2023	Quantitative empirical modelling	Employees in organizations	Workplace pro-environmental behaviour; Green HRM; organizational support	Green HRM and organizational support contributed to workplace pro-environmental behaviour.
Tandon et al. [58]	United Kingdom	2023	Empirical quantitative study	Tourism-sector employees/organizations	Green HRM; green and non-green outcomes	Green HRM influenced environmental and broader organizational outcomes.
Rasheed and Rotimi [59]	New Zealand	2024	Empirical perception study	Workers in green office environments	Green office environment; indoor environmental quality; worker perception	Indoor environmental quality emerged as an important component of worker perception in green office environments.
Alherimi et al. [60]	United Arab Emirates	2024	Case study/quantitative empirical research	Employees in an organization	Employee pro-environmental behaviour; organizational context	The organizational context was relevant for understanding employee pro-environmental behaviour.
Carbone et al. [61]	Italy	2024	Empirical quantitative study	Employees in workplace settings	Green workplace behaviours; employee contribution; organizational antecedents	Employees contributed to green workplace behaviours when organizational conditions supported such practices.
Srikolchan et al. [62]	Thailand	2026	Quantitative survey	Faculty members, operational staff, and students	Participation and engagement in Green Office operation	Training, communication, collaboration, and recognition influenced participation and engagement in Green Office operation.
Bangwal et al. [63]	India	2025	Quantitative empirical study	Employees in organizational settings	Green HRM; employee pro-environmental behaviour; environmental commitment	Green HRM and environmental commitment were associated with employee pro-environmental behaviour.

Note: The appendix summarizes the empirical studies included in the qualitative thematic synthesis.

Appendix A.4

Table A4. Thematic categories and coding framework derived from the analysis of included studies.

No.	Thematic Category	Coding Focus	Codes and Subcodes Identified in the Analysis	Analytical Meaning for the Synthesis
1	Green office practices and workplace sustainability	Organizational and operational practices that make office work more environmentally sustainable.	Green office implementation; paper reduction and digitalization; energy saving; waste reduction and recycling; sustainable procurement; green workplace routines; sustainable office/building environment; indoor environmental quality and workplace comfort ($n = 8$).	This category captures concrete office-level practices through which organizations translate environmental management into everyday workplace procedures and routines.
2	Employee environmental behaviour	Behavioural responses of employees to environmental initiatives in the workplace.	Employee green behaviour; employee pro-environmental behaviour; in-role green behaviour; extra-role or voluntary green behaviour; environmental awareness; participation in green activities; behavioural intention; personal norms; environmental responsibility ($n = 9$).	This category explains how individual employees contribute to, support, or limit the implementation of green office and workplace sustainability practices.

Table A4. Cont.

No.	Thematic Category	Coding Focus	Codes and Subcodes Identified in the Analysis	Analytical Meaning for the Synthesis
3	Green human resource management	HRM mechanisms used to support environmental goals and employee green behaviour.	Green recruitment and selection; green training and development; green performance management; green rewards; employee engagement; environmental competencies; organizational support; internal communication; participation-oriented HRM practices ($n = 9$).	This category links environmental management with people-management practices and shows how HRM systems can institutionalize employee-oriented sustainability.
4	Green leadership and organizational support	Leadership, managerial support, and organizational climate enabling workplace sustainability.	Green transformational leadership; environmental leadership; supervisor support; green organizational climate; green organizational identity; environmental commitment; trust; recognition; role modelling; communication of environmental expectations ($n = 10$).	This category identifies the relational and cultural conditions that strengthen employees' willingness to engage in green behaviour and sustain green workplace initiatives.
5	Environmental management and governance	Formal organizational systems, policies, and managerial processes related to environmental performance.	Environmental management systems; corporate environmental policy; environmental compliance; environmental information disclosure; environmental performance; green innovation; resource efficiency; monitoring; accountability; strategic environmental management ($n = 10$).	This category situates green office practices within wider organizational governance and environmental management structures rather than treating them as isolated activities.
6	Organizational sustainability outcomes	Outcomes associated with environmental, social, and organizational performance.	Organizational sustainability; environmental performance; corporate sustainability; employee well-being; productivity; organizational reputation; green creativity; sustainability culture; competitive advantage; contribution to SDGs ($n = 10$).	This category shows how green office and workplace practices are connected to broader sustainability outcomes at organizational and societal levels.
7	Implementation barriers and contextual conditions	Factors that facilitate or hinder the adoption of green office practices and employee environmental behaviour.	Limited resources; weak institutional support; lack of training; low employee awareness; inconsistent implementation; sectoral differences; public/private sector context; measurement inconsistency; fragmented evidence; availability of full methodological information ($n = 10$).	This category supports a critical interpretation of the literature by identifying why green office practices may not produce uniform outcomes across organizations or countries.

