

Fostering Sustainable Skies: The Role of Green Human Resource Management in Driving Employee Green Behavior and Corporate Responsibility in Pakistani Airlines

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The urgency of climate change and environmental degradation has placed sustainability at the top of global policy, research, and industry agendas. Of the many routes organizations can take to approach this issue, placing true efficiency in embedding environmental values into recruitment, training, employee engagement, and performance appraisal mechanisms has become an important aspect through Green Human Resource Management (GHRM). In conventional HR models that heavily emphasize productivity and profitability, GHRM develops working forces with ecological objectives by turning employees into conscious collaborators in developing environmental responsibility. The growing immediacy of integrating sustainability in high-impact industries of developing economies inspires this study with a particular focus on the service sector, like airlines in Pakistan. The aviation industry negatively contributes to the global CO₂ emissions, leading to global warming and ozone layer thinning. GHRM practices can be adopted to reduce carbon footprints, support corporate social responsibility (CSR), and promote corporate environmental responsibility (CER). However, much of the existing research on aviation management remains focused on customer loyalty, operational efficiency, and financial performance, leaving a notable gap in research that links human resource strategies to environmental outcomes. Using contemporary literature and other global initiatives, for example, the Paris Agreement, this paper discusses how GHRM can be both strategic and operational in sustaining the transport, hospitality, tourism, and aviation sectors of Pakistan. Further, it also discusses awareness at what level (micro-level or individual level), through employee selection, training, and performance management systems, is attained when these systems are designed or implemented through a green lens. Behavioral change-informing behavior changes to achieve long-term environmental objectives addresses organizational constraints of cost implications of low awareness, and a tendency toward greenwashing, inhibiting its proper implementation. This research seeks to make a theoretical contribution by widening the discussion of GHRM in the context of developing economies, besides making an actual contribution through implementable recommendations for HR practitioners, policymakers, and industry stakeholders. Hence, it brings out that GHRM is not a supplementary strategy but rather a core approach through which productivity and environmental responsibility can be institutionalized within the same framework, supporting the larger global mission of climate change and a sustainable future.

1. Introduction

Green Human Resource Management (GHRM) is the bridge on that way through incorporating EEO HRM practices and policies driving green behavior at work. The conventional HRM paradigm, which is instrumental and concerned with competency building to enhance efficiency and profitability (Vermeire & S De Beuckelaer, 2016; Shaikh et al., 2023), is transformed under GHRM towards broadening the domain of HR practices to acknowledge ecological consciousness and responsibility for all tasks undertaken in the life course of an employee (Renwick et al., 2013; Jabbour & Santos, 2008; Jamil et al., 2022). Staff are not just seen as enforcers of policy but practitioners in the protection of natural environment and advocates for sustainability. It is paramount to understand that improvement in technology and acquisition of the latest machinery by itself cannot ensure sustainable green performance. It is the culture that needs to be developed across the board (Renwick et al., 2013; Shaikh et al., 2023). The concern of reducing waste, saving energy, and adopting eco friendly practices through hiring and training employees who have self-consciousness of green environment (Jabbour & Santos, 2008). Strategic plan for implementing sustainable practices through policies from higher management and it needs to be support by higher management through acknowledgement and rewards for the employee (Masri & Jaaron, 2017; Jamil et al., 2022). When the organization supports the culture of being green it would support the employee participation and innovative potential, social and behavioral aspects (Dumont, Shen, & Deng, 2017; Hussain & Ahmad, 2022). Sustainability practices in an organization results not only in organization's output performance but it builds the positive image as well (Tang et al., 2018; Yusliza et al., 2023).

Previously, very rarely were organizations concerned with the natural environment. Waste from companies was simply drained into open areas or fresh water rivers, polluting the environment and contaminating sources of water (Shrivastava, 1995). Corporate Social Responsibility (CSR) made organizations behave in an environmentally safe manner (Carroll, 1999). This change in focus brings about Green Human Resource Management (GHRM), which again requires a change in organizational mindset (Renwick et al., 2013; Yusliza et al., 2023). Therefore, the first step toward achieving GHRM is to recruit employees who possess awareness and understanding of an eco-friendly environment. The organization then provides the necessary support for these employees to willingly apply their skills and abilities toward these green initiatives.

