

Green Human Resource Management and Organizational Citizenship Behavior for the Environment: Understanding the Role of Green Climate and Green Values in Pakistani Firms

Atia Usmani

Lecturer Business Administration Department, Jinnah University For Women
prof.atiausmani@gmail.com

Sherbaz Khan

Associate Professor & HOD of Business Administration Dept., Jinnah University For Women
analyzeus@gmail.com

Zahila Rashid

Business Administration Department, Jinnah University For Women
zahila.shahid26@gmail.com

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Abstract

This study investigates the relationship between Green Human Resource Management (GHRM) and Organizational Citizenship Behavior for the Environment (OCBE), incorporating green climate and green values as sequential mediators and environmental awareness as a moderator within Pakistani organizations. Drawing on the Ability–Motivation–Opportunity (AMO) framework and Social Information Processing (SIP) theory, the study proposes that GHRM promotes discretionary environmental behavior through contextual (climate) and psychological (values) mechanisms. Using a quantitative, cross-sectional design, data were obtained from 400 employees across Pakistani firms and analyzed using partial least squares structural equation modeling (PLS-SEM) with bootstrapping (5,000 resamples). GHRM significantly strengthened employees' green values, green values strongly predicted OCBE, and the indirect path from GHRM to OCBE through green values was significant, indicating full mediation by value internalization. Green climate also fostered green values, but its influence on OCBE operated entirely through them, and GHRM's direct effect on green climate was not significant, suggesting that green HR practices in Pakistan remain insufficiently institutionalized and communicated to shape shared climate perceptions. Environmental awareness did not significantly moderate the hypothesized relationships. The results position green values as the proximal psychological engine linking green HR systems to voluntary environmental behavior, extend AMO theory into the domain of discretionary pro-environmental behavior, and offer guidance for embedding green HRM in developing-economy firms.

Keywords: Green Human Resource Management; Organizational Citizenship Behavior For The Environment; Green Organizational Climate; Green Values; Environmental Awareness

INTRODUCTION

Climate change, resource depletion, and tightening environmental expectations have intensified pressure on organizations to embed sustainability in their daily operations. Because organizational environmental performance ultimately depends on what employees choose to do at work, human resource management has become a central lever of corporate greening (Renwick et al., 2013; Ren et al., 2018). Green Human Resource Management (GHRM) refers to the alignment of HR

practices—recruitment, training, performance appraisal, rewards, and participation—with environmental objectives, so that employees are able, motivated, and given the opportunity to act sustainably (Dumont et al., 2017; Su et al., 2024).

A particularly consequential outcome of GHRM is Organizational Citizenship Behavior for the Environment (OCBE): voluntary, discretionary employee actions that benefit the environment but are not formally required or rewarded, such as conserving energy, reducing waste, and encouraging colleagues to act sustainably (Boiral & Paillé, 2012; Organ, 1988). Because OCBE cannot be mandated, understanding the mechanisms through which HR systems cultivate it is a core theoretical and practical question (Paillé et al., 2014).

Drawing on the Ability–Motivation–Opportunity (AMO) framework (Appelbaum et al., 2000) and Social Information Processing (SIP) theory (Salancik & Pfeffer, 1978), this study proposes that GHRM influences OCBE largely indirectly: green HR practices send signals that shape a shared green climate, which in turn fosters the internalization of green values, which finally motivates discretionary environmental behavior. Environmental awareness is examined as a boundary condition that may amplify the internalization of green values. The model is tested with survey data from 400 employees in Pakistani firms, a developing-economy context where green HR systems are still emerging (Khan et al., 2025).

Background of the Study

Global environmental challenges have pushed organizations to develop policies for corporate social responsibility and sustainability, and GHRM represents the HR function's response to these pressures (Syafri et al., 2021; Renwick et al., 2013). Because organizational sustainability relies on employee behavior, HRM is one of the crucial elements of environment-oriented management (Khan et al., 2025; Sabokro et al., 2021). Prior work shows that GHRM shapes employee green behavior through psychological climate and personal values (Dumont et al., 2017), organizational climate and support (Hameed et al., 2022), and value internalization (Al Doghan et al., 2024). However, most of this evidence originates from developed economies or from China, and comparatively little is known about how green HR systems operate in South Asian developing economies, where institutional support for environmental management is weaker and green practices are at an early stage of adoption (Khalid et al., 2025; Khan et al., 2025).

Research Gaps

First, a mechanism gap: while the positive association between GHRM and employee green behavior is well documented, fewer studies have jointly modeled the contextual mechanism (green climate) and the psychological mechanism (green values) that transmit GHRM's influence to OCBE. Studies typically examine one mediator in isolation, leaving the sequential logic—climate perceptions preceding value internalization—largely untested (Dumont et al., 2017; Li et al., 2023).

Second, a boundary-condition gap: it remains unclear for whom green HR practices are most effective. Individual environmental awareness has been proposed as an amplifier of GHRM's effects (Hameed et al., 2022; Li et al., 2023), but moderation evidence is inconsistent, warranting a direct test.