Note: n indicates the number of included studies contributing evidence to the thematic category; it does not represent the number of individual codes or statistical effect sizes.

Appendix A.5

Table A5. Thematic evidence matrix linking thematic categories, study support and interpretive caution.

Thematic Category	Main Supporting Studies	Dominant Type of Evidence	Main Interpretation	Main Limitations/Caution
Green office practices and workplace sustainability	Nieuwenhuis et al. [42]; Pasharibu et al. [44]; Parida et al. [48]; Mohd Razali et al. [55]; Rasheed and Rotimi [59]; Srikolchan et al. [62]	Field/experimental, public-sector office, green building, indoor environmental quality and participation-oriented evidence	Green office practices appear as workplace-level environmental routines that require organizational support, employee awareness, and practical infrastructure.	Evidence is heterogeneous and context-dependent; direct environmental performance indicators are limited.
Employee environmental behaviour	Blok et al. [43]; Fawehinmi et al. [45]; Xiao et al. [47]; Zhu et al. [49]; Ribeiro et al. [51]; Alherimi et al. [60]; Carbone et al. [61]; Bangwal et al. [63]	Mainly quantitative cross-sectional survey evidence on employee attitudes, motivation, climate, identification, commitment and behaviour	Employee green behaviour functions as a behavioural enactment pathway through which environmental expectations may enter daily work routines.	Most studies rely on self-reported behaviour and cross-sectional designs, limiting causal inference.
Green HRM	Fawehinmi et al. [45]; Saifulina et al. [46]; Parida et al. [48]; Zhu et al. [49]; Ribeiro et al. [51]; Chen and Wu [53]; Li et al. [56]; Ahmad et al. [57]; Tandon et al. [58]; Bangwal et al. [63]	Predominantly survey-based organizational behaviour and HRM evidence	Green HRM appears to support green office implementation by embedding environmental expectations into training, participation, communication, recognition and employee-related routines.	Green HRM effects are often inferred from associations; objective environmental outcomes and longitudinal evidence remain limited.

Table A5. Cont.

Thematic Category	Main Supporting Studies	Dominant Type of Evidence	Main Interpretation	Main Limitations/Caution
Green leadership and organizational support	Xiao et al. [47]; Mansoor et al. [50]; Omarova and Jo [52]; Chen and Wu [53]; Li et al. [56]; Ahmad et al. [57]; Srikolchan et al. [62]	Cross-sectional leadership, organizational support, green climate and participation studies	Leadership and organizational support may make green practices more visible, legitimate and repeatable in everyday office work.	The relative influence of leadership versus HRM, culture or infrastructure is difficult to isolate across heterogeneous designs.
Environmental management and governance	Pasharibu et al. [44]; Parida et al. [48]; Mohd Razali et al. [55]; Tandon et al. [58]; Alherimi et al. [60]; Carbone et al. [61]; Srikolchan et al. [62]	Organizational, policy, participation and implementation-oriented evidence	Environmental management and governance provide formal direction for green office practices through policies, responsibilities, monitoring and sustainability expectations.	Formal governance mechanisms are less directly examined than behavioural and HRM mechanisms.
Organizational sustainability outcomes	Parida et al. [48]; Mansoor et al. [50]; Tandon et al. [58]; Alherimi et al. [60]; Carbone et al. [61]; Bangwal et al. [63]	Survey and organizational outcome evidence, mostly behavioural or perceptual rather than objective environmental measurement	Green office practices may contribute to sustainability-related outcomes when aligned with HRM, leadership, employee participation and governance.	Evidence for objective environmental performance, long-term change and causal pathways remains limited.
Implementation barriers and contextual conditions	Blok et al. [43]; Pasharibu et al. [44]; Mohd Razali et al. [55]; Rasheed and Rotimi [59]; Srikolchan et al. [62]; Bangwal et al. [63]	Public-sector, green office operation, worker perception and employee commitment evidence	Implementation varies with awareness, training, communication, recognition, organizational support, workplace conditions and sectoral context.	Contextual variation limits generalizability; comparative cross-country, cross-sector and public-private research is needed.

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