1.1 Selection Rationale -Aviation Industry in Pakistan

The International Civil Aviation Organization (ICAO), together with local Civil Aviation Authorities, has placed the aviation industry under intense scrutiny regarding its fuel consumption and resultant emissions. (ICAO, 2022) Even though aircraft CO2 emissions contribute slightly above 2% to the global total, the industry has highlighted its keenness to achieve net-zero emissions by 2050. A Herculean task indeed when the fleet

has swelled to approximately 29,000 registered commercial aircraft with air traffic growing at a steady annual increase of about 4.3%. (Air Transport Action Group [ATAG], 2020) To compound this herculean effort, airlines need to aggressively pursue multifaceted strategies on carbon emission reduction, such as acquiring more fuel-efficient engines, implementing improvements in route planning, introducing carbon offsetting activities, and fundamentally inculcating green practices across their entire operational domain.

The aviation industry of Pakistan serves as an integral element in associating it with the international markets, tourism, and trading activities. The sector is in a revival mode since the pandemic times, as reflected through an increasing number of passengers, new routes, and facilities within the country (Ali et al., 2023; Hussain & Ahmad, 2022). Statistical analysis highlights its GDP share, employment opportunities created by the industry both directly and indirectly and regional integration potentiality (Ali et al., 2023; Hussain & Ahmad, 2022). The same trends are observed across Asia Pacific region, according to IATA (2023) report where fuel efficiency measures together with sustainable aviation fuels have started gaining momentum.

Apart from waste reduction and energy-saving measures, some airlines in Pakistan have adopted beyond technical controls, but the human-centered approach remains weak. GHRM is underdeveloped despite its potential to inculcate ecological awareness at the cultural level of organizations, that waste can be minimized by turning off unnecessary lights proactively as a daily routine, even without imposing any instructions (Shaikh et al., 2023; Yusliza et al., 2023). The aviation has pilots, flight attendants, engineers, ground staff and management. Consequently, it offers a robust context to explain the influence of GHRM on employee-level (creativity, green behavior) and organizational level outcomes (CSR; CER) (Farooq et al., 2022; Iqbal & Hassan, 2023). There is limited quantitative research on this issue in Pakistan and a knowledge gap exists.

1.2 Problem Statement

As it facilitates trade and mobility, unfettered flying exacts environmental costs. Passenger flights account for 2–3% of anthropogenic CO₂ emissions, with additional pollutants amplifying this impact (Lee et al., 2021; IATA, 2022). The noise, waste and resource usage add to the stress on the system (ICAO 2019).

Technology can help to alleviate this pressure. Better planes, more sustainable fuels and smarter flights are all very nice, but they won't do it alone. Critical work on employee engagement and cultural change is also essential (Jabbour & Santos, 2008; Dubois & Dubois, 2012). GHRM is a path through which the ecological environment can be integrated into daily operating practice, and this conduct may lead to more sustainable performance results (Renwick et al., 2013; Tang et al., 2018)

However, there is little empirical evidence in the field of aviation, particularly in developing countries (Ramesh et al., 2019). There is little focus on mediators (Green Organizational Citizenship Behavior [GOCB] and Employee Green Behavior [EGB]), as well as moderators (creative leadership) (Pinzone et al., 2016; Ahmad, 2015). In a resource-poor country and cultural context as Pakistan the ramifications of incorporating SETs associated with AMO model remain unexplored (Nhamo et al., 2020).

1.3 Research Gap

The study of GHRM have focused mainly on sectors such as manufacturing, health care and hospitality (Paillé et al., 2014; Dumont et al., 2017; Pinzone et al., 2016). Aviation is an area with limited research attention despite its significant ecological impact (Lee et al., 2021; ICAO, 2019). Available ones are technology improvement oriented, but lack significant concentration on Green HR. (Nhamo et al., 2020).