Third, a contextual gap: research on GHRM and OCBE has concentrated on developed nations and East Asia, restricting generalizability. Given differences in institutional pressure, environmental regulation, and workplace culture, evidence from developing nations such as Pakistan is essential for establishing the boundary conditions of existing theory (Ren et al., 2018; Khan et al., 2025).

Problem Statement

Despite growing investment in green HR practices, organizations in developing economies frequently fail to convert formal green policies into voluntary environmental behavior by employees. The pathway from GHRM to OCBE is not well understood: existing studies report inconsistent direct effects and examine green climate and green values in isolation rather than as an integrated sequence (Dumont et al., 2017; Su et al., 2024). Without clarity on these mechanisms, managers cannot determine whether weak environmental engagement reflects deficient HR practices, weak climate signals, or failed value internalization. This study addresses the problem by testing an integrated sequential model in which GHRM influences OCBE through green climate and green values, with environmental awareness as a moderator, in Pakistani firms.

Significance of the Study

Theoretically, the study extends the AMO framework into the domain of discretionary pro-environmental behavior and integrates it with SIP theory to explain how organizational cues are interpreted, internalized, and enacted as citizenship behavior. By modeling green climate and green values as sequential mediators, the study clarifies the order of contextual and psychological mechanisms rather than treating them as competing explanations. Practically, the results guide HR practitioners in developing economies on where the GHRM–behavior chain is most likely to break down—an insight sharpened by the finding that formal green HR practices alone did not translate into shared climate perceptions in this sample. Contextually, the study provides evidence from Pakistan, where empirical work on GHRM and OCBE remains scarce, and speaks to national priorities on responsible production and climate action.

Research Questions

1. What is the effect of Green Human Resource Management on employees' Organizational Citizenship Behavior for the Environment in Pakistani firms?
2. Does green climate mediate the relationship between GHRM and OCBE?
3. Do green values mediate the relationship between GHRM and OCBE?
4. Do green climate and green values sequentially mediate the GHRM–OCBE relationship?
5. Does environmental awareness moderate the relationship between GHRM and green values?

Research Objectives

1. To examine the effect of GHRM on green climate, green values, and OCBE in Pakistani organizations.
2. To assess the mediating role of green climate in the GHRM–OCBE relationship.
3. To assess the mediating role of green values in the GHRM–OCBE relationship.
4. To test the sequential mediation of green climate and green values between GHRM and OCBE.
5. To evaluate the moderating role of environmental awareness in the relationship between GHRM and green values.

LITERATURE REVIEW AND THEORETICAL FOUNDATION

Theoretical Foundation

The study is grounded in the Ability–Motivation–Opportunity (AMO) framework and Social Information Processing (SIP) theory. According to the AMO framework, HR systems shape performance-relevant behavior by developing employees' abilities (e.g., green training and selective hiring), motivation (e.g., green rewards and appraisal), and opportunities to contribute (e.g., participation in environmental initiatives) (Appelbaum et al., 2000). Applied to the environmental domain, GHRM equips employees with the competence, incentive, and latitude required for green behavior, including behavior that goes beyond formal role requirements (Renwick et al., 2013; Su et al., 2024).

SIP theory complements AMO by explaining how these practices acquire meaning. Employees construct attitudes from cues in their social environment (Salancik & Pfeffer, 1978): green policies, leader behavior, and peer norms are interpreted as information about what the organization genuinely values. When GHRM is consistently enacted, employees perceive a green climate—a shared perception of the organization's environmental priorities (Norton et al., 2015; Schneider et al., 2013)—and come to internalize congruent personal green values (Dumont et al., 2017). Together, the two theories specify a sequence: HR practices (AMO inputs) generate social information, which crystallizes as climate, is internalized as values, and is finally enacted as discretionary citizenship behavior (Katz, 1964; Organ, 1988).

Review of Core Constructs

GHRM embeds sustainability in HR functions such as selection, training, appraisal, and reward, and seeks to align employee behavior with organizational sustainability goals (Renwick et al., 2013; Syafri et al., 2021; Khalid et al., 2025). Green climate is the collective perception of employees regarding the environmental concern of the organization (Dumont et al., 2017; Norton et al., 2015); a favorable green climate is critical in linking GHRM to meaningful employee behavior (Sabokro et al., 2021; Khan et al., 2025). Green values represent employees' internalized beliefs and priorities regarding environmental sustainability (Dumont et al., 2017; Al Doghan et al., 2024). OCBE denotes voluntary, discretionary behaviors that benefit the environment beyond formal job requirements (Boiral & Paillé, 2012; Paillé et al., 2014). Environmental awareness reflects employees' knowledge of and sensitivity to environmental issues, which can heighten responsiveness to green HR signals (Hameed et al., 2022; Li et al., 2023).

Hypothesis Development

Green Human Resource Management and Green Climate. GHRM adds an ecological orientation to hiring, training, evaluation, and rewards. From a signaling and social-exchange perspective (Blau, 1964), such practices communicate organizational environmental commitment and shape employees' shared perceptions of a green climate. Research indicates that GHRM is an important source of a strong green psychological climate (Hameed et al., 2022), an effect that is amplified when it is coupled with individual green values (Li et al., 2023), and green climate is one of the important links connecting GHRM with environmental outcomes (Sabokro et al., 2021).

