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Framing Sustainability at Work: A Preliminary Integrative Mapping Review of HR Communication Psychological Mechanisms, and Employee Green Behavior

Shinta Ratnawati¹, Wirawan Dony Dahana², Hanung Eka Atmaja³, Dian Marlina Verawati⁴, Ipuk Widayanti⁵

^{1,3,4,5} Department of Management, Faculty of Economics, Universitas Tidar, Magelang, Indonesia.

Email: shinta_ratna@untidar.ac.id¹, hanung.ekaatmaja@untidar.ac.id³, dianmarlina86@untidar.ac.id⁴, ipuk.widayanti@untidar.ac.id⁵

² Graduate School of Economics, Osaka University, Osaka, Japan. Email: dony@econ.osaka-u.ac.jp²

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ABSTRACT

This preliminary integrative mapping review examines how sustainability communication within human resource management (HRM) is associated with employee psychological mechanisms, pro-environmental work behavior, and employee and organizational outcomes. Two complementary Scopus search streams conducted on 5 August 2026 identified 848 records. After removing two duplicates and one non-English record, 845 titles and abstracts were screened using workplace, sustainability, communication, and employee-outcome criteria. Twenty-five records were retained for abstract-level descriptive mapping, thematic coding, and theory-based integration. Full-text eligibility verification, formal quality appraisal, and independent double coding were not completed; therefore, findings are interpreted as provisional patterns rather than definitive systematic-review evidence. The mapping indicates that sustainability communication functions as an embedded HRM architecture shaped by message clarity, credibility, framing, source, channel, dialogue, and consistency with enacted HR practices. Cognitive, affective, motivational, and social-organizational mechanisms, including role clarity, processing fluency, green self-efficacy, trust, organizational identification, and moral obligation, help explain employee responses to sustainability signals. Green leadership, psychological climate, HRM-system strength, organizational culture, and industry conditions act as boundary conditions, while ambiguity, symbolic messaging, and perceived greenwashing may produce adverse responses. The review proposes a provisional five-stage framework linking sustainability intentions, communication signals, employee interpretation, psychological mechanisms, pro-environmental work behavior, and employee and organizational outcomes. Further full-text verification and formal quality appraisal are required to validate the framework.

Keywords: Sustainability Communication, Human Resource Management, Green Human Resource Management, Pro-Environmental Work Behavior, Employee Psychological Mechanisms.

JEL Code: M12, M14, Q01, Q56

I. Introduction

Sustainability has become a central organizational priority as firms seek to reduce environmental harm without weakening operational effectiveness or long-term competitiveness. Technologies,



environmental systems, and formal policies remain important, but their results depend on employees' everyday decisions concerning energy, materials, waste, mobility, green voice, and innovation. This employee-centered logic underpins Green Human Resource Management (Green HRM), which embeds environmental objectives in recruitment, training, performance management, rewards, involvement, and leadership, and sustainable HRM, which considers the longer-term economic, social, human, and environmental consequences of managing people (Aust et al., 2020; Renwick et al., 2013; Ren et al., 2018). Employees respond not only to formal HR practices but also to the signals those practices convey about what the organization values, expects, and rewards. HRM-system strength suggests that distinct, consistent, and consensual signals promote shared interpretations (Bowen & Ostroff, 2004). In this review, HR sustainability communication refers to organizational messages, interactions, and symbolic practices that explain environmental priorities, clarify employees' roles, motivate action, and enable dialogue. These signals may originate from leaders, HR specialists, line managers, sustainability units, peers, training, internal social media, feedback systems, recognition programs, and daily managerial interaction (Morsing & Schultz, 2006; Welch & Jackson, 2007).

Communication effectiveness depends on how messages are framed and interpreted. Gain frames emphasize benefits of action, whereas loss frames emphasize the costs of inaction; neither is universally superior because effects vary by behavior, perceived risk, psychological distance, mindset, and organizational context (Levin et al., 1998; Rothman & Salovey, 1997; Decrinis et al., 2023; Su & Li, 2024). Processing fluency, perceived relevance, self-efficacy, trust, identification, moral obligation, and psychological green climate can translate communication into in-role and extra-role green behavior. Recent GRHRM studies similarly associate green leadership and organizational support with green self-efficacy, Green HRM with sustainable performance and organizational citizenship behavior for the environment, and ESG-oriented HR practices with employee performance and well-being (Aldisa et al., 2025; Arafah et al., 2025; Rahman & Saba, 2025; Tabita & Gayatri, 2026). Despite this growth, the literature remains fragmented. Green HRM studies commonly assess bundles of practices without explaining how employees interpret them; framing studies often focus on consumers or public campaigns; and internal-communication research does not always connect channels, credibility, and dialogue with specific workplace environmental behaviors. Cumulative knowledge is further constrained by cross-sectional self-report designs, intention-based outcomes, limited multilevel and longitudinal evidence, and inconsistent measurement across sectors and countries. The unresolved scholarly question is therefore not simply whether Green HRM or sustainability communication is associated with favorable employee outcomes, but how organizational sustainability intentions are translated into employee action through communication design and interpretation, and under what conditions that translation succeeds, weakens, or reverses. Apparent contradictions may reflect differences in message design, communication quality, employee characteristics, organizational support, context, and research design rather than theoretical incompatibility.

This review addresses six questions: how sustainability communication is conceptualized and implemented in HRM; which message and framing strategies encourage employee green behavior; which psychological mechanisms connect communication with behavior; which individual and organizational conditions strengthen or weaken effectiveness; which employee and organizational outcomes are associated with communication; and which theoretical and methodological gaps should guide future research. The review contributes by positioning sustainability communication as a strategic HR process connecting intended Green HRM practices with employee interpretation and enacted behavior. Existing Green HRM models largely link bundles of practices with attitudes and behavior, internal communication models emphasize relationships and channels, and framing models explain how message presentation shapes judgment. The proposed framework advances these streams by explicitly separating five linked stages, namely organizational sustainability intentions and Green HRM practices, communication signals and message characteristics, employee interpretation and psychological mechanisms, pro environmental work behavior, and employee or organizational outcomes, while treating leadership, culture, HRM system strength, employee participation, industry, and resource availability as boundary conditions. It also incorporates adverse pathways such as ambiguity, perceived hypocrisy, and greenwashing. The novelty therefore lies in

process integration across organizational signals, message design, employee sensemaking, and behavior rather than in proposing another isolated HRM variable.

II. Literature Review and Hypothesis Development

2.1. Green and Sustainable Human Resource Management

Green HRM treats employees as active contributors to environmental management by using recruitment, development, appraisal, rewards, and participation to build environmental ability, motivation, and opportunity (Renwick et al., 2013; Ren et al., 2018). Sustainable HRM has a broader common-good orientation that evaluates the long-term economic, social, human, and environmental consequences of managing people (Aust et al., 2020). These perspectives are complementary: Green HRM defines the immediate environmental domain, while sustainable HRM supplies the wider normative rationale. Their effects, however, depend on employee perceptions. Distinctive, consistent, and consensual signals across policies, leadership behavior, training, performance standards, and rewards make environmental expectations credible; contradictory signals invite skepticism or symbolic interpretations (Bowen & Ostroff, 2004).