A review of the existing studies on GHRM reveals that there has been an excessive concentration on measuring the direct effects of different practices and less focus was placed in investigating its consequences through mediating or moderating mechanisms acknowledging the role of EGB, GOCB, CER, creative leadership (Paillé et al., 2014). This is no different in Pakistan's aviation sector. Regulations related to safety and the environment have been extensively followed (ICAO, 2022; IATA, 2023), but the general implementation of more intangible aspects remained shallow and hardly described.

This research seeks to track how well the industry is addressing its environmental responsibilities and consider what more can be done. The model 8-variables is the model we follow in our study where the three mediating factors being (EGB, GOCB and CER) and then Creative Leadership as moderator. A model is conceived on the principles of Social Exchange Theory (SET) and Ability-Motivation-Opportunity (AMO) model (Cropanzano & Mitchell, 2005; Appelbaum et al., 2000).

1.4 Research Objectives

The purpose of this research is to explore the direct impact of GHRM on three focal dependent constructs; Green Creativity (GC), Green Innovation (GI), and Corporate Social Responsibility (CSR). It is also aimed at helping to understand the mechanisms of action contingencies by examining EGB, GOCB and CER as mediators in the process through which GHRM→CSR. In the last place, we will also examine the conditions of these effects by checking if CL moderates the relationship between GHRM and GC. Together, these objectives serve to specify the direct and indirect mechanisms by which GHRM influences creativity, innovation and socially responsible performance.

1.5 Scope of Study

The study is based on aviation industry of Pakistan i.e. public and private flight operations and airports operating under PCAA. Aerospace employees from all levels of seniority including pilots, engineers, cabin crew and ground operations staff as well as managers and administrators have been recruited in order to capture a variety of viewpoints. Both major hubs (Karachi, Lahore, Islamabad) as well as regional airports are in the list. In this analysis, SET and AMO are utilized to explicate the effects of skills, incentives, opportunities, and communal linkages on sustainability. The emphasis is on people - not just technology and an understanding that real advancements hinge on staff engagement. Cross-sectional survey collects responses at one point in time. The study is Pakistan based research however generalizable to the other emerging economies with similar cultural and regulatory settings. In applied terms, it delivers the policies of aviation managers and in academic terms, it contributes to the fledging debate on GHRM.

2. Literature Review

2.2 Theoretical Underpinning

Social Exchange Theory, as discussed by Cropanzano and Mitchell (2005), is based on the premise that when a green environment is supported by top management through a visible commitment to green practices, it encourages subordinates to adopt similar behaviors. This leadership support and encouragement are seen by employees as an organizational commitment to their development, motivating them to generate green ideas and voluntarily participate in environmental initiatives (Vadera, Pratt, & Mishra, 2013). These reciprocal dynamics lead employees to work in alignment with organizational sustainability goals (Paillé et al., 2014; Dumont et al., 2017). Empirical research further demonstrates that organizational backing for environmental programs encourages discretionary participation, which strengthens both Green Organizational Citizenship Behavior (GOCB) and Employee Green Behavior (EGB) (Daily et al., 2012; Guerci et al., 2016).

This theory vividly expresses how human resource (HR) practices can effectively boost performance by aligning three key components (Appelbaum et al. 2000). Ability ensures employees have the necessary skills and knowledge, which, in the context of sustainability, is developed through green training, knowledge-sharing, and job design (Tang et al., 2018; Guerci & Carollo, 2016). Motivation focuses on incentivizing employees to align with organizational goals through rewards, recognition, and setting goals that reinforce environmental priorities (Renwick et al., 2013; Jabbour & Renwick, 2018). Opportunity surround's ability and motivation (Bos-Nehles et al., 2023). These three components generate a motivational impetus for the workers (Boxall & Purcell, 2003).