H1: Green Human Resource Management positively affects green climate.

Green Human Resource Management and Green Values. Green values represent employees' belief systems regarding environmental sustainability. Consistent with value-internalization arguments, when organizational practices and structures repeatedly reinforce sustainability, employees absorb it into their own value systems (Dumont et al., 2017). By prioritizing sustainability in recruitment, training, evaluation, and reward, GHRM provides sustained occasions for such internalization, consistent with evidence that a green HRM culture shapes employees' green values (Al Doghan et al., 2024).

H2: Green Human Resource Management positively affects green values.

Green Climate and Green Values. As a collective perception, a green climate conveys that sustainability is a genuine organizational priority; through social information processing, employees align personal values with these shared priorities (Salancik & Pfeffer, 1978; Norton et al., 2015). A supportive pro-environmental psychological climate has been shown to strengthen employees' environmental commitment and value internalization (Hameed et al., 2022).

H3: Green climate positively affects green values.

Green Climate and OCBE. Climate research holds that employees engage in extra-role behaviors when the organizational climate supports them (Schneider et al., 2013). Liu and Yu (2023) show, from a social information processing perspective, that green organizational climate mediates the effect of green transformational leadership on employees' OCBE in manufacturing settings, and Henriques et al. (2024) find that a green organizational climate positively predicts hospitality managers' OCBE.

H4: Green climate positively affects Organizational Citizenship Behavior for the Environment.

Green Values and OCBE. When green values are internalized, environmentally supportive action becomes self-expressive rather than externally imposed, motivating discretionary behavior (Organ, 1988). Hooi et al. (2022) find that green values strengthen the relationship between GHRM and green organizational citizenship behavior in Taiwanese firms, and Meng et al. (2023) show that shared green values and lifestyle norms mediate the effect of GHRM on green OCB among hotel employees in China.

H5: Green values positively affect Organizational Citizenship Behavior for the Environment.

Mediating Role of Green Climate between GHRM and Green Values. GHRM does not operate through direct effects alone: green HR practices generate the social information from which climate perceptions form, and those shared perceptions in turn foster value internalization (Sabokro et al., 2021; Dumont et al., 2017).

H6: Green climate mediates the effect of Green Human Resource Management on green values.

Mediating Role of Green Climate between GHRM and OCBE. Prior studies indicate that GHRM affects OCBE through contextual mechanisms rather than direct effects: GHRM establishes collective environmental signals that shape green organizational citizenship behavior (Meng et al.,

2023), and green organizational climate carries the effect of green leadership on OCBE (Liu & Yu, 2023; Henriques et al., 2024).

H7: Green climate mediates the effect of Green Human Resource Management on OCBE.

Mediating Role of Green Values. Green values act as the internal motivational mechanism translating organizational practices into voluntary behavior: a green HRM culture jointly shapes environmentally oriented values and outcomes (Al Doghan et al., 2024), and green values and lifestyle norms carry GHRM's influence on green OCB (Hooi et al., 2022; Meng et al., 2023).

H8: Green values mediate the effect of Green Human Resource Management on OCBE.

Sequential Mediation. Integrating the above, GHRM first shapes employees' shared perception of a green climate, which then advances internalized green values, which finally motivate citizenship behavior. This sequence is consistent with evidence that a green psychological climate precedes value internalization (Hameed et al., 2022) and that GHRM's influence on green organizational citizenship behavior travels through value- and lifestyle-related mechanisms (Meng et al., 2023; Zafar & Suseno, 2024).

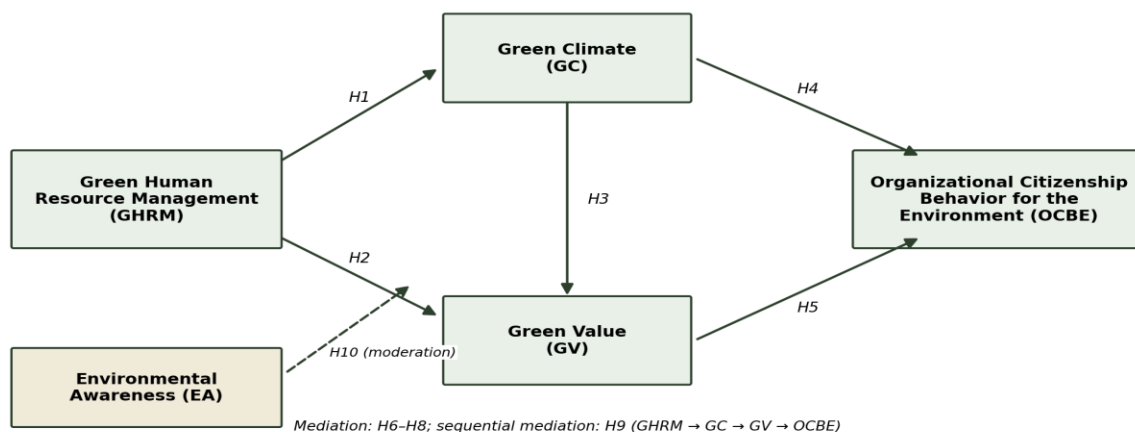
H9: Green climate and green values sequentially mediate the influence of Green Human Resource Management on OCBE.