2.2. HR Sustainability Communication

Internal communication is a strategic process for developing relationships, shared meanings, and employee engagement rather than a one-way administrative activity (Welch & Jackson, 2007). Applied to environmental management, HR sustainability communication conveys values, policies, expected behaviors, available resources, and persuasive appeals through leaders, HR professionals, line managers, peers, training, meetings, digital platforms, feedback, recognition, and informal interaction. It performs informational, interpretive, persuasive, and participative functions: employees learn what to do, why it matters, how it relates to their work, and how they can contribute. Dialogue and employee involvement strengthen credibility because implementation can be questioned, adapted, and jointly interpreted (Morsing & Schultz, 2006). Communication therefore links intended HR practices with perceived and enacted practices and should be treated as an HR-system mechanism rather than a stand-alone campaign.

2.3. Message Framing, Psychological Congruence, and Processing Fluency

Message framing presents related information through different reference points. Gain-framed messages emphasize benefits such as efficiency, savings, or environmental contribution; loss-framed messages emphasize waste, damage, or reputational and operational costs (Levin et al., 1998). Framing effects are conditional rather than universal and depend on perceived risk, behavioral function, motivational orientation, and context (Rothman & Salovey, 1997; Su & Li, 2024). Workplace messages also vary in whether they emphasize individual or collective benefits, immediate or future consequences, economic or ecological outcomes, social norms, moral responsibility, and organizational identity. Recent workplace evidence reinforces this contingency: normative and emotional appeals, gain frames, and internal social-media framing can influence employee environmental choices, but their effects vary by audience, channel, and behavioral target (Kang & Kang, 2023; Decrinis et al., 2023; Ng et al., 2025). Message framing should therefore be evaluated together with psychological congruence rather than as an isolated main effect.

Psychological congruence describes the fit between message characteristics and employees' cognitive, affective, or motivational orientations. Congruent messages are generally easier to process and may feel more relevant, credible, and emotionally resonant; this subjective ease is captured by processing fluency (Reber et al., 2004). Construal Level Theory adds that psychologically distant events are represented abstractly, whereas near events are represented concretely (Trope & Liberman, 2010). Sustainability messages may therefore be more effective when their abstraction, temporal focus, and framing fit how employees construe

the problem. Gratitude, regulatory focus, environmental values, moral identity, perceived scarcity, and prior behavior are illustrative orientations that may condition this fit (Septianto et al., 2020).

2.4. Employee Psychological Mechanisms

Sustainability communication is unlikely to affect employee behavior through a single undifferentiated process. Across the literature, mechanisms can be organized into four analytically distinct but potentially sequential families: cognitive mechanisms determine whether employees understand and believe the message; affective mechanisms shape emotional salience; motivational mechanisms determine whether employees value the action and believe they can perform it; and social-organizational mechanisms determine whether the message is trusted, supported, and incorporated into work roles. This synthesis is more informative than treating individual mediators as interchangeable. Social Cognitive Theory is especially relevant because it conceptualizes behavior as the product of reciprocal relationships among personal factors, behavior, and the environment, with self-efficacy playing a central role in goal choice, effort, and persistence (Bandura, 1986). Recent Green HRM and internal-communication evidence similarly points to combinations of self-efficacy, trust, role identity, and psychological climate rather than a single universal mediator (Garavan et al., 2023; Ng et al., 2025; Sun et al., 2025).

a. Cognitive mechanisms

Cognitive mechanisms concern how employees understand, evaluate, and interpret sustainability messages. These mechanisms may include environmental knowledge, processing fluency, perceived relevance, risk perception, credibility, and outcome expectations. Communication can clarify how routine work behavior contributes to organizational environmental outcomes and can reduce ambiguity regarding expected actions. Nevertheless, information alone may be insufficient when employees do not see the behavior as feasible, consequential, or supported by their work environment.

b. Affective mechanisms

Affective mechanisms concern emotions generated by environmental communication, including gratitude, pride, hope, guilt, concern, and anxiety. Emotional responses can direct attention and increase the motivational salience of sustainability issues. However, emotional activation does not automatically lead to durable behavior. Positive appeals may create enthusiasm without sustained commitment, while excessive guilt or threat may generate avoidance, defensiveness, or message fatigue. The review should therefore distinguish the immediate affective response to a message from its longer-term behavioral consequences.

c. Motivational mechanisms

Motivational mechanisms explain whether employees value an environmental action and believe they can perform it. Green self-efficacy can be strengthened through clear guidance, credible encouragement, feedback, and evidence that employee actions matter (Bandura, 1986). Green psychological climate and goal alignment further connect Green HRM with in-role and extra-role behavior (Dumont et al., 2017; Unsworth et al., 2013). Complementary GRHRM evidence indicates that green transformational leadership and perceived organizational support can strengthen green self-efficacy, which then supports environmentally oriented intentions (Aldisa et al., 2025).

d. Social and organizational mechanisms

Employees interpret environmental messages within an employment relationship. Organizational identification, perceived support, managerial trust, green psychological climate, and perceived HRM-system strength therefore shape whether messages are accepted and enacted (Norton et al., 2017). Leadership modeling is especially important: communication becomes credible when leaders' behavior, resource

allocation, and HR systems reinforce the message, and symbolic when organizational conduct contradicts it (Robertson & Barling, 2013).

2.5. Employee Green Behavior and Organizational Outcomes

Employee pro-environmental work behavior includes prescribed and discretionary actions that improve or harm environmental sustainability. Examples include energy and water conservation, material reduction, recycling, food-waste reduction, sustainable commuting, green helping, green voice, and green creativity (Norton et al., 2015). These behaviors vary in visibility, effort, frequency, personal cost, and dependence on infrastructure. In-role behavior is shaped more directly by job requirements and performance systems, whereas extra-role behavior depends more strongly on autonomy, identification, climate, and intrinsic motivation (Dumont et al., 2017). Communication may influence work engagement, satisfaction, commitment, productivity, green creativity, operational efficiency, resource savings, innovation, environmental performance, and broader sustainability outcomes. Recent GRHRM studies connect Green HRM with sustainable business performance through green technology innovation and organizational culture and link ESG-integrated HR practices with employee performance and well-being (Rahman & Saba, 2025; Tabita & Gayatri, 2026). Positive outcomes are not automatic: added environmental demands can create role overload, cynicism, or fatigue when resources and job design are inadequate. Arafah et al. (2025), for example, report that Green HRM may enhance environmental citizenship behavior while also increasing emotional exhaustion. Productivity effects should therefore be examined as contingent on implementation quality, capability, support, and integration with normal work.