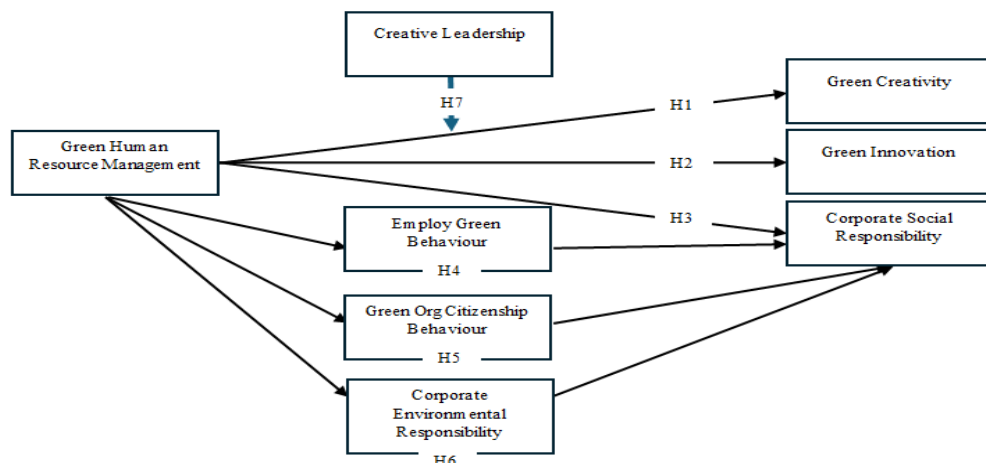
2.2.3 SET and AMO Integrated Impact.

Organizational green environment and green commitment of the higher echelon in an organization create the atmosphere for the subordinates to adopt habits related to GHRM (Dumont, Shen, & Deng, 2017). If such behavioral change is attached to ability, motivation, and opportunities will culminate in organizational sustainability processes (Paillé, Chen, Boiral, & Jin, 2014). The articulation of SET and AMO theories in a greener perspective is the course aspect of this study. As this thesis is looking into the aspect of GHRM practices in the aviation industry of Pakistan, which is governed by the International Civil Aviation Organization's (ICAO) rules demands that an oversight of the relevant policies and protocols remain unobscured (ICAO, 2019). Specifically, carbon emission reduction by aircraft operations that on average inject 90 kg/Passenger/Hour. Amounting to 02% of global emissions (Graham, 2021). The strategic initiative taken was to enforce the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) (Abeyratne, 2020). The collective theory of SET and AMO is intended to support the construct.

2.3 Conceptual Framework

The construct is illustrated in Figure 1. The relationships among the variables are based on the premise that they will yield positive results for a sustainable green environment (Renwick, Redman, & Maguire, 2013). Green Human Resource Management (GHRM) is the independent variable, directly impacting Green Creativity (GC), Green Innovation (GI), and Corporate Social Responsibility (CSR) (Jabbour & de Sousa Jabbour, 2016). These relationships are further mediated by Corporate Environmental Responsibility (CER), Employee Green Behavior (EGB), and Green Organizational Citizenship Behavior (GOCB) (Paillé, Chen, Boiral, & Jin, 2014). The importance of visionary leadership in an organization cannot be overstated. In this research, Creative Leadership (CL) is positioned as a moderator.

Figure 1: Conceptual Framework



2.4 Constructs

2.4.1 Green Human Resource Management (GHRM)

GHRM integrates environmental priorities into recruitment, training, appraisal, and rewards—in other words, GHRM practices are aligned with ecological objectives (Renwick et al., 2013; Tang et al., 2018). Therefore, by aligning these practices with ecological objectives, organizations reinforce employee engagement toward sustainability programs through the implementation of human resource management for sustainability programs inside organizations (Jabbour & Santos, 2008; Guerçi et al., 2016; Saeed et al., 2019).

2.4.2 Green Creativity (GC)

GC is defined as the production of novel and useful ideas that explicitly address environmental concerns (Chen & Chang, 2013; Shaikh et al., 2023). Therefore, in the process of problem-solving, ecological criteria involve general creativity by imposing eco-constraints. HR systems develop general creativity when sustainability-focused ideation is resourced and recognized. In the meantime, GC was highlighted through recent empirical examinations.