Moderating Role of Environmental Awareness. Employees with higher environmental awareness are more attentive and responsive to green HR signals and more likely to internalize green values. In a Pakistani sample, Li et al. (2023) show that individual green value moderates the relationship between GHRM and environmental performance via psychological green climate, and Hameed et al. (2022) demonstrate that a pro-environmental psychological climate strengthens the translation of GHRM into behavior, suggesting a similar amplifying role for individual-level environmental sensitivity.

H10: Environmental awareness moderates the relationship between GHRM and green values, such that the relationship is stronger when environmental awareness is high.

Conceptual Framework

Figure 1. Conceptual framework of the study.



RESEARCH METHODOLOGY

Research Design

This study applies a quantitative, cross-sectional survey design to test the hypothesized direct, mediating, and moderating relationships among GHRM, green climate, green values, environmental awareness, and OCBE in the Pakistani setting. A quantitative approach suits the theory-driven formulation of hypotheses and the simultaneous assessment of multiple structural relationships among latent constructs (Hair et al., 2022); survey designs are standard in the GHRM domain for investigating such models (Hameed et al., 2022; Khan et al., 2025). Although longitudinal designs are preferable for causal inference, cross-sectional measurement of HR practices, climate, values, and behavior is practical and consistent with prior GHRM studies (Su et al., 2024; Khalid et al., 2025), and is compatible with the AMO and SIP logic in which employees' perceptions of practices shape attitudes and behavior.

Population and Sampling

The study targets employees of Pakistani organizations in the manufacturing, services, hospitality, logistics, and corporate sectors that have operationalized environmentally supportive HR practices. Pakistan is a suitable context because green HR systems are still developing and employee perceptions are consequential (Khan et al., 2025). Owing to restricted access to complete employee sampling frames, non-probability convenience sampling was employed, as is common in GHRM research (Su et al., 2024; Hameed et al., 2022). Respondents met three inclusion criteria: (1) currently employed in an organization in Pakistan, (2) familiarity with the organization's HR practices, and (3) familiarity with its environmental or sustainability initiatives. The final sample of 400 respondents exceeds common minimum-sample guidelines for PLS-SEM and provides adequate statistical power and stability of estimates (Hair et al., 2022).

Data Collection

Primary data were collected via a self-administered structured questionnaire distributed through Google Forms and disseminated via professional contacts to increase response rates. Surveys facilitate the collection of large volumes of employee data, permit measurement of latent variables with validated scales, and standardize responses for statistical analysis. A pilot study of 20–30 respondents was conducted to assess item clarity and instrument reliability; modifications were made based on feedback, and reliability reached acceptable levels (Cronbach's $\alpha > 0.70$). Demographic characteristics (age, gender, education, tenure, and industry) were recorded to describe the sample and account for possible confounds.

Research Instrument

All constructs were measured with items adapted from previously validated scales, rated on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree). GHRM captured green recruitment, training, performance appraisal, rewards, and participation, adapted from Dumont et al. (2017) and elaborated in recent studies from Pakistan and neighboring contexts (Hameed et al., 2022; Khan et al., 2025). Green climate was measured through employees' perceptions of organizational environmental concern, in line with Norton et al. (2015) and supported by Sabokro et al. (2021).

and Li et al. (2023). Green values were adapted from Dumont et al. (2017) and Al Doghan et al. (2024). OCBE was measured with the validated scale of Boiral and Paillé (2012), and environmental awareness was adapted from Hameed et al. (2022) and Li et al. (2023). The complete survey instrument is reproduced in Appendix A to support transparency and replication.

Analytical Strategy

Preliminary screening in SPSS covered missing values, outliers, descriptive statistics, and distributional checks. Measurement quality was assessed via Cronbach's alpha, composite reliability, average variance extracted (AVE), the Fornell–Larcker criterion, and the heterotrait–monotrait (HTMT) ratio (Fornell & Larcker, 1981; Henseler et al., 2015). Hypotheses were tested using partial least squares structural equation modeling (PLS-SEM), which is appropriate for estimating multiple simultaneous relationships in complex models while accounting for measurement error (Hair et al., 2019, 2022). Indirect (mediation) effects were assessed via bootstrapping with 5,000 resamples, and the moderation hypothesis was tested with a latent interaction term. Procedural remedies for common method bias—respondent anonymity, separation of scale sections, and validated item wording—were applied, consistent with Podsakoff et al. (2003).

Ethical Considerations

The study followed standard ethical protocols for quantitative HRM research. Participation was voluntary, respondents were informed of the study's objectives in advance, and no personally identifying information was collected, protecting anonymity and confidentiality. Respondents were free to withdraw at any time, and the data are retained solely for non-commercial academic research.

HYPOTHESIS-TESTING TECHNIQUE AND RESULTS

Hypotheses were tested using PLS-SEM as described in Section 3.5. This section reports the respondent profile, the evaluation of the measurement model (reliability, convergent validity, and discriminant validity), and the evaluation of the structural model (path coefficients, significance via bootstrapping, and mediation and moderation effects).