2.6. Boundary Conditions

Communication effectiveness varies across individual values and efficacy, message source and framing, job autonomy, team norms, leadership, employee participation, green psychological climate, HRM-system strength, organizational culture, industry, regulation, national context, resource availability, and the cost or visibility of the target behavior (Bowen & Ostroff, 2004; Norton et al., 2017). Explicitly coding these conditions helps explain heterogeneous findings and prevents contextual differences from being misread as theoretical failure.

2.7. Integrative Theoretical Positioning

The theoretical perspectives used in this review operate at different explanatory levels and are therefore complementary rather than competing. HRM-system strength and signaling logic explain what organizational practices communicate and why distinctive, consistent, and consensual signals can produce shared interpretations (Bowen & Ostroff, 2004). Message Framing Theory explains how reference points such as gains, losses, norms, and moral consequences alter the evaluation of an otherwise similar sustainability objective (Levin et al., 1998; Rothman & Salovey, 1997). Social Cognitive Theory explains how interpretation becomes action through self-efficacy, outcome expectations, observational learning, and environmental support (Bandura, 1986). Construal Level Theory narrows the framing account by explaining when message abstraction fits employees' psychological distance from an environmental issue (Trope & Liberman, 2010), while sensemaking and dialogic communication perspectives explain how employees actively reconcile ambiguous or contradictory organizational signals (Morsing & Schultz, 2006). Integrated sequentially, these lenses explain a cross-level process from organizational intent to message design, employee interpretation, psychological mechanisms, behavior, and outcomes. Their distinct explanatory boundaries prevent theoretical redundancy and clarify that the integrative contribution lies in the interfaces among stages, not in claiming that any one theory explains the entire pathway.

III. Research Method

3.1. Preliminary Integrative Mapping Review Design

This study is presented as a preliminary integrative mapping review that uses systematic search and screening procedures to organize a conceptually diverse field and develop an initial theoretically integrated account of sustainability communication in HRM. Integrative reviews are appropriate when a field contains heterogeneous theories, methods, and contexts and when the objective is conceptual synthesis rather than effect size aggregation (Torraco, 2005; Whittemore & Knafl, 2005). The review combined systematic searching, transparent title and abstract screening, descriptive mapping, thematic synthesis, and theory based integration (Snyder, 2019; Tranfield et al., 2003). Identification and screening were reported in a PRISMA 2020 aligned format (Page et al., 2021). Because full text eligibility verification and formal quality appraisal were not completed, the present manuscript does not claim the evidentiary status of a completed systematic review. Its role is transparent abstract level mapping and theory building.

3.2. Data Source and Search Strategy

The evidence base was drawn from two Scopus export files generated on 5 August 2026. Scopus was selected for its multidisciplinary coverage of management, organizational behavior, communication, psychology, and sustainability research. Two complementary search streams were used to reduce terminological bias. The first emphasized Green HRM or sustainable HRM combined with communication, framing, signaling, and employee/workplace terms. The second emphasized sustainability or environmental communication and message framing combined with employee/workplace and pro-environmental behavior terms. Searches were conducted in title, abstract, and keyword fields. Records were limited to journal articles and reviews available in English where database metadata permitted filtering. No initial-year restriction was applied because foundational communication and framing studies predate the emergence of Green HRM as a distinct research stream. The complete Scopus strings are reproduced in Appendix A. Exports included titles, authors, years, sources, abstracts, keywords, DOI, citation counts, affiliations, and database identifiers. The original CSV files and the structured screening and coding matrix form the review audit trail. References used solely for conceptual positioning, including recent GRHRM articles, were not added to corpus counts or evidence tables unless they were captured and retained through the stated search and screening procedure.

3.3. Eligibility Criteria

Articles were retained when they addressed an employment or workplace context; contained an identifiable communication, message-framing, signaling, feedback, knowledge-transfer, or employee-interpretation component; addressed environmental sustainability or Green HRM; and reported employee psychological, behavioral, performance, or organizational environmental outcomes. Consumer-only, household-only, tourist-only, technical, corporate-reporting, or macro-level sustainability studies were excluded when they lacked a meaningful employee communication component. Conference papers, editorials, book reviews, non-English records, and duplicate records were excluded. Relevance was judged from substantive content rather than dependence on the exact phrase "HR sustainability communication."

3.4. Study Selection and Corpus Formation

The first Scopus stream yielded 535 records and the second yielded 313, producing 848 records before deduplication. Two duplicate title records were removed and one non-English record was excluded, leaving 845 English-language records for title-and-abstract screening. Screening applied the workplace, sustainability, communication, and employee-outcome criteria described above. Twenty-five records were

retained as the preliminary abstract-level mapping corpus. Figure 1 summarizes this screening flow. These records were not treated as a finalized systematic-review sample because complete full-text eligibility assessment, formal quality appraisal, and independent double screening had not been completed at the time of analysis. The terminology throughout the manuscript was therefore revised from 'included studies' to 'preliminary retained records' where the distinction matters.

3.5. Data Extraction and Coding

A structured matrix was used to extract bibliographic characteristics, national and industrial context, research design, sample or data source, theoretical foundation, communication construct, message characteristics, psychological mechanisms, moderators, employee behavior, employee outcomes, organizational outcomes, main findings, limitations, and review contribution. Coding followed an antecedent, message, mechanism, behavior, outcome, and context logic. Deductive codes derived from the review questions and provisional framework were combined with inductive codes emerging from the records. The coding matrix is supplied as Supplementary File S1.

3.6. Data Synthesis

The corpus was analyzed through three complementary procedures. Descriptive mapping summarized publication development, geography, sector, research design, theory, communication strategy, mechanisms, and outcomes. Thematic synthesis identified recurring descriptive themes and developed higher-order analytical themes while preserving traceability to the coded studies (Thomas & Harden, 2008). Theory-based integration compared the explanatory roles of HRM signaling, message framing, social cognitive theory, construal-level theory, social exchange, and related perspectives. Contradictory findings were interpreted in relation to message type, communication quality, behavior, context, method, and measurement rather than treated as directly equivalent evidence.

3.7. Quality-Appraisal Status and Coding Reliability

The planned quality-appraisal framework for a completed review is the Mixed Methods Appraisal Tool (MMAT) for empirical studies, supplemented by conceptually appropriate review criteria for nonempirical articles (Hong et al., 2018; Snyder, 2019). Formal criterion-level appraisal was not completed because the current corpus was coded from Scopus metadata and abstracts. Screening and coding used a structured decision log and repeated consistency checks, but independent double screening was not performed and no inter-rater reliability statistic was calculated. Consequently, no study-level quality weights are used and no claims are presented as quality-adjusted effects. To preserve research integrity, procedures that were not conducted are not retrospectively reported as completed. A definitive review should retrieve and verify the full texts of the 25 retained records, document full-text exclusions, conduct independent appraisal or consensus coding, and report agreement and sensitivity checks before treating the evidence base as final.

