P-ISSN: 2709-6254	Journal of Development and Social Sciences	Jan-Feb 2026, Vol. 7, No. 1
O-ISSN:2709-6262	https://doi.org/10.47205/jdss.2026(7-I)11	[121-135]

Journal of Development and Social Sciences
www.jdss.org.pk

RESEARCH PAPER

Credible Green HRM and Employee Green Behaviour in Pakistani Banks: The Roles of Green Psychological Climate and Perceived Greenwashing

[1]Farhan Ali Soomro and [2]Mansoor Ahmed Soomro

1. Assistant Professor, Department of Public Administration, Shah Abdul Latif University, Khairpur Mir's, Sindh, Pakistan
2. Assistant Professor, Department of Busienss Administration, Shah Abdul Latif University, Shahdadkot Campus, Sindh, Pakistan

Corresponding Author: farhan.soomro@salu.edu.pk

ABSTRACT:

The main objective of this study is to examine how green human resource management (GHRM) practices influence employee green behaviour (EGB) in the context of Pakistani commercial banks by focusing on the mediating role of green psychological climate (GPC) and the moderating role of perceived greenwashing. Drawing on ability motivation opportunity theory, social exchange theory, and signalling and legitimacy perspectives, the study proposes that GHRM practices foster a shared perception that environmental sustainability is valued and supported, which in turn encourages both in-role and extra-role green behaviour. At the same time, perceptions of greenwashing are expected to weaken the credibility of green HR signals. Data were collected through a questionnaire survey administered via Google Forms to employees working in commercial banks operating in Pakistan. Out of 500 distributed questionnaires, 203 usable responses were obtained, yielding a valid response rate of 40.6%. The hypothesized moderated mediation model was tested using partial least squares structural equation modelling (PLS-SEM) with bootstrapping procedures. Measurement quality was evaluated using established criteria for reliability and validity. The findings indicate that GHRM practices are positively associated with green psychological climate, which in turn predicts both in-role and extra-role employee green behaviour. Perceived greenwashing negatively moderates the relationship between GHRM and green psychological climate, such that the indirect effect is weaker when greenwashing perceptions are high. Banking organizations should ensure internal credibility and authenticity in green HR systems to strengthen employee engagement in environmental sustainability.

KEYWORDS Green Human Resource Management, Green Psychological Climate, Employee Green Behaviour, Perceived Greenwashing, Moderated Mediation, Partial Least Squares Structural Equation Modelling, Banking Sector, Pakistan

Introduction

Environmental sustainability has become a strategic and ethical imperative for organizations, including service industries whose environmental impact is often indirect yet substantial through energy consumption, paper use, procurement, travel, waste, and financed emissions. Banking sector also face distinctive stakeholder scrutiny: regulators, investors, and customers increasingly evaluate whether financial institutions are authentically integrating environmental considerations into operations and culture rather than merely communicating symbolic initiatives (Coen et al., 2022). In this environment, employee-level engagement matters in a greater deal. When employees consistently reduce resource use, support green initiatives, and go well beyond formal job requirements to champion sustainability, banks can stop relying on one-off campaigns and build habits into how they work.

Human resource management is frequently positioned as a primary mechanism for shaping employees' capabilities, motivation, and opportunities to enact sustainability in daily work. The GHRM literature argues that hiring for environmental values, providing sustainability training, rewarding green performance, and involving employees in environmental decisions together encourage employees to adopt greener behaviours (Renwick et al., 2013; Dumont et al., 2017; Tang et al., 2018; Ramus and Steger, 2000; Pfeffer, 2010). Despite this progress, two key gaps persist. One is the need to better explain how HR systems shape employee green behaviour (EGB) in service contexts, where green outcomes arise from employees' everyday micro-actions rather than tightly controlled production processes. Second, the credibility of green claims has become contested. The emergence of greenwashing misleading impressions about environmental performance or benefits—can create skepticism among internal stakeholders, not only external consumers and investors (Delmas and Burbano, 2011; Walker and Wan, 2012; Seele and Gatti, 2017; Gatti et al., 2021). When employees perceive that green initiatives are symbolic or decoupled from real practices, the same HR signals may be discounted or even backfire (Babu et al., 2020; Robertson et al., 2023; Lauriano et al., 2022). Prior evidence from Pakistan suggests that employee engagement and discretionary effort are strongly shaped by perceptions of organizational trust and credibility, especially in contexts of uncertainty and heightened scrutiny. This highlights the importance of credibility-based mechanisms in influencing how employees respond to organizational initiatives (Khawaja and Ahmed, 2021).

This study addresses these research gaps by developing and testing a moderated mediation model in Pakistan's commercial banking sector. Pakistan provides an analytically important setting for three reasons. To begin with, as in many emerging economies, it confronts significant environmental pressures and resource limitations, making small, low-cost employee actions (e.g., paper reduction, energy conservation, responsible procurement) collectively impactful. Second, Pakistani banks operate in a regulated, reputation-sensitive sector, where sustainability communication may be incentivized yet difficult to substantiate across geographically dispersed branches (Coen et al., 2022). Third, emerging-market institutional contexts are often marked by inconsistent enforcement and heterogeneous stakeholder demands, making symbolic adoption more likely and increasing the risk that employees perceive organizational efforts as greenwashing (Robertson et al., 2023).