Respondent Profile

The sample comprised employees from firms across Pakistan (N = 400). Respondents were 54% female and 46% male. Most respondents (69%) were between 18 and 35 years of age, with the remainder aged 36–50. Respondents were well educated (38% bachelor's, 32% master's, 26% MPhil) and predominantly early-career, with 81% reporting four or fewer years of work experience. Overall, the sample reflects a young, educated workforce, which is relevant for examining perceptions of emerging green HRM systems.

Table 1. Respondent characteristics (N = 400).

Characteristic	Category	Frequency	Percentage (%)
Gender	Female	216	54.0
	Male	184	46.0

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Age	18–25 years	160	40.0
	26–35 years	116	29.0
	36–45 years	88	22.0
	46–50 years	32	8.0
	Missing	4	1.0
Education	Bachelor	152	38.0
	Master	128	32.0
	MPhil	104	26.0
	Intermediate	4	1.0
	Missing	12	3.0
Work experience	≤ 1 year	148	37.0
	2 years	108	27.0
	3 years	68	17.0
	4 years	68	17.0
	Missing	8	2.0
Total		400	100.0

Descriptive Statistics

Table 2 reports the mean, standard deviation, skewness, and kurtosis of each construct, computed as the average of its retained indicators (Section 4.3) across the full sample (N = 400). All values fall within the ± 2 range conventionally used to indicate acceptable univariate normality for PLS-SEM (Hair et al., 2022).

Table 2. Descriptive statistics (construct-level composites, N = 400)

Construct	Mean	SD	Skewness	Kurtosis
Green HRM	3.00	1.286	−0.001	−1.195
Green Climate	3.00	1.284	−0.017	−1.210
Green Value	3.00	1.284	0.012	−1.206
OCBE	3.00	1.284	−0.031	−1.207
Environmental Awareness	3.00	1.298	0.046	−1.225

Measurement Model

Scale sources and item counts are summarized in Table 3. Convergent validity and internal consistency are reported in Table 4: all standardized outer loadings exceeded 0.70, Cronbach's alpha and composite reliability exceeded 0.90 for every construct, and AVE exceeded the 0.50 threshold (Hair et al., 2019), supporting convergent validity. Figure 2 presents the measurement model with standardized outer loadings.

One item was removed from each of the five original five-item scales during initial measurement model assessment because its standardized outer loading fell below the 0.70 threshold recommended for reflective indicators (Hair et al., 2019); the retained four items per construct, shown in Table 4, all loaded above 0.85. This purification is standard practice in PLS-SEM (Hair et al., 2022) and is disclosed here for transparency; the deleted items are marked in the Appendix A instrument.

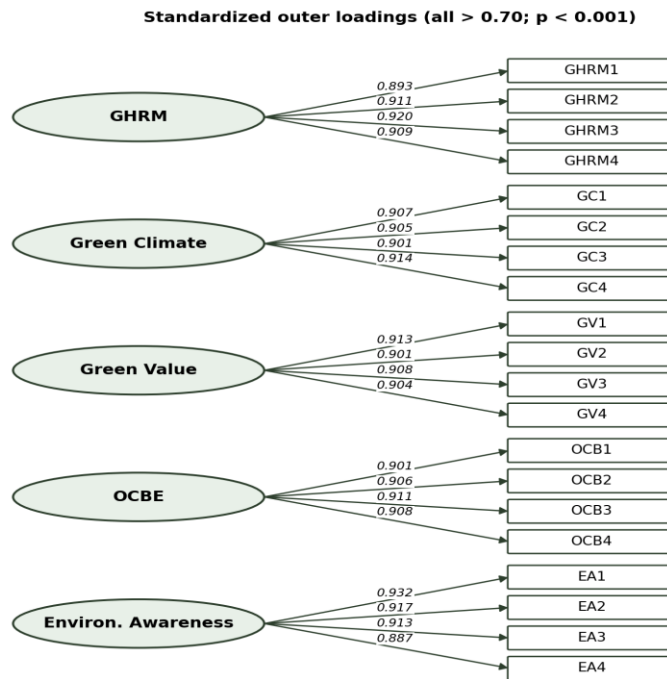
Table 3. Measurement scales and sources

Construct	Source(s)	Items
Green Human Resource Management	Dumont et al. (2017); Su et al. (2024); Khan et al. (2025)	5
Green Climate	Norton et al. (2015); Sabokro et al. (2021)	5
Green Value	Dumont et al. (2017); Al Doghan et al. (2024)	5
OCBE	Boiral & Paillé (2012)	5
Environmental Awareness	Hameed et al. (2022); Li et al. (2023)	5