3.8. Reporting and Research Integrity

The review reports the search date, search streams, record counts, eligibility principles, screening status, coding architecture, and limitations of the evidence base. Figure 1 is labeled as a preliminary PRISMA aligned screening flow so that title and abstract mapping is not confused with completed full text eligibility or quality appraisal. Because the study analyzes published literature and does not involve human participants or personal data, ethics approval and participant consent were not required. Source findings were separated from reviewer interpretation, and article counts and classifications were derived from the supplied Scopus

exports and coding matrix. All results are therefore reported as descriptive or theory building patterns rather than causal or quality weighted conclusions.

IV. Result and Discussion

This section presents descriptive mapping, thematic synthesis, theoretical integration, the future research agenda, and implications derived from the two Scopus search streams. The first yielded 535 records and the second 313, producing 848 records before deduplication. After removing two duplicates and one non English record, 845 English language titles and abstracts were screened, and 25 records formed the preliminary abstract level mapping corpus. The evidence status rule applied throughout this section is explicit. Counts and coded patterns may be reported descriptively, but interpretive statements are framed as provisional because full text verification, formal quality appraisal, and independent double coding remain outside the present analysis.

4.1. Search and Screening Outcomes

The broad interdisciplinary search captured Green HRM, corporate environmental communication, message framing, employee engagement, green climate, and pro-environmental behavior. Records were excluded when they focused exclusively on consumers, tourists, households, technical systems, corporate reporting, or sustainability practices without an identifiable employee communication, interpretation, or signaling component.

Table 1. Search and Screening Results

Screening stage	Number of records	Explanation
Records from Scopus search stream 1	535	Green HRM/sustainable HRM and communication-related search
Records from Scopus search stream 2	313	Sustainability communication/message-framing and pro-environmental behavior search
Total records identified	848	Combined exports before deduplication
Duplicate title records removed	2	One cross-search duplicate and one duplicate language/version record
Unique records after deduplication	846	Records available for language and relevance screening
Non-English records excluded	1	One French-language record
English-language records screened	845	Title-and-abstract screening corpus
Records excluded at title/abstract stage	820	No central workplace communication, employee, or environmental-behavior relevance
Preliminary records retained	25	Retained for abstract-level descriptive mapping; full-text verification remains pending

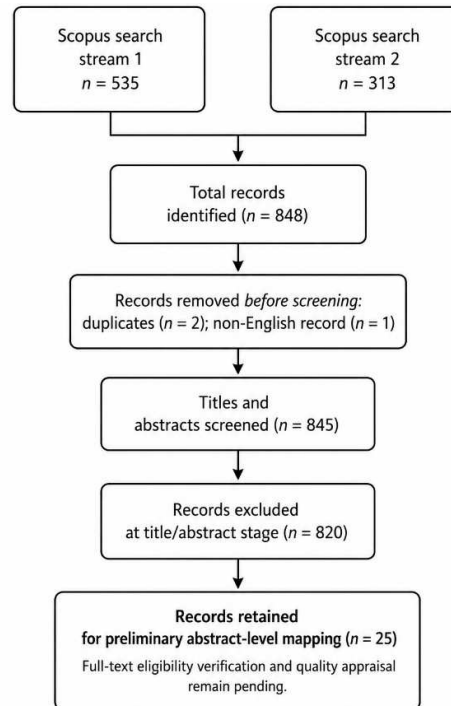


Figure 1. Editable PRISMA-aligned flow of the preliminary Scopus screening.

4.2. Development of the Literature

The earliest retained record was published in 2012 and positioned HR-supported communication as a bridge between sustainability values and organizational practice (De Souza Freitas et al., 2012). Publication activity accelerated after 2022: 17 of the 25 retained records (68%) were published from 2023 to 2027, including 15 (60%) during 2023–2025. The emerging literature increasingly examines message design, role clarity, internal social media, HRM signals, knowledge transfer, and communication inconsistency. The 2027 record was already indexed in the August 2026 export and is treated as online-first or forthcoming. These counts describe the preliminary mapping corpus rather than a quality-appraised final sample.

Table 2. Publication Distribution by Year

Year	Retained records	% of preliminary corpus
2012	1	4.0%
2017	1	4.0%
2018	1	4.0%
2019	2	8.0%
2020	1	4.0%
2021	2	8.0%
2023	6	24.0%
2024	2	8.0%
2025	7	28.0%
2026	1	4.0%
2027	1	4.0%

4.3. Geographic and Sectoral Distribution

The evidence is geographically dispersed but weighted toward Asian and emerging-economy settings, including Taiwan, India, Vietnam, Malaysia, China, the Philippines, Bangladesh, Ghana, and Brazil,

alongside European and United States studies. Sectoral coverage is uneven: 12 studies used cross-sector or general settings, seven examined hospitality or tourism, five focused on manufacturing, and one studied port and logistics employees. Public administration, higher education, healthcare, professional services, small enterprises outside tourism, and remote or hybrid work remain underrepresented.

Table 3. Sectoral and Methodological Profile

Profile dimension	Category	Number	Share
Sector	Cross-sector/general	12	48.0%
Sector	Hospitality/tourism	7	28.0%
Sector	Manufacturing	5	20.0%
Sector	Port/logistics	1	4.0%
Research design	Quantitative survey	13	52.0%
Research design	Qualitative/case	6	24.0%
Research design	Experiment/quasi-experiment	4	16.0%
Research design	Mixed methods	1	4.0%
Research design	Conceptual	1	4.0%

4.4. Methodological Profile

Quantitative surveys dominated the corpus (13 studies; 52%), followed by qualitative or case designs (six; 24%), experiments or quasi-experiments (four; 16%), one mixed-method study, and one conceptual article. Experimental evidence tested peer communication, normative appeals, message framing, and internal social-media congruence, but causal evidence remained much smaller than correlational evidence. Self-reported perceptions and intentions were common, whereas objective behavior and longitudinal outcomes were rare; the principal exception was a three-wave study of greenwashing, corporate hypocrisy, and turnover intention (Robertson et al., 2023).

4.5. Theoretical Foundations

The preliminary corpus draws on signaling, framing and persuasion, social identity, role theory, relationship management, green-climate, trust, and sensemaking perspectives. The theories address different stages rather than offering interchangeable explanations: signaling clarifies how employees infer organizational priorities from Green HRM practices; framing explains how message construction changes evaluation; social-cognitive perspectives explain how self-efficacy and outcome expectations convert interpretation into action; and sensemaking explains responses to ambiguity or contradiction (Garavan et al., 2023; Kang & Kang, 2023; Teng-Calleja et al., 2023). Few retained records connect organizational signals, message design, psychological interpretation, and behavior within a single model. This cross-level gap motivates the provisional integrative framework developed below, while the preliminary screening status prevents treating that framework as empirically validated.