We conceptualize *credible* GHRM as an integrated bundle of green-oriented HR practices: green recruitment and selection, green training and development, green performance appraisal, green rewards, and green involvement. We propose that GHRM shapes employee perceptions of a green psychological climate (GPC) a shared sense that policies, practices, and norms support environmental sustainability (Norton et al., 2014, 2017; Sabokro et al., 2021). GPC, in turn, drives both in-role and extra-role employee green behaviours (Tian and Robertson, 2019). Crucially, we argue that perceived greenwashing weakens (a) the effect of GHRM on GPC and (b) the resulting indirect effect on EGB. The logic integrates ability– motivation–opportunity (AMO) theory for how HR systems enable green action (Renwick et al., 2013; Yu et al., 2020), social exchange theory for why employees reciprocate perceived organizational sincerity with discretionary effort (Cropanzano and Mitchell, 2005), and signalling/legitimacy perspectives for how message credibility is established or undermined under perceived decoupling (Spence, 1973; Delmas and Burbano, 2011; Seele and Gatti, 2017; Bowen and Aragon-Correa, 2014; Kim and Lyon, 2015).

Literature Review

Green Human Resource Management in Contemporary Organizations

GHRM refers to HR policies and practices that align how employees are managed with environmental sustainability goals (Renwick et al., 2013). The dominant

conceptualization treats GHRM as a *bundle* of mutually reinforcing practices rather than isolated interventions, consistent with HR systems theory. Such bundles commonly include: (1) green recruitment and selection (attracting and selecting candidates with pro-environmental values), (2) green training and development (building environmental knowledge and skills), (3) green performance management (integrating environmental criteria into appraisal), (4) green rewards and recognition (monetary and non-monetary incentives for environmental contributions), and (5) green involvement (participation mechanisms, suggestion schemes, and empowerment in green initiatives) (Tang et al., 2018; Dumont et al., 2017; Paille et al.´ , 2020; Chaudhary, 2020).

A consistent theme is that GHRM can influence environmental outcomes through employee behaviour. For example, Dumont et al. (2017) provided evidence that GHRM affects in-role and extra-role workplace green behaviours via psychological green climate and green values. Complementary evidence from diverse settings also links GHRM to pro-environmental behaviour at work, including in service contexts where discretionary effort and local enactment are central (Saeed et al., 2019; Chaudhary, 2020; Paille and´ Mejia-Morelos, 2019). Scale development and validation work has also enabled empirical accumulation by offering reliable measurement of core GHRM practices (Tang et al., 2018). More recent work further suggests that the effectiveness of green HR systems may hinge on relational and motivational channels (e.g., empowerment, psychological climate, and perceived organizational support) through which employees interpret and enact green expectations (Khan and Muktar, 2024; Sabokro et al., 2021).

Employee Green Behaviour: In-Role and Extra-Role Dimensions

Employee green behaviour (EGB) encompasses actions by employees that reduce environmental harm or improve environmental performance at work. EGB is often distinguished into in-role behaviours (task related behaviours expected as part of the job) and extra-role behaviours (discretionary behaviours beyond formal requirements) (Dumont et al., 2017). Research on pro-environmental behaviour offers validated measures that capture common workplace green actions, such as energy and resource conservation, waste reduction, and advocacy for greener practices (Robertson and Barling, 2013; Boiral and Paille´, 2012).

From a management perspective, extra-role green behaviour is especially important because it reflects intrinsic commitment and initiative: employees propose ideas, volunteer for green projects, help coworkers adopt sustainable practices, and participate in environmental programs (Boiral and Paille´, 2012). The extra-role green contribution made by employees can be in the form of promoting paperless practices, offering paperless advice to the customers or be part of local environmental campaigns in relation to CSR that the bank is involved in. It has also been shown in previous research that the employee-level environmental engagement gets strengthened when the employees recognize fairness, reciprocally, and consistency in organizational support to sustainability (Tian and Robertson, 2019; Paille´ and Mejia-Morelos, 2019).

Green Psychological Climate as a Mechanism

Psychological climate refers to individual-level perceptions of organizational policies, practices, and procedures. A *green* psychological climate (GPC) captures employees' perceptions that the organization prioritizes and supports environmental sustainability (Norton et al., 2014, 2017). Theory suggests that GPC affects behaviour in multiple ways by setting normative expectations, increasing perceived behavioural control through clearer priorities and resources, and signalling organizational support for green behaviours.

Evidence supports GPC as a mediator between organizational sustainability policies and employee green behaviour (Norton et al., 2014). Evidence from daily diary research suggests that GPC influences the extent to which intentions are enacted in day-to-day behaviour (Norton et al., 2017). In the GHRM domain, climate is often presented as a key social-cognitive mechanism: HR systems serve as "strong situations" that communicate consistent expectations and norms. Where HR signals are coherent and reinforced through appraisal and rewards, climate perceptions are more likely to converge across employees. Empirical work in GHRM similarly indicates that GPC (and related green climate constructs) can transmit the effects of green HR practices to employee green behaviour (Sabokro et al., 2021).

Perceived Greenwashing and Symbolic Management

Greenwashing broadly denotes practices that create misleading impressions about environmental performance, often by emphasizing symbolic actions ("green talk") while substantive actions ("green walk") lag behind (Delmas and Burbano, 2011; Walker and Wan, 2012; Bansal and Clelland, 2004). Contemporary scholarship also emphasizes that greenwashing is co-constructed: accusations and legitimacy struggle among organizations and stakeholders define what counts as misleading (Seele and Gatti, 2017). Related work on sustainability communication also notes that credibility depends on whether external claims are supported by verifiable practices and consistent signals, rather than certification or messaging alone (Heras-Saizarbitoria et al., 2020; Coen et al., 2022).

While much greenwashing research examines consumer and investor responses, employees are also critical audiences. Internal greenwashing perceptions can reduce trust, generate cynicism, and undermine engagement (Robertson et al., 2023). Research on employee reactions to organizational hypocrisy and aspirational sustainability talk further suggests that such perceptions can shape moral judgments and reduce willingness to engage in discretionary, supportive behaviours (Babu et al., 2020; Lauriano et al., 2022; Testa et al., 2020; Onkila, 2015). These dynamics are consistent with broader evidence that misleading "green" information can alter stakeholder intentions and evaluations, reinforcing the centrality of credibility (Gatti et al., 2021).