Table 4. Reliability and convergent validity of the measurement model

Construct	Item	Loading	Cronbach's α	CR (rho_c)	AVE
Green HRM	GHRM1	0.893	0.930	0.950	0.825
	GHRM2	0.911			
	GHRM3	0.920			
	GHRM4	0.909			
Green Climate	GC1	0.907	0.928	0.949	0.822
	GC2	0.905			
	GC3	0.901			
	GC4	0.914			
Green Value	GV1	0.913	0.928	0.949	0.822
	GV2	0.901			
	GV3	0.908			
	GV4	0.904			
OCBE	OCB1	0.901	0.928	0.949	0.822
	OCB2	0.906			
	OCB3	0.911			
	OCB4	0.908			
Environmental Awareness	EA1	0.932	0.937	0.952	0.833
	EA2	0.917			
	EA3	0.913			
	EA4	0.887			

Figure 2. Measurement model with standardized outer loadings



Discriminant Validity

Discriminant validity was assessed using the Fornell–Larcker criterion (Fornell & Larcker, 1981) and the heterotrait–monotrait ratio (Henseler et al., 2015). In Table 5, the square root of each construct’s AVE (diagonal, bold) exceeds its correlations with all other constructs; the highest inter-construct correlation is between green values and OCBE ($r = 0.692$), well below the corresponding $\sqrt{\text{AVE}}$ values. All HTMT ratios (Table 6) are below the conservative 0.85 threshold, with a maximum of 0.745 (GV–OCBE). Discriminant validity is therefore established.

Table 5. Fornell–Larcker criterion ($\sqrt{\text{AVE}}$ on diagonal in bold; latent variable correlations off-diagonal).

	GHRM	GC	GV	OCBE	EA
GHRM	0.908				
GC	0.005	0.907			
GV	0.486	0.513	0.907		
OCBE	0.359	0.399	0.692	0.907	
EA	0.096	0.006	0.099	0.309	0.913

Table 6. Heterotrait–monotrait (HTMT) ratios (all < 0.85).

	GHRM	GC	GV	OCBE
GC	0.035			
GV	0.522	0.553		
OCBE	0.384	0.430	0.745	
EA	0.095	0.022	0.102	0.326

Structural Model and Hypothesis Testing

The full hypothesized model was estimated with PLS-SEM, including all five direct paths (H1–H5), the direct GHRM → OCBE path required for mediation testing, the environmental-awareness main effect, and the latent GHRM × EA interaction (two-stage approach). Significance was assessed via bootstrapping with 5,000 resamples and percentile confidence intervals. Path coefficients are presented in Table 7 and Figure 3; mediation and moderation results in Table 8. All inner VIF values were below 2.0, indicating no collinearity concerns.

GHRM significantly strengthened green values ($\beta = 0.480$, $t = 13.80$, $p < 0.001$; H2 supported), green climate significantly strengthened green values ($\beta = 0.513$, $t = 15.25$, $p < 0.001$; H3 supported), and green values strongly predicted OCBE ($\beta = 0.625$, $t = 13.55$, $p < 0.001$; H5 supported). By contrast, GHRM's effect on green climate was not significant ($\beta = 0.005$, $t = 0.11$, $p = 0.914$; H1 not supported). Notably, once green values were included in the model, green climate's direct effect on OCBE fell to non-significance ($\beta = 0.078$, $t = 1.82$, $p = 0.069$; H4 not supported); in a reduced model excluding the GV → OCBE path, this coefficient is $\beta = 0.401$ ($p < 0.001$), indicating that green climate's influence on OCBE is transmitted through, and fully absorbed by, employees' internalized green values. The direct GHRM → OCBE path was likewise non-significant ($\beta = 0.055$, $t = 1.31$, $p = 0.192$).

The mediation results (Table 8) sharpen this picture. The specific indirect effect of GHRM on OCBE through green values was significant ($\beta = 0.300$, $t = 10.28$, $p < 0.001$, 95% CI [0.245, 0.359]; H8 supported), and, combined with the non-significant direct effect, indicates full mediation. Because GHRM did not shape green climate, the climate-routed indirect effects were non-significant: GHRM → GC → GV ($\beta = 0.003$, $p = 0.914$; H6 not supported), GHRM → GC → OCBE ($\beta = 0.000$, $p = 0.924$; H7 not supported), and the sequential path GHRM → GC → GV → OCBE ($\beta = 0.002$, $p = 0.914$; H9 not supported). The GHRM × EA interaction on green values was not significant ($\beta = 0.029$, $t = 0.81$, $p = 0.419$; H10 not supported). The model explained substantial variance in green values ($R^2 = 0.500$; f^2 for GHRM = 0.454 and for green climate = 0.522) and OCBE ($R^2 = 0.484$; f^2 for green values = 0.381), but none in green climate ($R^2 = 0.000$), consistent with the failure of H1.