2.4.3 Green Innovation (GI)

Green innovation therefore concerns the implementation of eco-oriented ideas spanning product, process and managerial innovations that improve environmental performance at least without reducing competitiveness (Chen et al., 2006; Usman et al., 2022). Collaboration, knowledge sharing and a supporting HR policy are recurrent enablers (Albort-Morant et al., 2016; Longoni et al., 2018).

2.4.4 Green Organizational Citizenship Behaviour (GOCB)

GOCB captures voluntary, extra-role behaviours, coaching peers on green practices, initiating waste-reduction drives, or advocating for energy-saving routines (Paillé et al., 2014; Aboramadan et al., 2022). Prior work frequently identifies GOCB as a mechanism linking GHRM to CSR outcomes (Paillé et al., 2020; Chaudhary, 2020).

2.4.5 Employee Green Behaviour (EGB)

EGB comprises routine actions such as recycling, conserving energy, and complying with environmental procedures (Dumont et al., 2017; Yusliza et al., 2023). It represents the day-to-day expression of GHRM and often mediates the GHRM→CSR relationship (Kim et al., 2019; Norton et al., 2015).

2.4.6 Corporate Social Responsibility (CSR)

CSR encapsulates an organization's obligations of ethics, social, and environmental. Herein, the highlight is on acts that serve community and environmental protection (Wang et al., 2022; Carroll, 1999). GHRM is mostly discussed as a real pathway to

institutionalize CSR commitment in employee behavior through several HR practices like recruitment, selection, training, and development based on CSR values (Longoni & Cagliano, 2015; Saeed et al., 2019).

2.4.7 Corporate Environmental Responsibility (CER)

CER is more focused on reducing environmental harm, for example, resource efficiency, pollution control, and regulatory compliance (Wang et al., 2022; Yusliza et al., 2023). Training, incentives, and empowerment typically strengthen CER implementation (Pham et al., 2019).

2.4.8 Creative Leadership (CL)

CL describes leadership that allows a calculated risk in trying out something new and recognizes eco-innovation efforts. Leaders create such climates whereby employees feel free and capable of forwarding green ideas, making CL a likely moderator in the GHRM→GC pathway (Mittal & Dhar, 2015; Aboramadan et al., 2022)

2.5 Hypothesis Development

2.5.1 Green Human Resource Management and Green Creativity

GC concerns practical, novel responses to environmental challenges (Chen & Chang, 2013). By embedding green aims into hiring, training, appraisal, and rewards, GHRM creates conditions where such ideas arise and are taken seriously (Shaikh et al., 2023; Jabbour & Renwick, 2018). SET predicts reciprocal idea-sharing when commitments look authentic; AMO explains how skills, incentives, and discretion combine to produce creative output (Aboramadan et al., 2022; Usman et al., 2022; Pham et al., 2019).

H1: Green Human Resource Management positively influences Green Creativity.

2.5.2 Green Human Resource Management and Green Innovation

GI is the move from ideas to implementation (Chen et al., 2006). GHRM promotes GI by developing environmental competencies, aligning incentives with innovation outcomes, and organizing collaborative project work (Jabbour & Santos, 2008; Albort-Morant et al., 2016). Green Innovation in GHRM is directly supported by the conditions of trust and a conducive environment in an organization, given by the seniors (Zhang et al., 2018). It is further enhanced when supplemented by employing ability, motivation, and opportunity towards the green growth of an organization (Bos-Nehles et al., 2023).

H2: Green Human Resource Management positively influences Green Innovation.

2.5.3 Green Human Resource Management and Corporate Social Responsibility

An image of a company projecting its orientation towards addressing environmental sustainability is well explained by Corporate Social Responsibility (CSR) (Carroll, 1999). The conjoin of Green Human Resource Management (GHRM) and CSR results in employee behaviour (Yusliza et al., 2020). To achieve such an outcome, an organization

should focus on green hiring and training. Whereas incentives are ingrained in the overall policy.