Theoretical Foundation

We combine three theoretical perspectives to construct a model of the Pakistani banks that is internally plausible and testable: an AMO theory, the social exchange theory, and the signalling/ legitimacy perspectives.

AMO Theory and Green HR Bundles

AMO Theory and Green HR Bundles In this section, the literature review of the topic under consideration is presented. AMO theory indicates that abilities (A), motivation (M), and opportunities to participate (O) determine the performance of employees. HR systems impact the results through the improvement of these elements. GHRM practices may build the environmental capabilities in a worker by training them, enhance motivation by appraisal, rewards, and build opportunity by involvement mechanisms in the sustainability context (Renwick et al., 2013; Tang et al., 2018; Yu et al., 2020; Paille et al.´ , 2020). Ability in banks comprises knowledge relating to resource saving practices (paperless processes, energy conservation), motivational factors (incentives, performance standards) that appreciate environmental adherence and initiative and opportunities (empowerment to propose process changes and join green programs). Recent studies further point out that HR design that is focused on empowerment may be a key to transforming green HR systems into sustainable performance results, which supports the logic of the AMO argument that the opportunity structures are important in enacting green (Khan and Muktar, 2024).

Social Exchange Theory and Reciprocity for Authentic Sustainability

The social exchange theory (SET) maintains that the employees are returning the perceived organisational support and fair treatment with high attitudes and discretionary behaviours to the organisation (Cropanzano and Mitchell, 2005). Employees can pay back through EGB when they feel that the organization really takes the concept of sustainability seriously not as a marketing strategy but as an aspect of HR practices (extra-role green actions) are taken into consideration) they may do the same (Tian and Robertson, 2019). The perceptions of climate will act as an interpretive frame: as the employees perceive a climate of green support, they will assume that the organization cares about sustainability and will endorse green contributions. With that said, the introduction of sustainability cues by HR can be used to create a psychological contract where the contributions to green are rewarded and returned in exchange (Paille and Mejia-Morelos´, 2019).

However, social exchange is dependent on trust and perceived sincerity. When employees are exposed to greenwashing, they might take green HR communications as being manipulative or symbolic, and less felt obligated to reciprocate. In line with this perspective, studies regarding how employees react to greenwashing and organizational hypocrisy suggest that the perceived discrepancy between the aspirational statements and real activities can evoke moral evaluations, cynicism, and lower supportive action behaviour is triggered by perceived inconsistency between the aspirational statements and the actual behaviour of the organization-in-practice-equilibriums (Robertson et al., 2023; Babu et al., 2020; Lauriano et al., 2022).

Signalling and Legitimacy Under Perceived Greenwashing

According to signalling theory, the information communicated within organizations is based on asymmetric conditions, the receivers derive unobserved characteristics based on the signal especially when the signal is expensive, uniform, and hard to counterfeit (Spence1973). The HR practices can serve as internal indicators of environmental priorities: integrating green considerations into recruitment, appraisal, and rewards is more plausible than greenwashing campaigns due to the administrative expenses and possible trade-offs involved in it (Paille et al.´ , 2020). There is also related evidence that indicates that sustainability communication is more likely to be seen as credible when it is backed by verifiable and consistent organizational practices as opposed to symbolic messaging alone in isolation of the former (Heras-Saizarbitoria et al., 2020; Crilly, 2012; Christmann and Taylor, 2006).

Conceptual Model and Hypotheses Development

Grounded in the green human resource management (GHRM) literature, this study theorizes that a coherent bundle of green HR practices shapes employee green behaviour (EGB) by creating a shared interpretive context in which environmental sustainability is perceived as valued, supported, and expected. In service organizations such as banks, environmental performance is strongly dependent on employees' daily routines and discretionary contributions (e.g., paperless processing, energy conservation, and voluntary participation in green initiatives). Accordingly, the model (Figure 1) positions green psychological climate (GPC) as a proximal mechanism linking HR systems to green behaviour, while perceived greenwashing is introduced as a credibility-based boundary condition that undermines the translation of HR signals into a shared climate (Coen et al., 2022; Robertson et al., 2023). The following hypotheses are developed for empirical testing.