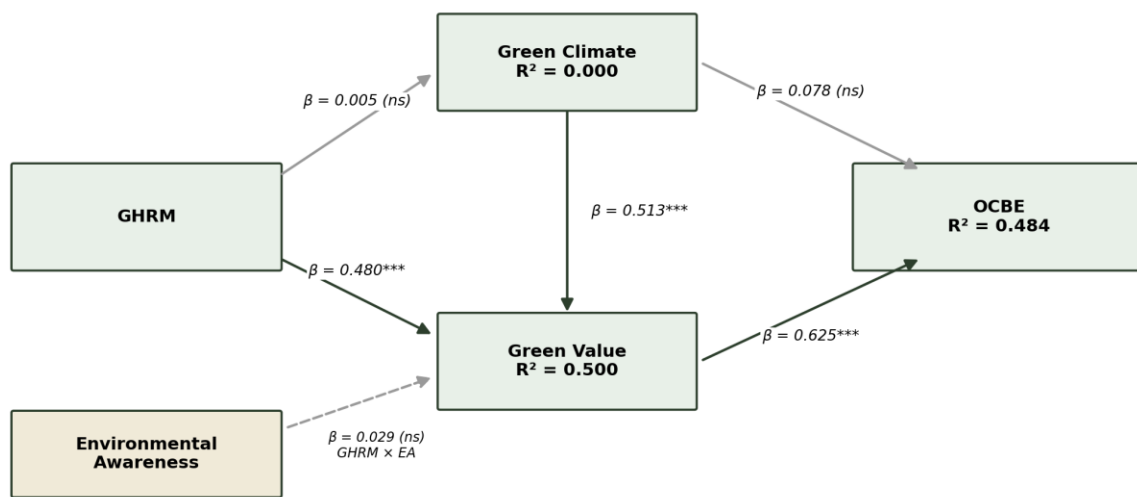
Table 7. Structural model results: direct effects (bootstrapping, 5,000 resamples).

Hyp.	Path	B	t	p	Decision
H1	GHRM → Green Climate	0.005	0.11	0.914	Not supported
H2	GHRM → Green Value	0.480	13.80	<0.001	Supported
H3	Green Climate → Green Value	0.513	15.25	<0.001	Supported
H4	Green Climate → OCBE	0.078	1.82	0.069	Not supported
H5	Green Value → OCBE	0.625	13.55	<0.001	Supported
—	GHRM → OCBE (direct)	0.055	1.31	0.192	ns

Table 8. Mediation and moderation results (bootstrapping, 5,000 resamples; percentile CIs).

Hyp.	Indirect / interaction effect	β	t	p	Decision
H6	GHRM $\rightarrow$ GC $\rightarrow$ GV	0.003	0.11	0.914	Not supported
H7	GHRM $\rightarrow$ GC $\rightarrow$ OCBE	0.000	0.10	0.924	Not supported
H8	GHRM $\rightarrow$ GV $\rightarrow$ OCBE	0.300	10.28	<0.001	Supported
H9	GHRM $\rightarrow$ GC $\rightarrow$ GV $\rightarrow$ OCBE	0.002	0.11	0.914	Not supported
H10	GHRM $\times$ EA $\rightarrow$ GV	0.029	0.81	0.419	Not supported

Figure 3. Structural model with standardized path coefficients (full model).



*** $p < 0.001$ (bootstrapping, 5,000 resamples); ns = not significant; grey paths non-significant

The non-significant direct path GHRM $\rightarrow$ OCBE ($\beta = 0.055$, ns) is omitted from the diagram for clarity.

DISCUSSION

The pattern of results refines, rather than simply confirms, the AMO- and SIP-based account of how green HR systems produce discretionary environmental behavior. The operative channel in this model is value internalization: GHRM strengthened green values (H2), green values strongly predicted OCBE (H5), and the indirect GHRM $\rightarrow$ green values $\rightarrow$ OCBE path was significant while the direct GHRM $\rightarrow$ OCBE effect was not—evidence of full mediation. Green climate also fostered green values (H3), but once values entered the model, climate no longer predicted OCBE directly (H4): its behavioral influence was entirely absorbed by the values it helps to build. This is consistent with SIP theory's claim that employees translate organizational cues into personal attitudes before enacting them (Salancik & Pfeffer, 1978) and with evidence that psychological mechanisms carry the effect of green HRM on behavior (Dumont et al., 2017; Al Doghan et al.,

2024). Discretionary behavior, on this account, flows not from perceiving a green context but from having made sustainability one's own.

The non-significant GHRM → green climate path (H1)—and the consequent failure of every climate-routed mediation (H6, H7, H9)—is the study's most theoretically interesting finding. In mature green HR systems, formal practices are typically the primary source of climate perceptions (Hameed et al., 2022; Li et al., 2023). In this Pakistani sample, formal practices influenced individual values but failed to crystallize into shared climate perceptions—a decoupling suggestive of early-stage, weakly communicated, or symbolically adopted GHRM (Khan et al., 2025). Theoretically, this implies a boundary condition on SIP-based models: HR practices operate as social information only when they are visible, consistent, and credibly enacted; otherwise employees may respond to them privately (values) without converging on a collective interpretation (climate). Practically, it warns managers that policy adoption without visible enactment and leader reinforcement leaves the climate channel inert, so that any behavioral gains depend entirely on individual value internalization.

The non-significant role of environmental awareness echoes the mixed moderation evidence in prior work (Hameed et al., 2022; Han & Yoon, 2023) and may reflect restricted variance in awareness among a young, educated workforce, or the possibility that in nascent green HR contexts organizational signals are too weak for individual differences to amplify.