4.6. Communication Strategies Identified in the Literature

Four communication configurations recur. First, HR practices operate as signals through recruitment, training, appraisal, rewards, and statements of direction; credibility depends on signal consistency (Leidner et al., 2019; Garavan et al., 2023). Second, peer, formal, and digital channels differ in authenticity, accessibility, role clarity, and self-efficacy (Potoski & Callery, 2018; Ng et al., 2025; Sun et al., 2025). Third, normative, emotional, gain, and loss frames influence motivation conditionally rather than universally (Kang & Kang, 2023; Decrinis et al., 2023). Fourth, high-quality communication is more effective when employees trust the source and observe supporting resources, training, and feedback (Luu, 2021; Musgrave et al., 2025; Le-Thu et al., 2026).

4.7. Employee Psychological Mechanisms

The coded studies identify cognitive mechanisms such as role clarity, credibility, signal consistency, and sensemaking; motivational mechanisms such as self-efficacy, expectancy, instrumentality, moral attentiveness, and felt responsibility; and affective or relational mechanisms such as environmental passion, green role identity, pride, trust, and communal organization–employee relationships. These mechanisms indicate that sustainability communication shapes not only what employees know but also what they believe they can achieve, what they value, and how they define their role in the organization (Garavan et al., 2023; Luu, 2021; Ng et al., 2025; Sun et al., 2025).

4.8. Behavioral, Employee, and Organizational Outcomes

Employee green behavior was the most frequent outcome, including voluntary green work behavior, environmental-program participation, eco-initiatives, food-waste reduction, green purchasing, and electric-vehicle adoption. Broader outcomes included satisfaction, role clarity, pride, engagement, turnover intention, environmental culture, resource conservation, and performance. Direct effects were not uniformly positive: communication sometimes operated only through visible resource use, training, or other psychological mediators, and misleading environmental claims could increase hypocrisy perceptions and withdrawal (Tom & Soumyaja, 2019; Robertson et al., 2023; Le-Thu et al., 2026).

4.9. Preliminary Thematic Synthesis

Table 4. Preliminary Themes and Evidence Patterns

Theme	Illustrative studies	Dominant mechanism	Preliminary synthesis
HRM practices as signals	Leidner et al. (2019); Garavan et al. (2023); Teng-Calleja et al. (2023); Weigt-Rohrbeck and Linneberg (2025)	Meaning attribution, consistency, moral attentiveness, sensemaking	Employees respond to what HR practices signal about organizational priorities and to whether those signals are coherent and credible.
Internal communication channels	Potoski and Callery (2018); Piwowar-Sulej et al. (2024); Ng et al. (2025); Sun et al. (2025)	Credibility, accessibility, role clarity, self-efficacy	Peer, formal, and digital channels differ in their capacity to make sustainability expectations authentic and actionable.
Message framing and normative appeals	Kang and Kang (2023); Decrinis et al. (2023); Ng et al. (2025)	Expectancy, gain motives, construal fit, self-efficacy	No frame is universally superior; effectiveness depends on message–audience fit, communication channel, and behavioral target.
Communication quality and knowledge transfer	Luu (2021); Musgrave et al. (2025); Le-Thu et al. (2026)	Green role identity, passion, trust, visible resource use	Communication affects behavior more strongly when employees trust the source and observe supporting practices and resources.
Authenticity, ambiguity, and adverse effects	Robertson et al. (2023); Weigt-Rohrbeck and Linneberg (2025); Weder and Stranzl (2025)	Hypocrisy, skepticism, contestation, sensemaking	Greenwashing and ambiguous signals can undermine outcomes, while open internal contestation may strengthen meaningful sustainability engagement.

From employee behavior to organizational outcomes	Tsai et al. (2017); Sakshi et al. (2020); Etse and Adu-Aboagye (2025)	Green climate, resource conservation, behavioral intention	Communication may contribute to environmental and operational outcomes through aggregated employee behavior and organizational practices.
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4.10. Integrative Descriptive Model

The preliminary descriptive patterns motivate a sequential model in which sustainability intentions and Green HRM practices generate communication signals; employees evaluate the signals' clarity, credibility, framing, and relevance; cognitive, motivational, affective, and relational mechanisms shape behavior; and aggregated behavior may contribute to employee and organizational outcomes. Leadership, culture, HRM-system strength, employee participation, industry, national context, and resource availability are positioned as boundary conditions. The model is therefore a provisional theory-building representation of the abstract-level synthesis, not a causal model validated by the present review.

4.11. Preliminary Retained-Record Profile

Table 5 profiles the 25 records retained after title-and-abstract screening and provides an auditable bridge between database exports and the preliminary thematic synthesis. Country, sector, design, communication focus, and outcome labels are based on Scopus metadata and abstracts; items reported as 'not stated' require full-text verification and should not be interpreted as confirmed study characteristics.

Table 5. Characteristics of Preliminary Retained Records

Study	Context/sector	Design	Communication focus	Primary outcome or contribution
De Souza Freitas et al., 2012	Brazil; Cross-sector/company case	Qualitative case study	HR-supported sustainability communication system	Organizational sustainability
Tsai et al., 2017	Taiwan; Port/logistics	Quantitative survey	Green communication as a green-climate dimension	Employee green behavior
Potoski & Callery, 2018	Not stated in abstract; Cross-sector/company offices	Quasi-experimental field study	Peer communication	Environmental employee engagement
Tom & Soumyaja, 2019	India; Hospitality	Quantitative survey	Environmental communication	Employee eco-initiatives
Leidner et al., 2019	European firms; Cross-sector	Qualitative interviews	GHRM policy communication	Green employee behavior
Sakshi et al., 2020	Not stated in abstract; Tourism and hospitality	Quantitative survey	Environmental communication within sustainability practices	Environmental and financial performance
Luu, 2021	Vietnam; Manufacturing/B2B	Quantitative survey	Quality of green communication	Workplace and household food-waste reduction
Sathasivam et al., 2021	Malaysia; Electrical and electronics manufacturing	Qualitative interviews	Effective communication supporting GHRM	Environmental sustainability implementation