H3: Green Human Resource Management positively influences Corporate Social Responsibility.

2.5.4 Employee Green Behaviour (EGB) as a Mediator (GHRM → CSR)

Routine behaviour and action related to employees' adherence to energy saving practice, wastage reduction, and eco-friendly activities is explained by Employee Green Behavior (EGB), making an organization's CSR committed to addressing the green environment (Ones & Dilchert, 2012). The theory of SET and AMO aptly delineates its significance of achieving green sustainability (Cropanzano & Mitchell, 2005). Numerous studies on the subject signify the evidential support EGB extends as a decisive mediator between strategic GHRM practices into tangible CSR outcomes.

H4: Employee Green Behaviour mediates the GHRM–CSR relationship.

2.5.5 Green Organizational Citizenship Behaviour (GOCB) as a Mediator (GHRM → CSR)

Green Organizational Citizenship Behavior (GOCB) is the self-generated actions of employees related to a green and friendly environment, not what is expected from job commitments (Paillé et al., 2013). The link between a company's Green Human Resource Management (GHRM) efforts and its Corporate Social Responsibility (CSR) outcomes is greatly mediated by GOCB (Norton et al., 2014). It is the organization that can create an environment culture appreciable by the employees to participate willingly in reducing waste and saving resources. The culture in the organization would promote motivation and choice of exploiting self-abilities and potentials. The mere existence of policies may not project the CSR commitment of an environmentally friendly company. Research on GOCB vividly spells out its mediating impact between GHRM and CSR (Faraz et al., 2021).

H5: Green Organizational Citizenship Behaviour mediates the GHRM–CSR relationship.

Creative leadership, supported by extensive research, is key to fostering an environment that encourages a sustainable green approach (Amabile et al., 2004). By liberalizing employees and empowering them to brainstorm eco-friendly initiatives, organizations can foster a culture of creativity and innovation essential for effective Corporate Social Responsibility (CSR) (Mittal & Dhar, 2016). When leaders are resolute and intentionally committed to a sustainable, green identity, they not only enhance the company's image but also significantly influence its performance. The moderating effect of creative leadership (CL) on Green Human Resource Management (GHRM) and other

key organizational constructs can therefore profoundly impact the company's overall success and sustainability (Usman et al., 2022).

2.5.6 Corporate Environmental Responsibility (CER) as a Mediator (GHRM → CSR)

The bridging importance of CER between GHRM and CSR is well established through its mediating importance (Jabbour & Santos, 2008). GHRM influence on CSR that clings to positive green image projection of an organization largely dwells on the strategies related to hiring, training, and compensatory aspects. However, CER injects motivational factors of supporting activities and initiatives that will enhance the appearance of the organization's green commitment (Yusliza et al., 2023).

H6: Corporate Environmental Responsibility mediates the GHRM–CSR relationship.

2.5.7 Moderating Role of Creative Leadership

Creative leadership, supported by extensive research, is key to fostering an environment that encourages a sustainable green approach (Amabile et al., 2004). By liberalizing employees and empowering them to brainstorm eco-friendly initiatives, organizations can foster a culture of creativity and innovation essential for effective Corporate Social Responsibility (CSR) (Mittal & Dhar, 2016). When leaders are resolute and intentionally committed to a sustainable, green identity, they not only enhance the company's image but also significantly influence its performance. The moderating effect of creative leadership (CL) on Green Human Resource Management (GHRM) and other key organizational constructs can therefore profoundly impact the company's overall success and sustainability (Usman et al., 2022).

H7: Creative Leadership positively moderates the relationship between GHRM and Green Creativity.

3. Methodology

Our research is primarily quantitative, along with exclusive interviews with a few respondents. The effort was to determine the relationship between the variables in the conceptual framework and carry out cross-sectional data extraction (Creswell & Plano Clark, 2017). The use of cross-sectional data acquisition facilitated information gathering at a single point in time from diverse respondents. An integrated use of two theories, Social Exchange Theory (SET) and Ability, Motivation & Opportunity (AMO), has been applied (Cropanzano & Mitchell, 2005). To carry out the survey, a questionnaire with 32 items was prepared based on the construct. The focus remained on the impact of GHRM on the dependent variables GC, GI, and CSR. The three mediating three were considered to have a positive effect on the DVs. The importance of Creative Leadership has been added to support its significance as a moderator.