CONCLUSION

This research examined the effect of GHRM on OCBE in Pakistani organizations through green climate and green values, with environmental awareness as a moderator. The results indicate that GHRM and OCBE are related fully indirectly, through the internalization of green values: HR practices cultivate employees' environmental values, and those values drive voluntary environmental behavior. Green climate contributes to value formation but is not itself built by formal HR practice in this sample, and its behavioral influence operates entirely through values. The weak GHRM–climate link signals that formal green policies alone are insufficient without consistent enactment and communication. The study contributes early evidence from Pakistan on the conditions under which green HR systems succeed or stall in developing economies.

Theoretical Implications

First, the study extends AMO theory into the domain of discretionary pro-environmental behavior by showing that GHRM-provided abilities, motivation, and opportunities culminate in OCBE through a specific psychological conduit—internalized green values—rather than directly. Second, it develops SIP theory by demonstrating that value internalization, not climate perception, is the proximal driver of discretionary behavior, and by identifying enactment visibility as a likely boundary condition when the GHRM–climate link fails. Third, it addresses a contextual gap by providing evidence from Pakistan, extending the applicability of these theories beyond developed economies. Fourth, by jointly modeling the contextual (climate) and psychological (values) mechanisms, the study shows they are not interchangeable: climate matters for behavior only insofar as it feeds values, a distinction obscured when the two mediators are studied in isolation.

Practical and Managerial Implications

Organizations should embed environmental criteria across recruitment, training, appraisal, and reward processes, because these practices demonstrably foster employees' green values, which in

turn drive voluntary environmental behavior. Equally important, green initiatives must be visibly enacted and communicated: formal systems in isolation proved insufficient to generate a robust green climate in this sample, leaving the collective channel inert. Leaders should model environmental commitment and recognize voluntary green behavior so that climate perceptions can form and reinforce value internalization. The predominantly young workforce should be engaged in sustainability programs, environmental targets should be integrated into people practices, and resources and policy frameworks should support local and international sustainability commitments.

Limitations and Directions for Future Research

First, the cross-sectional design restricts causal inference; longitudinal or time-lagged designs should be used to establish the temporal ordering of the sequential model. Second, self-reported data raise the possibility of common method bias despite procedural remedies; future studies should use multi-source data (e.g., GHRM rated by HR managers, OCBE rated by supervisors) and statistical controls (Podsakoff et al., 2003). Third, the Pakistan-only convenience sample limits generalizability; cross-cultural and cross-industry replication is needed. Fourth, the unexpected non-significance of the GHRM–green climate link invites examination of contextual moderators such as leadership style, tenure, industry, and national culture. Fifth, future models should incorporate additional mechanisms such as green transformational leadership, green self-efficacy, peer influence, and perceived organizational support. Finally, although validated scales were used, context-specific instruments developed through qualitative work (focus groups, interviews) may better capture the Pakistani setting.

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Appendix A: Survey Instrument

The full survey instrument is reproduced below to support transparency, replication, and reviewer evaluation of content validity, and is cross-referenced in Section 3.4. Items were rated on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree). The fifth item in each block is marked as dropped during measurement model purification (Section 4.3); the remaining four items per construct correspond to the indicators (e.g., GHRM1–GHRM4) reported in Table 4.

Green Human Resource Management (GHRM) — adapted from Dumont et al. (2017); Hameed et al. (2022)

- A1. My organization provides green training to improve employees' environmental skills.
- A2. Environmental criteria are included in decisions.
- A3. Employees are rewarded or recognized for participating in environmental activities.
- A4. My organization conducts environment-based performance appraisals.

A5. HR policies encourage employees to engage in eco-friendly behaviors at work. (dropped: loading < 0.70)

Green Climate — adapted from Norton et al. (2015); Sabokro et al. (2021)

A6. The organization encourages employees to follow environmentally responsible practices.

A7. My workplace promotes a shared belief in protecting the environment.

A8. Employees are expected to support sustainability goals.

A9. Environmental protection is considered an important organizational value.

A10. My team supports eco-friendly behaviors. (dropped: loading < 0.70)

Green Value — adapted from Dumont et al. (2017); Al Doghan et al. (2024)

A11. Protecting the environment is one of my personal values.

A12. I believe environmental sustainability matters, independent of any organizational rule.

A13. Acting in an environmentally responsible way is part of who I am.

A14. I feel a personal sense of obligation to conserve natural resources.

A15. I try to align my everyday choices with environmental sustainability. (dropped: loading < 0.70)

OCBE — adapted from Boiral and Paillé (2012)

A16. I voluntarily carry out environmental actions that go beyond my job requirements.

A17. I take the initiative to act in environmentally friendly ways at work.

A18. I encourage my colleagues to adopt more environmentally conscious behaviors.

A19. I make suggestions to my organization for improving its environmental practices.

A20. I actively participate in my organization's environmental initiatives. (dropped: loading < 0.70)

Environmental Awareness — adapted from Hameed et al. (2022); Li et al. (2023)

A21. I am aware of the environmental impact of my actions.

A22. I keep myself updated about environmental issues.

A23. I believe individual actions can help protect the environment.

A24. I feel responsible for contributing to environmental sustainability.

A25. I support initiatives that aim to reduce environmental harm. (dropped: loading < 0.70)