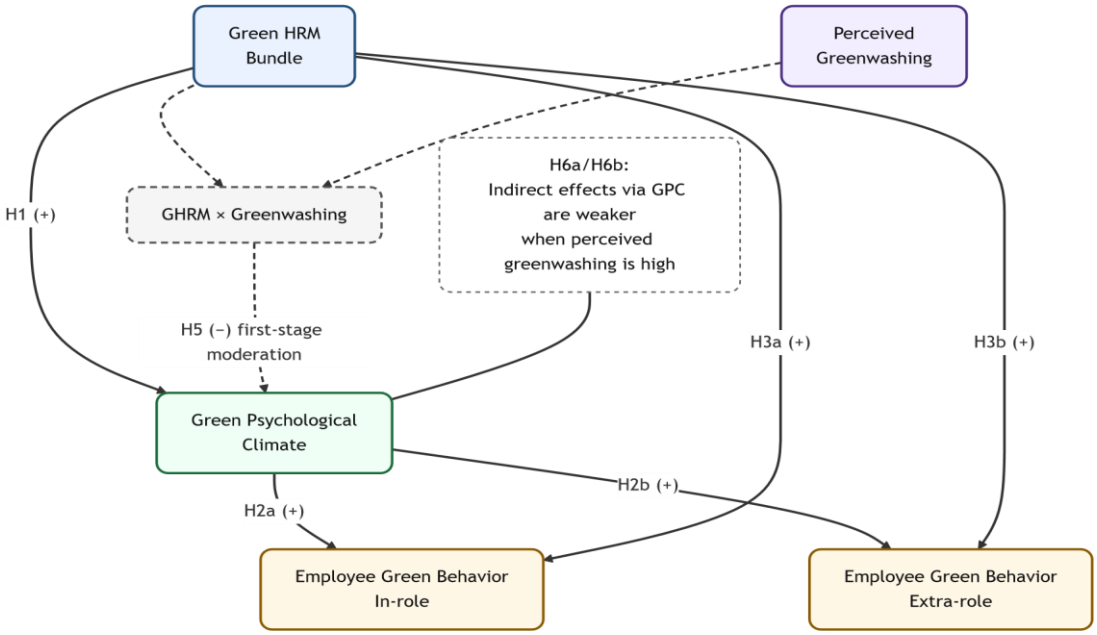

Figure 1: Conceptual framework linking GHRM to employee green behaviour via green psychological climate, with perceived greenwashing as a first-stage moderator.

Hypotheses

H1: GHRM practices are positively related to green psychological climate
H2a: Green psychological climate is positively related to employees' in-role green behaviour.
H2b: Green psychological climate is positively related to employees' extra-role green behaviour.
H3a: GHRM practices are positively related to employees' in-role green behaviour.
H3b: GHRM practices are positively related to employees' extra-role green behaviour.
H4a: Green psychological climate mediates the relationship between GHRM practices and in-role green behaviour.
H4b: Green psychological climate mediates the relationship between GHRM practices and extra-role green behaviour.
H5: Perceived greenwashing negatively moderates the relationship between GHRM practices and green psychological climate, such that the positive relationship is weaker when perceived greenwashing is high.
H6a: Perceived greenwashing negatively moderates the indirect effect of GHRM practices on in-role green behaviour via green psychological climate.
H6b: Perceived greenwashing negatively moderates the indirect effect of GHRM practices on extrarole green behaviour via green psychological climate.

Material and Methods

Research design and context

The study employed a questionnaire survey design to examine how green human resource management

Sampling frame, data collection, and response rate

The sampling frame comprised full-time employees working in commercial banks operating in Pakistan, including both branch-based and head-office staff. Data were collected using an online questionnaire administered through Google Forms, distributed via organizational contacts and professional networks. A total of 500 invitations were

disseminated, and 203 usable questionnaires were retained after screening, yielding a valid response rate of 40.6% (203/500).

Measurement model evaluation

Measurement quality was evaluated prior to hypothesis testing to ensure that latent constructs were operationalized reliably and distinctively. For reflective measurement models, indicator reliability was assessed using outer loadings, with values above 0.70 preferred; items with slightly lower loadings can be retained where theoretical justification is strong and where construct-level convergent validity remains adequate. Internal consistency reliability was assessed using Cronbach's alpha and composite reliability (CR), with values above 0.70 indicating acceptable reliability and values substantially above 0.95 treated cautiously as potential redundancy. Convergent validity was evaluated using the average variance extracted (AVE), with AVE exceeding 0.50 indicating that a construct explains more than half of the variance in its indicators. Discriminant validity was assessed using the heterotrich mono trait (HTMT) ratio, using established cutoffs (typically 0.85 or 0.90 depending on construct conceptual proximity) and, where applicable, bootstrapped confidence intervals for HTMT that should not include 1.00.

Structural model evaluation, mediation, and moderation

After establishing acceptable measurement properties, the structural model was evaluated to test the hypothesized relationships. Collinearity among predictors was assessed using inner variance inflation factors (VIF), with values below conventional thresholds indicating that path estimates are unlikely to be distorted by multicollinearity. Hypotheses were tested using path coefficients estimated by the PLS algorithm, with statistical inference obtained via bootstrapping procedures (e.g., several thousand resamples) to generate standard errors, confidence intervals, and significance levels. The explanatory power of the model was assessed using coefficients of determination (R^2) for endogenous constructs, and substantive interpretation was further supported through effect size estimates (f^2), which indicate the incremental contribution of each predictor to explained variance. Predictive relevance can additionally be evaluated through out-of-sample prediction procedures such as PLS-predict, consistent with calls to complement explanatory modelling with predictive assessment in PLS-SEM research (Hair et al., 2019).

Mediation was tested by estimating the indirect effects of GHRM on employee green behaviour through green psychological climate using bootstrapping, which provides distribution-free confidence intervals for indirect effects. Moderation was tested by specifying an interaction term between GHRM and perceived greenwashing as a predictor of green psychological climate, consistent with the hypothesized first-stage moderation. When higher-order constructs are involved, a two-stage approach is commonly used to form the interaction term using latent variable scores, thereby enabling efficient estimation of the moderation effect. Moderated mediation was assessed by estimating conditional indirect effects at meaningful levels of perceived greenwashing (e.g., low and high values operationalized as −1 SD and +1 SD) and by reporting an index of moderated mediation with bootstrapped confidence intervals. Evidence of moderated mediation is inferred when the index confidence interval excludes zero and when conditional indirect effects differ in magnitude in the theoretically expected direction, consistent with the premise that credibility perceptions (e.g., greenwashing) can shape employees' interpretation of organizational sustainability signals (Robertson et al., 2023).

Results and Discussion

The final sample comprised 203 usable responses from employees of commercial banks operating in Pakistan, representing a valid response rate of 40.6% (203/500). The sample included both branch based and head-office employees, reflecting the distributed

structure through which HR policies and sustainability initiatives are enacted in banking. As reported in Table 1, the sample was predominantly male (71.4%, *n* = 145) with females comprising 28.6% (*n* = 58). Most respondents were aged 26–35 years (53.7%, *n* = 109), followed by 36–45 years (22.7%, *n* = 46), 18–25 years (16.7%, *n* = 34), and 46+ (6.9%, *n* = 14). In terms of work setting, 70.0% (*n* = 142) were branch-based and 30.0% (*n* = 61) were from head-office units, supporting the relevance of examining climate formation across dispersed units.