Garavan et al., 2023	China; Manufacturing	Quantitative survey	GHRM signals	Voluntary green work behavior
Robertson et al., 2023	Not stated in abstract; Cross-sector	Longitudinal quantitative survey	Corporate environmental claims and greenwashing	Turnover intention
Kang & Kang, 2023	Not stated in abstract; Cross-sector	Experimental studies	Descriptive and injunctive normative appeals	Employee green behavioral decisions
Piwowar-Sulej & Popowicz, 2023	Poland; Cross-sector	Quantitative survey	Effective communication as an organizational green practice	Perceived effectiveness of green practices
Teng-Calleja et al., 2023	Philippines; Cross-sector	Mixed methods	Organizational environmental signals and expectations	Intention to engage in Green HRM
Decrinis et al., 2023	Germany; Automotive manufacturing	Field experiment	Emotional, normative, and gain framing	Employee electric-vehicle adoption
Mashi et al., 2024	Bangladesh; Garment manufacturing	Quantitative survey	Green communication and feedback	Employee green behavior
Piwowar-Sulej et al., 2024	Poland; Cross-sector	Quantitative survey	Internal environmental communication	Greening of organizational culture
Weder & Stranzl, 2025	Conceptual/global; Cross-sector	Conceptual study	Conversational sustainability spaces	Cultivation of sustainability
Etse & Adu-Aboagye, 2025	Ghana; Hospitality	Quantitative survey	Corporate environmental communication	Green purchasing
Weigt-Rohrbeck & Linneberg, 2025	Not stated in abstract; Cross-sector	Qualitative/process study	Ambiguous GHRM signals	Commitment to the green strategy
Ng et al., 2025	Not stated in abstract; Cross-sector	Experimental studies	Internal social-media message framing	Employee green behavior
Weder & Stranzl, 2025	Austria/expert context; Cross-sector	Qualitative exploratory study	Internal sustainability communication and IDGs	Organizational transformation
Sun et al., 2025	United States; Hospitality	Quantitative survey	Internal environmental sustainability communication	Employee green behavior
Musgrave et al., 2025	United Kingdom; Tourism SMEs	Quantitative survey	Pro-environmental knowledge transfer	Sustainable behavioral intention
Le-Thu et al., 2026	Vietnam; Food and beverage/hospitality	Quantitative survey	Green communication	Employee and customer satisfaction
Nguyen et al., 2027	United Kingdom and Vietnam; Hospitality	Embedded qualitative case study	Multi-level sustainability communication	Pro-environmental behavior

The current evidence base permits transparent descriptive mapping and provisional theory development but does not permit quality-weighted, meta-analytic, or definitive causal conclusions. Full-text verification, formal appraisal, independent coding, and integration of additional databases would strengthen the evidence base. The findings should therefore be read as an abstract-level integrative mapping of an emerging field, with each proposition treated as a candidate explanation to be tested rather than a conclusion established by the review.

4.12 Theoretical Integration and Discussion

Across the preliminary retained records, recurring patterns indicate that sustainability communication is embedded in Green HRM practices, organizational signals, managerial enactment, and employee interaction. The discussion therefore uses the abstract-level evidence to integrate message structure, channel, employee interpretation, psychological mechanisms, and supporting or contradictory organizational conditions into a provisional explanatory account. Where the evidence is heterogeneous or indirect, the text distinguishes observed descriptive patterns from reviewer interpretation. The resulting framework and propositions are theory-building devices for future testing, not quality-weighted or causal findings.

a. Sustainability Communication as a Strategic HRM Architecture

The evidence shifts sustainability communication from information dissemination to a constitutive component of Green HRM. Recruitment messages, training, appraisal, rewards, managerial statements, peer conversations, and visible resource allocation jointly signal organizational priorities (De Souza Freitas et al., 2012; Garavan et al., 2023). Formal policies provide consistency, while line managers and peers translate environmental goals into local meaning; peer communication and open contestation can increase authenticity and practical relevance (Potoski & Callery, 2018; Weder & Stranzl, 2025). Communication is therefore strongest when mutually reinforcing HR practices and organizational actions support it and weakest when campaigns are detached from managerial behavior or resources.

b. From Organizational Signals to Employee Sensemaking

Employees evaluate who communicates, why the message is sent, whether it matches prior actions, and what it implies for their role. Clear direction can strengthen participation, whereas ambiguous signals trigger additional sensemaking (Teng-Calleja et al., 2023; Weigt-Rohrbeck & Linneberg, 2025). Dialogue and visible support may resolve ambiguity, but message–practice inconsistency can produce symbolic interpretations, perceived hypocrisy, and withdrawal (Robertson et al., 2023). Models should therefore connect intended Green HRM practices with behavior through perceived clarity, consistency, and authenticity rather than treating exposure as sufficient.

c. Message Framing and Psychological Congruence

Experimental evidence rejects a universally superior frame. Normative, emotional, gain-oriented, and framing–construal combinations can influence behavior, but effects vary by audience, behavioral target, channel, and duration (Kang & Kang, 2023; Decrinis et al., 2023; Ng et al., 2025). The central principle is psychological congruence: messages are more persuasive when their framing and abstraction fit employees' motivational orientation, role, and interpretation of the environmental problem. Framing should thus be modeled as a conditional communication characteristic rather than a universal main effect.

d. Psychological Mechanisms Translating Communication into Action

The evidence suggests a sequence of mechanisms. Employees first interpret message clarity, credibility, and role relevance; they then evaluate capability, expected outcomes, and moral significance through self-efficacy, expectancy, instrumentality, and attentiveness; finally, environmental expectations may become integrated into trust, passion, identification, and green role identity (Garavan et al., 2023; Luu, 2021;

Musgrave et al., 2025; Ng et al., 2025; Sun et al., 2025). This sequence explains why information alone is insufficient and supports future tests of temporally ordered or multiple mediation rather than isolated, interchangeable mediators.

e. Communication Channels, Dialogue, and Employee Participation

Channels shape accessibility, authenticity, and participation. Formal communication provides consistency and legitimacy, peers provide social credibility, internal social media enables interaction and repetition, and line managers translate abstract goals into task-specific expectations (Potoski & Callery, 2018; Ng et al., 2025; Sun et al., 2025). Dialogue and employee voice are therefore part of the mechanism: participative communication enables disagreement, local adaptation, and the development of workable environmental practices (Morsing & Schultz, 2006; Weder & Stranzl, 2025).

f. Organizational Boundary Conditions

Communication effects depend on enabling conditions such as training, visible resource use, leadership, psychological green climate, organizational culture, hierarchy, and channel choice (Dumont et al., 2017; Piwovar-Sulej et al., 2024; Le-Thu et al., 2026). Messages can direct attention and motivation, but employees still need time, knowledge, authority, infrastructure, and reinforcement. Communication should therefore complement, not substitute for, an aligned Green HRM system.

g. Proximal Behavior and Distal Organizational Outcomes

Employee green behavior is the most proximal outcome, whereas satisfaction, productivity, environmental performance, and financial performance are more distant and often indirect. Mixed findings show that communication may require perceived resource support, training, or employee behavior before affecting distal outcomes (Tom & Soumyaja, 2019; Sakshi et al., 2020; Piwovar-Sulej et al., 2024; Le-Thu et al., 2026). Future models should specify the level and temporal distance of each outcome rather than linking messages directly to organizational performance.