Preliminary assessment of the study variables indicated adequate dispersion and no anomalous patterns in the observed distributions. Table 2 reports descriptive statistics and inter-construct correlations. Respondents reported moderate-to-high perceived GHRM (Mean= 3.54, SD= 0.71) and green psychological climate (Mean= 3.49, SD= 0.73). In-role EGB was slightly higher (Mean= 3.62, SD= 0.66) than extra-role EGB (Mean= 3.37, SD= 0.75), consistent with the notion that compliance-aligned behaviours are easier to sustain than discretionary behaviours in organizational settings. Perceived greenwashing (PGW) was mid-range (Mean= 3.02, SD= 0.82), indicating meaningful heterogeneity in employees' assessments of the authenticity of sustainability initiatives.

The correlation pattern in Table 2 aligns with theoretical expectations. Perceived GHRM was positively correlated with GPC (*r* = 0.56), in-role EGB (*r* = 0.41), and extra-role EGB (*r* = 0.38). In contrast, PGW was negatively correlated with GHRM (*r* =−0.28), GPC (*r* =−0.42), in-role EGB (*r* =−0.25), and extra-role EGB (*r* =−0.31). GPC showed moderate positive correlations with in-role EGB (*r* = 0.52) and extra-role EGB (*r* = 0.55), and the two EGB dimensions were strongly related (*r* = 0.63). Collectively, these descriptive patterns provide an initial indication that GHRM is associated with stronger green climate and behaviour, while credibility concerns (PGW) are associated with weaker climate and behavioural engagement.

Table 1
Sample profile

Characteristic	Category	n	%
Gender	Male	145	71.4
	Female	58	28.6
Age	18–25	34	16.7
	26–35	109	53.7
	36–45	46	22.7
	46+	14	6.9
Unit type	Branch	142	70.0
	Head office	61	30.0

Notes: *N* = 203. Percentages may not sum to 100 due to rounding.

Table 2
Descriptive statistics and correlations

Construct	Mean	SD	1	2	3	4	5
1. GHRM	3.54	0.71	1				
2. PGW	3.02	0.82	-0.28	1			
3. GPC	3.49	0.73	0.56	-0.42	1		
4. EGB-in	3.62	0.66	0.41	-0.25	0.52	1	
5. EGB-ex	3.37	0.75	0.38	-0.31	0.55	0.63	1

Notes: *N* = 203. Correlations are Pearson correlations. In-role EGB = task-aligned employee green behaviour; Extra-role EGB = discretionary employee green behaviour.

Measurement model assessment

The measurement model was evaluated prior to hypothesis testing to establish the adequacy of construct operationalization. Table 3 summarizes internal consistency

reliability and convergent validity. All constructs demonstrated strong internal consistency: Cronbach's alpha ranged from 0.86 (EGB-in) to 0.92 (GHRM HOC), and composite reliability (CR) ranged from 0.90 (EGB-in) to 0.94 (GHRM HOC). Convergent validity was supported for all constructs, with AVE values exceeding the 0.50 benchmark (ranging from 0.62 for GHRM HOC to 0.69 for GPC). These results indicate that the indicators consistently capture their intended latent constructs and that each construct explains a majority of variance in its indicators.

Discriminant validity was assessed using the hetero trait mono trait (HTMT) criterion (Table 4). All

HTMT values were below conservative cutoffs, indicating adequate construct distinctiveness. The highest HTMT value was observed between the two green behaviour dimensions (EGB-in and EGB-ex; HTMT= 0.78), which is expected given their conceptual relatedness but remains below common thresholds. Other notable HTMT values include GPC with EGB-ex (0.71) and GHRM with GPC (0.69), reflecting theoretically consistent proximity without indicating problematic overlap.

Table 3
Reliability and convergent validity

Construct	α	CR	AVE
GHRM (HOC score)	0.92	0.94	0.62
PGW	0.88	0.91	0.67
GPC	0.90	0.93	0.69
EGB (in-role)	0.86	0.90	0.64
EGB (extra-role)	0.89	0.92	0.66

Notes: α = Cronbach's alpha; CR = composite reliability; AVE = average variance extracted; HOC = higher-order construct.

Table 4
Discriminant validity (HTMT)

	GHRM	PGW	GPC	EGB-in	EGB-ex
GHRM	—				
PGW	0.41	—			
GPC	0.69	0.52	—		
EGB-in	0.58	0.35	0.66	—	
EGB-ex	0.61	0.43	0.71	0.78	—

Notes: HTMT = hetero trait–mono trait ratio. In applied reporting, HTMT bootstrapped confidence intervals can be added to confirm that intervals do not include 1.00.

Structural model results: direct effects, mediation, moderation, and moderated mediation

The structural model was assessed by examining collinearity, explanatory power, and the statistical significance of hypothesized paths. Collinearity diagnostics indicated no problematic multicollinearity among predictors (inner VIFs below conventional cut-offs). The model explained a substantial portion of variance in green psychological climate (R^2 = 0.40) and meaningful variance in employee green behaviour (R^2 = 0.33 for in-role and R^2 = 0.36 for extra-role), indicating that the proposed mechanisms capture important drivers of employee green behaviour in the banking context (Table 5).

Table 5 reports path coefficients and hypothesis tests. Supporting H1, GHRM had a strong positive association with GPC (β= 0.49, t = 8.10, p < 0.001). Supporting H2a and H2b, GPC was positively associated with both in-role EGB (β= 0.46, t = 6.90, p < 0.001) and extra-role EGB (β= 0.50, t = 7.60, p < 0.001). Regarding direct effects (H3a–H3b), GHRM showed a

positive direct association with in-role EGB (β= 0.18, t = 2.40, p = 0.017), supporting H3a. However, the direct effect of GHRM on extra-role EGB was weaker and did not reach conventional significance (β= 0.12, t = 1.85, p = 0.065), leading to non-support for H3b. This pattern suggests that discretionary green behaviour is explained more by the climate pathway than by a direct HR-to-behaviour route.

Mediation and moderated mediation results are reported in Table 6. Supporting H4a and H4b, the indirect effects of GHRM on in-role EGB (β = 0.23, boot CI: 0.15 to 0.33, p < 0.001) and extra-role EGB (β= 0.25, boot CI: 0.16 to 0.36, p < 0.001) via GPC were positive and statistically significant. For moderation (H5), the interaction term GHRM×PGW negatively predicted GPC ($_{\beta}$=−0.17, t = 2.70, p = 0.007), indicating that perceived greenwashing weakens the extent to which green HR practices translate into a shared green climate (Table 5). This finding is consistent with the broader argument that credibility concerns reduce the effectiveness of internal sustainability signals (Robertson et al., 2023; Coen et al., 2022).

Consistent with first stage moderated mediation (H6a–H6b), conditional indirect effects differed by perceived greenwashing (Table 6). For in-role EGB, the indirect effect was stronger when PGW was low (β= 0.29, CI: 0.18 to 0.42) than when PGW was high (β= 0.18, CI: 0.09 to 0.30), and the index of moderated mediation was negative and significant (−0.06, CI: −0.11 to −0.02, p = 0.004), supporting H6a. For extra-role EGB, the indirect effect was likewise stronger at low PGW (β = 0.31, CI: 0.19 to 0.45) than at high PGW (β= 0.20, CI: 0.10 to 0.34), with a negative and significant index of moderated mediation (−0.06, CI: −0.12 to −0.02, p = 0.003), supporting H6b. Overall, the results indicate that GHRM contributes to employee green behaviour primarily through building a green psychological climate, but that this climate-building process is attenuated when employees perceive greenwashing.

Table 5
Structural path estimates

Hypothesis	Path	β	t	p	Decision
H1	GHRM → GPC	0.49	8.10	< 0.001	Supported
H2a	GPC → EGB-in	0.46	6.90	< 0.001	Supported
H2b	GPC → EGB-ex	0.50	7.60	< 0.001	Supported
H3a	GHRM → EGB-in	0.18	2.40	0.017	Supported
H3b	GHRM → EGB-ex	0.12	1.85	0.065	Not supported
H5	GHRM×PGW → GPC	-0.17	2.70	0.007	Supported
	R^2(GPC)	0.40			
	R^2(EGB-in)	0.33			
	R^2(EGB-ex)	0.36			

Notes: Path coefficients are standardized. R^2 values report explained variance of endogenous constructs. In applied reporting, inner VIF and effect sizes (f^2) can be added.

Table 6
Mediation and moderated mediation results

Effect	Condition			Indirect β	Boot CI (LL, UL)	p
H4a: GHRM→GPC→EGB-in	Overall			0.23	(0.15, 0.33)	< 0.001
H4b: GHRM→GPC→EGB-ex	Overall			0.25	(0.16, 0.36)	< 0.001
→			−1SD)	0.29	(0.18, 0.42)	< 0.001
			+1SD)	0.18	(0.09, 0.30)	< 0.001
→			−1SD)	0.31	(0.19, 0.45)	< 0.001
	+1SD)	0.20	(0.10, 0.34)	< 0.001		

Notes: Boot CI = bootstrapped confidence interval. Conditional indirect effects are computed at low and high levels of perceived greenwashing. In applied reporting, the number of bootstrap resamples and confidence level (e.g., 95%) should be stated.

Interaction pattern

To aid interpretation of the moderation effect, the interaction was probed using simple slopes of the

GHRM→GPC relationship at low and high levels of perceived greenwashing (e.g., −1 SD and +1 SD). Consistent with the negative interaction reported in Table 5 (β=−0.17, p = 0.007), the plotted pattern in Figure 2 indicates that GHRM more strongly predicts green psychological climate when perceived greenwashing is low, whereas the slope is attenuated under high perceived greenwashing. This interaction supports the credibility-based interpretation that when employees doubt the authenticity of sustainability initiatives, the same HR practices are less likely to consolidate into shared climate perceptions and, consequently, less likely to generate downstream green behaviour through the climate pathway (Robertson et al., 2023; Coen et al., 2022).