h. Authenticity, Greenwashing, and the Dark Side of Communication

Environmental communication can generate adverse outcomes when inaccurate, inconsistent, or manipulative. Greenwashing and ambiguous Green HRM signals can increase hypocrisy perceptions, uncertainty, skepticism, emotional strain, and turnover intentions (Robertson et al., 2023; Weigt-Rohrbeck & Linneberg, 2025; Arafah et al., 2025). Communication quality must therefore be evaluated through truthfulness, internal alignment, evidential support, employee voice, and unintended reactions, not reach and frequency alone.

i. Integrative Framework

The preliminary synthesis motivates a five-stage framework. Stage 1 comprises organizational sustainability intentions and Green HRM practices. Stage 2 comprises communication signals and message characteristics, including source, framing, channel, frequency, consistency, and opportunities for dialogue. Stage 3 comprises employee interpretation and psychological mechanisms, including clarity, credibility, sensemaking, self-efficacy, trust, role identity, moral attentiveness, and perceived hypocrisy. Stage 4 comprises employee pro-environmental work behavior. Stage 5 comprises employee and organizational outcomes. Individual, job, group, organizational, sectoral, and cultural conditions operate across the pathway as boundary conditions. Feedback from employee voice and observed outcomes may also reshape subsequent communication and HR practices. The framework is provisional and requires full-text synthesis and empirical testing.

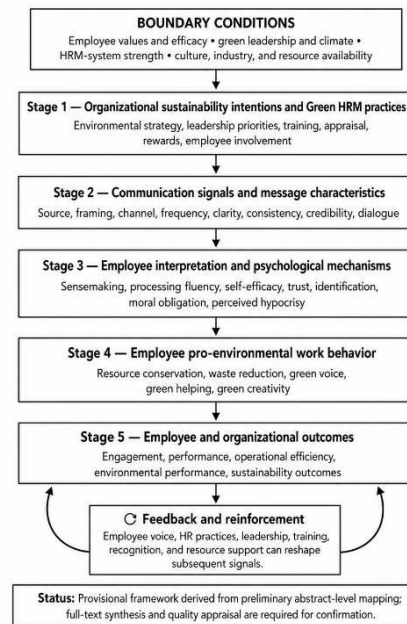


Figure 2. Provisional Integrative Framework of HR Sustainability Communication (editable Word format).

j. Research Propositions

The provisional framework generates the following research propositions. They synthesize recurring abstract-level patterns with the complementary theoretical lenses developed above and are intended as theoretically grounded directions for future empirical testing. They should not be read as effects established by a completed systematic review.

Table 6. Propositions Derived from the Integrative Framework

Proposition	Statement	Indicative evidence base
Proposition 1	The clarity, consistency, and credibility of HR sustainability communication positively influence employees' perceptions that environmental sustainability is an authentic organizational priority.	Bowen & Ostroff (2004); Garavan et al. (2023); Teng-Calleja et al. (2023)
Proposition 2	The relationship between HR sustainability communication and employee pro-environmental behavior is mediated by employees' interpretation of message relevance, role clarity, and organizational authenticity.	Sun et al. (2025); Weigt-Rohrbeck & Linneberg (2025)
Proposition 3	Congruence between message framing and employees' cognitive or motivational orientation strengthens processing fluency, self-efficacy, and the persuasiveness of sustainability messages.	Ng et al. (2025); Su & Li (2024); Rothman & Salovey (1997)
Proposition 4	Self-efficacy, moral attentiveness, trust, green role identity, and environmental passion transmit the effects of sustainability communication to employee green behavior through complementary cognitive, motivational, and identity-based pathways.	Garavan et al. (2023); Luu (2021); Musgrave et al. (2025)

Proposition 5	Participative, peer-supported, and dialogic communication generates stronger employee engagement and behavioral adoption than one-way communication when the environmental behavior requires local interpretation and cooperation.	Potoski & Callery (2018); Morsing & Schultz (2006); Weder & Stranzl (2025)
Proposition 6	Green training, visible organizational resources, leadership support, and a strong green psychological climate strengthen the relationship between sustainability communication and employee pro-environmental behavior.	Dumont et al. (2017); Norton et al. (2017); Le-Thu et al. (2026)
Proposition 7	Inconsistency between environmental messages and enacted organizational practices increases perceived hypocrisy and weakens employee commitment, while potentially increasing withdrawal and turnover intentions.	Robertson et al. (2023); Weigt-Rohrbeck & Linneberg (2025)

4.12. Future Research Agenda

The preliminary synthesis reveals a field that is expanding rapidly but remains theoretically fragmented and methodologically concentrated. The next generation of research should move beyond demonstrating general associations between sustainability communication and favorable employee attitudes. It should identify the mechanisms, conditions, temporal dynamics, and organizational consequences through which specific communication designs produce or fail to produce behavioral change.

a. Integrating Signaling, Framing, and Social-Cognitive Explanations

Future research should integrate the stages currently examined separately: organizational signaling explains what practices communicate, framing explains how consequences are presented, and social-cognitive theory explains how efficacy and outcome expectations translate interpretation into action. Models should distinguish intended, perceived, and enacted communication and use multilevel designs to test whether strong communication creates shared unit-level perceptions or whether disagreement weakens collective green behavior.

b. Establishing Causality and Temporal Persistence

Causal and temporal evidence requires randomized field experiments, natural experiments, longitudinal panels, diary studies, and experience sampling. Studies should manipulate source, frame, channel, frequency, personalization, and dialogue while holding the environmental objective constant, then measure interpretation, psychological mechanisms, behavior, and persistence at separate time points. This sequencing would clarify whether effects decay, become habitual, or are internalized as role expectations.

c. Moving from Intentions to Observable Behavior

Research should move beyond generalized self-reports and intentions by using energy and material use, waste weight, recycling accuracy, participation records, green suggestions, commuting choices, procurement decisions, digital traces, supervisor ratings, and repeated observations. Behavioral targets should also be distinguished by effort, visibility, discretion, and infrastructure dependence because simple conservation, green voice, innovation, and collective process change are unlikely to respond to identical communication designs.

d. Examining Channel Affordances and Communication Configurations

Communication should be disaggregated into source, content, frame, channel, timing, frequency, direction, feedback, and personalization. Factorial or configurational studies can identify combinations of managerial communication, peer discussion, training, feedback, internal social media, and digital nudges that

are sufficient for sustained behavior. Digital research should also consider message saturation, algorithmic personalization, privacy, surveillance, and trust rather than assuming that greater reach is inherently beneficial.

e. Investigating Authenticity and Negative Responses

The adverse effects of communication deserve systematic investigation. Studies should test message–practice gaps, symbolic Green HRM, communication overload, reactance, cynicism, silence, fatigue, emotional exhaustion, and moral disengagement, together with corrective mechanisms such as transparent acknowledgement of limitations, participative design, evidence-based progress reporting, psychological support, and visible resource commitments (Robertson et al., 2023; Arafah et al., 2025).

f. Expanding Contexts and Cross-Cultural Evidence

Evidence should expand beyond hospitality, tourism, and manufacturing to public administration, higher education, healthcare, professional services, logistics, micro and small enterprises, remote work, and platform employment. Cross-country designs should measure cultural orientations, institutional expectations, environmental norms, and communication preferences and establish measurement invariance before comparing structural relationships. This would clarify the generalizability of framing, authenticity, peer influence, and moral obligation.

g. Connecting Employee Behavior with Organizational Performance

Multilevel research should explain how individual behavior accumulates into team, unit, and organizational outcomes such as resource efficiency, service quality, environmental innovation, and sustainability performance. It should also test trade-offs: environmental initiatives can enhance meaning and efficiency but may increase workload or role conflict when unsupported. Productivity measures should distinguish operational savings, task efficiency, contextual performance, innovation, well-being, and longer-term organizational value.