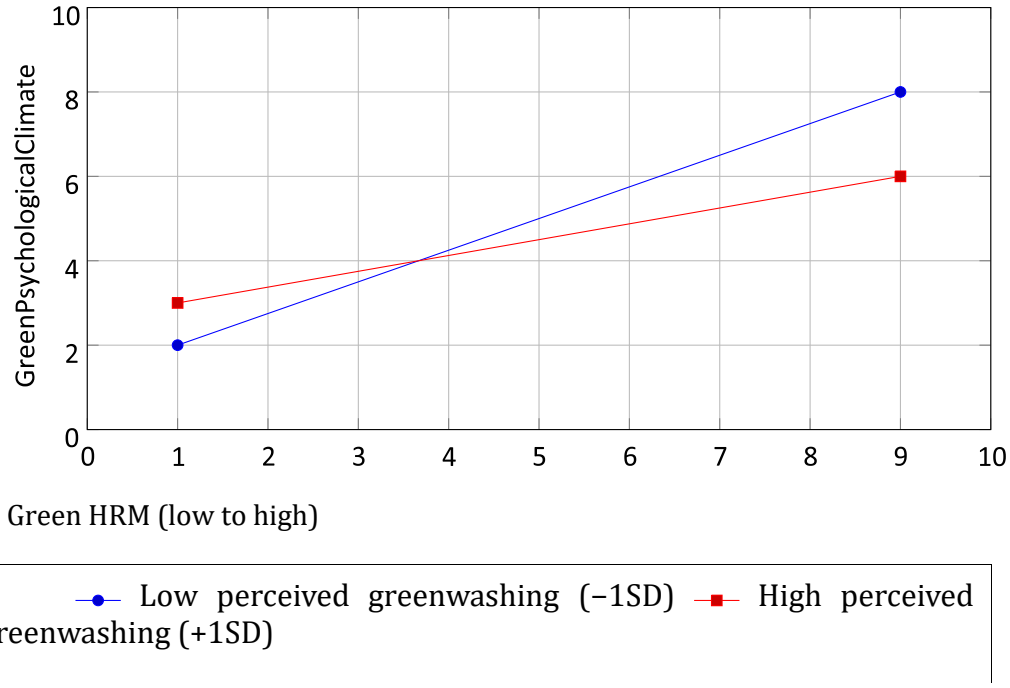

Figure 2: Interaction of perceived greenwashing on the relationship between GHRM and green psychological climate.

Discussion

This study advances understanding of employee-level sustainability in Pakistan's commercial banking sector by explicating how a coherent bundle of green human resource management practices relates to employee green behaviour through green psychological climate, and by identifying perceived green washing as a critical credibility-based boundary condition. The results indicate that GHRM is positively associated with green psychological climate, which in turn predicts both in-role and extra-role green behaviours. This pattern supports the view that HR systems shape behaviour not only through formal incentives and skill development, but also by shaping employees shared perceptions about organizational priorities and expectations. In line with climate theory, green psychological climate appears to function as a proximal interpretive mechanism: when employees perceive that environmental sustainability is valued and supported, they are more likely to incorporate environmental considerations into routine service work and to engage in discretionary pro-

environmental contributions (Norton et al., 2014, 2017). In line with the previous GHRM studies, the mediation outcome demonstrates that the consistency of the green Hr practices into a unitary climate, which gives sense and normative direction of action, enhances the behavioural relevance of the practices as a whole concept (Dumont et al., 2017; Sabokro et al., 2021).

One of the key contributions of the study is the moderating contribution of perceived greenwashing. The result of the negative relationship between GHRM and perceived greenwashing in forecasting the green psychological climate indicates that the efficacy of GHRM will be determined by the credibility judgment of employees. In the event of employees who experience greenwashing, the green HR practices turn less diagnostic of true organizational commitment and thus less apt to be incorporated as a consistent climate. This observation is consistent with the greenwashing literature that highlights that exaggerated or symbolic environmental statement may prompt scepticism and legitimacy questions, reducing stakeholder credibility and weakening the effectiveness of sustainability efforts in persuasion efforts (Delmas and Burbano, 2011; Seele and Gatti, 2017).

Recommendations

Banks need to support the credibility of green initiatives by integrating sustainability communication with substantive HR practices. top Management should institutionalise the environmental dimension in recruitment, training appraisals and rewards, such that employees see real activity rather than symbolic communication. Both frequent internal audits and transparent reporting can be positive tools to mitigate against greenwashing, and to build trust. Leaders need to visibly demonstrate green behaviors and engage employees in the environmental decisions-making process, thus anchoring a collective green psychological climate. Policy makers and regulators can facilitate these efforts by promoting standardized disclosure and verification tools.

References

Babu, N., De Roeck, K., & Raineri, N. (2020). Hypocritical organizations: Implications for employee social responsibility. *Journal of Business Research*, 114:376–384.

Bansal, P. & Clelland, I. (2004). Talking trash: Legitimacy, impression management, and unsystematic risk. *Strategic Management Journal*, 25(1), 93–109.

Boiral, O. & Paille, P. (2012). Organizational citizenship behaviour for the environment: Measurement´ and validation. *Journal of Business Ethics*, 109(4), 431–445.

Bowen, F. & Aragon-Correa, J. A. (2014). Greenwashing in corporate environmentalism research and practice. *Business Strategy and the Environment*, 23(2), 107–112.

Chaudhary, R. (2020). Green human resource management and employee green behaviour: An empirical analysis. *Corporate Social Responsibility and Environmental Management*, 27(2), 630–641.

Christmann, P. & Taylor, G. (2006). Firm self-regulation through international certifiable standards. *Academy of Management Journal*, 49(5), 863–878.

Coen, D., Herman, K., a & Pegram, T. (2022). Are corporate climate efforts genuine? an empirical analysis of the climate 'talk–walk' hypothesis. *Business Strategy and the Environment*, 31(7), 3040–3059.

Crilly, D. (2012). Predicting stakeholder orientation in the multinational enterprise. *Academy of Management Review*, 36(4), 694–716.

Cropanzano, R. & Mitchell, M. S. (2005). Social exchange theory: An interdisciplinary review. *Journal of Management*, 31(6), 874–900.

Delmas, M. A. & Burbano, V. C. (2011). The drivers of greenwashing. *California Management Review*, 54(1), 64–87.

Dumont, J., Shen, J., & Deng, X. (2017). Effects of green HRM practices on employee workplace green behaviour: The role of psychological green climate and employee green values. *Human Resource Management*, 56(4), 613–627.

Gatti, L., Pizzetti, M.,& Seele, P. (2021). Green lies and their effect on intention to invest. *Journal of Business Research*, 127:228–240.