Table 7. Priority Future Research Agenda

Research gap	Illustrative research question	Recommended design	Preferred evidence	Expected contribution
Fragmented theory	How do HRM signals, message frames, and efficacy mechanisms operate sequentially?	Time-separated field study or experiment	Message manipulation; interpretation; efficacy; behavior	Integrated process theory
Cross-sectional dominance	Do message effects persist after communication is withdrawn?	Longitudinal field experiment	Baseline, intervention, post-intervention, follow-up	Temporal persistence and habit formation
Self-report dependence	Which messages change actual rather than intended green behavior?	Randomized intervention with behavioral tracking	Energy, waste, recycling, purchasing, or participation data	Stronger causal and behavioral validity
Aggregate communication measures	Which source–frame–channel combinations are most effective?	Factorial experiment or configurational analysis	Multiple communication attributes and outcomes	Communication architecture rather than single-variable effects
Limited multilevel evidence	How do shared interpretations produce unit-level green performance?	Multilevel longitudinal design	Employees nested in teams and organizations	Cross-level aggregation and HRM system strength

Limited cultural comparison	Do congruence and authenticity operate similarly across countries?	Multi-country study with invariance testing	Cultural orientation, institutional context, comparable measures	Boundary conditions and generalizability
Understudied negative effects	When does sustainability communication produce hypocrisy, reactance, or fatigue?	Scenario experiment plus longitudinal survey	Message–practice gap, skepticism, withdrawal, turnover	Dark-side theory and corrective mechanisms
Weak performance linkage	When does green behavior improve productivity or create role strain?	Multilevel mixed-method study	Objective performance, workload, well-being, environmental outcomes	Balanced sustainability and HR performance model

4.13. Implications

a. Theoretical Implications

The preliminary mapping suggests four theoretical contributions that require confirmation through a completed full-text review. First, it treats sustainability communication as a constitutive HR process linking intended Green HRM practices with employee interpretation rather than as a stand-alone information campaign. Second, it integrates organizational signaling with message framing to show how authenticity and psychological fit may jointly shape effectiveness. Third, it differentiates role clarity, credibility, self-efficacy, trust, moral attentiveness, passion, and identity as potentially sequential mechanisms rather than interchangeable mediators. Fourth, it incorporates negative pathways by explaining how ambiguity, greenwashing, and message-practice inconsistency may undermine legitimacy and contribute to skepticism or withdrawal. These contributions are conceptual extensions of the observed abstract-level patterns, not claims of finalized evidentiary certainty.

b. Managerial Implications

Managers should first audit alignment between environmental claims and actual facilities, time, authority, knowledge, incentives, and leadership behavior. Messages should be designed for specific employee groups and target behaviors and pilot-tested for clarity, credibility, relevance, psychological fit, and unintended reactions. Communication should then be coordinated across policy, line management, peer networks, training, internal media, recognition, and feedback. Employee participation through champions, team dialogue, suggestion systems, and internal forums helps adapt objectives to local constraints. Evaluation should prioritize behavioral and organizational evidence—energy, materials, waste, participation, green ideas, operational savings, authenticity, fatigue, overload, and turnover risk—rather than message reach alone.

c. Policy and Institutional Implications

Professional bodies, regulators, public organizations, and higher education institutions should treat internal sustainability communication as part of environmental governance. Guidance should address how expectations are communicated, enacted by line managers, supported by resources, opened to participation, and evaluated through measurable targets and employee behavior. Transparent reporting and visible follow-through are especially important where gaps between public sustainability commitments and internal practice may undermine institutional legitimacy.

V. Conclusion

This preliminary integrative mapping suggests that sustainability communication can be conceptualized as a strategic mechanism through which HRM translates environmental intentions into employee understanding and action. Across the retained abstract level evidence, communication appears to signal priorities, frame consequences, clarify roles, support efficacy and trust, activate identity and moral attention, and shape pro environmental work behavior. The strength and direction of these processes appear contingent on psychological congruence, credible and participative channels, training, visible resources, leadership, green climate, HRM system strength, and consistency between communicated values and enacted practice. The principal theory building contribution is a provisional five stage framework connecting organizational sustainability intentions and Green HRM practices with communication signals, employee interpretation and psychological mechanisms, pro environmental behavior, and employee and organizational outcomes. The framework integrates signaling, framing, social cognitive, construal, and sensemaking explanations while recognizing feedback, dialogue, adverse responses, and multilevel boundary conditions. It should be interpreted as an organizing account of recurring patterns rather than a validated causal structure. When messages and practices align, communication may support engagement, conservation, innovation, and sustainability; when they conflict, ambiguity, hypocrisy, skepticism, exhaustion, and withdrawal may result.

For practice, the synthesis suggests replacing generic sustainability campaigns with coherent communication systems supported by resources, managerial enactment, employee participation, and behavioral evaluation. For research, priority should be given to causal, longitudinal, multilevel, cross cultural, and behaviorally grounded designs. For review completion, full text eligibility verification, independent quality appraisal, coding agreement, and database sensitivity checks are necessary before the proposed framework and propositions can be confirmed, refined, or challenged. This review is limited by its reliance on two Scopus exports, English language journal records, and title and abstract coding. The 25 record mapping corpus has not undergone complete full text eligibility verification, formal quality weighting, or independent double coding, and Web of Science and regional sources were not integrated. Terminological heterogeneity may also have excluded relevant studies that discuss signaling, sensemaking, or green climate without using sustainability communication terminology. The mixed theoretical and methodological evidence prevents effect size aggregation and requires interpretive coding. These constraints mean that the findings are best understood as a preliminary integrative mapping and theory building synthesis. The highest priority next review steps are to retrieve and verify all candidate full texts, document exclusion reasons, apply MMAT or design appropriate appraisal criteria independently, reconcile coding through consensus, report reviewer agreement, and conduct database and sensitivity checks before the framework is treated as a completed systematic synthesis.

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