Gond, J.-P., Piani, V., Yoo, E., & Bansal, P. (2017). How do firms legitimize sustainability? the role of symbolic and substantive actions. *Academy of Management Journal*, 60(2), 673–701.

Hair, J. F., Risher, J. J., Sarstedt, M., and Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review*, 31(1), 2–24.

Heras-Saizarbitoria, I., Boiral, O., Allur, E., & Garc´ıa, M. (2020). Communicating environmental management certification: Signaling without signals? *Business Strategy and the Environment*, 29(2), 422– 431.

Katria, S., Bhutto, N. A., Butt, F., Domki, A. A., Khawaja, H. A., & Khalid, J. (2011). Is there any tradeoff between inflation and unemployment? the case of saarc countries. *Pakistan Journal of ccommerce and Social science*, 8:867–86.

Khan, M. H. & Muktar, S. N. (2024). Green employee empowerment: The missing linchpin between green HRM and sustainable organizational performance. *Journal of Cleaner Production*, 434:139812.

Khawaja, H. A. & Ahmed, M. (2021). Work engagement during pandemic: Is organizational trust still relevant? *Annals of Contemporary Developments in Management & HR (ACDMHR)*, 3(2), 1–10.

Khawaja, H. A., Bhutto, N. A., Butt, F., & Abbas, G. (2011). Effective working capital management affects profitability: evidence from asia. In *3rd SAICON: International Conference on Management, Business Ethics and Economics (ICMBEE)*, pages 28–29.

Kim, E.-H. & Lyon, T. P. (2015). Greenwash vs. brownwash: Exaggeration and undue modesty in corporate sustainability disclosure. *Journal of Business Ethics*, 130(2), 307–324.

Lauriano, L. A., Reinecke, J., & Etter, M. (2022). When aspirational talk backfires: The role of moral judgements in employees' hypocrisy interpretation. *Journal of Business Ethics*, 181(4), 827–845.

Norton, T. A., Zacher, H., & Ashkanasy, N. M. (2014). Organisational sustainability policies and employee green behaviour: The mediating role of work climate perceptions. *Journal of Environmental Psychology*, 38:49–54.

Norton, T. A., Zacher, H., & Ashkanasy, N. M. (2017). Bridging the gap between green behavioural intentions and employee green behaviour: The role of green psychological climate. *Journal of Organizational Behaviour*, 38(7), 996–1015.

Onkila, T. (2015). Pride or embarrassment? employees' emotions and corporate environmental performance. *Organization & Environment*, 28(2), 222–241.

Paille, P. and Mejia-Morelos, J. H. (2019). Organisational support is not always enough to encourage´ employee environmental performance. the moderating role of exchange ideology. *Journal of Cleaner Production*, 220:1061–1070.

Paille, P., Val´ eau, P., and Renwick, D. W. (2020). Leveraging green human resource practices to achieve´ environmental sustainability. *Journal of Cleaner Production*, 260:121137.

Pfeffer, J. (2010). Building sustainable organizations: The human factor. *Academy of Management Perspectives*, 24(1), 34–45.

Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioural research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, 88(5), 879–903.

Ramus, C. A. and Steger, U. (2000). The roles of supervisory support behaviours and environmental policy in employee ecoinitiatives. *Academy of Management Journal*, 43(4), 605–626.

Renwick, D. W. S., Redman, T., & Maguire, S. (2013). Green human resource management: A review and research agenda. *International Journal of Management Reviews*, 15(1), 1–14.

Robertson, J. L. and Barling, J. (2013). Greening organizations through leaders' influence on employees' pro-environmental behaviours. *Journal of Organizational Behaviour*, 34(2), 176–194.

Robertson, J. L., Montgomery, A. W., & Ozbilir, T. (2023). Employees' response to corporate greenwashing. *Business Strategy and the Environment*, 32(7), 4015–4027.

Sabokro, M., Masud, M. M., & Kayedian, A. (2021). The effect of green human resources management on corporate social responsibility, green psychological climate and employees' green behaviour. *Journal of Cleaner Production*, 313:127963.

Saeed, B. B., Afsar, B., Hafeez, S., Khan, I., Tahir, M., and Afridi, M. A. (2019). Promoting employee's proenvironmental behaviour through green human resource management practices. *Corporate Social Responsibility and Environmental Management*, 26(2), 424–438.

Seele, P. and Gatti, L. (2017). Greenwashing revisited: In search of a typology and accusation-based definition incorporating legitimacy strategies. *Business Strategy and the Environment*, 26(2), 239–252.

Spence, M. (1973). Job market signaling. *The Quarterly Journal of Economics*, 87(3), 355–374.

Tang, G., Chen, Y., Jiang, Y., Paille, P., & Jia, J. (2018). Green human resource management practices:´ Scale development and validity. *Asia Pacific Journal of Human Resources*, 56(1), 31–55.

Testa, F., Gusmerotti, N., Corsini, F., Passetti, E., & Iraldo, F. (2020). Factors affecting environmental management by employees: A greenwashing perspective. *Journal of Cleaner Production*, 246:118987.

Tian, Q. and Robertson, J. L. (2019). How and when does perceived CSR affect employees' engagement in voluntary pro-environmental behaviour? *Journal of Business Ethics*, 155(2), 399–412.

Walker, K. and Wan, F. (2012). The harm of symbolic actions and green-washing: Corporate actions and communications on environmental performance and their financial implications. *Journal of Business Ethics*, 109(2), 227–242.

Yu, W., Chavez, R., Feng, M., Wong, C. Y., and Fynes, B. (2020). Green human resource management and environmental cooperation: An ability-motivation-opportunity and contingency perspective. *International Journal of Production Economics*, 219:224–235.