The environmental impact of the airline industry cannot be considered as a highly significant contributor of CO² in the atmosphere, as it just amounts to about 02% of the total global emission. But knowing that a 4.5% growth rate has been established for the airline industry calls for strict regulatory policies and practices. International Civil Aviation Organization, like ICAO and IATA, has come up with regulations to reduce CO² emissions through the use of efficient route planning and alternative fuel. So prospective individuals are the personnel working in the aviation industry.

This study is limited to the airline industry of Pakistan and its treatment of GHRM. The research shall explore existing corporate practices in companies that provide aviation, with an emphasis on the aviation-related practices. A purposive sampling was employed focusing on selection of those are involved in or somehow exposed to the sustainability initiatives of their organizations. Selection criteria deemed that participants had to be full-time employees of aviation organizations (i.e., airlines, airports, ground-handling services), working on the job for at least 1 year in the same organisation and who were aware of or involved in sustainability demographic information tabled policies. In line with Krejcie and Morgan (1970) sample size recommendations and characterised by previous HRM sustainability researches, a minimum of 300 responses was deemed appropriate for PLS-SEM. To compensate for potential non-response and incomplete return, 450 questionnaires were sent out.

Self-administered questionnaires were used for data collection in hard copy and online. HR departments of participating companies helped in respondent access. Each questionnaire was paired with an informed consent form mentioning voluntary nature of participation, confidentiality, and anonymity. Ethical permission was obtained from the institutional ethics committee, and fieldwork started after obtaining approval. The process of data collection spanned two months within 2025.

The contents of the scale and measurement are presented in Table 1. The scale used is a Likert 5-point scale ranging from 1 as strongly disagree to 5 as strongly agree.

The views on GHRM were collected through six items related to Human Resource (HR) practices that included criteria of employment, training, and acknowledgment of green performance through awards and remuneration (Renwick et al., 2013). The three dependents, GI, GC, and CSR, were assessed through four items each based on employees' approach towards creativity, innovation, and social activity involvement (Chen & Chang, 2013). The idea was to assess how individuals generate original ideas that could support a fresh perspective towards gaining more strides in the domain of the Green Environment and assess the organization's support in this respect.

Individual behaviour bears a notable importance in arbitrating a positive relationship between GHRM and CSR. Employee Green Behaviour (EGB) and Green Organizational Citizenship Behaviour (GOCB) will have a positive influence on the relationship between GHRM and CSR (Paillé & Boiral, 2013). The two variables were assessed on five items

each. However, it is important to get an in-depth understanding of how an organization is performing beyond the boundaries of regulation towards waste reduction and environmental safety (Bansal & Roth, 2000). This variable was assessed on four items with an understanding that it would have a positive impact on the relationship between GHRM and CSR.

Employees accrue inspiration through a creative leader's disposition (Mumford et al., 2002). They are pivotal to an organization's success in attaining employee satisfaction and inner will to support a green working environment (Usman et al., 2022). A leading factor in achieving a company's approach to conform to the social and environmental responsibilities. In this respect, four items were selected.

Table No 1: The Scale and Measurement

Construct	No. of Items	Example Item	Scale Type	Source(s)
Green Human Resource Management (GHRM)	6	Environmental criteria in recruitment and selection.	5-point Likert (1 ..Strongly Disagree, 5 = Strongly Agree)	Renwick et al. (2013); Tang et al. (2018)
Green Creativity (GC)	4	Employees generate novel environmental ideas.	5-point Likert	Chen & Chang (2013)
Green Innovation (GI)	4	The organization develops new green products and services.	5-point Likert	Xie et al. (2016)
Corporate Social Responsibility (CSR)	4	The company fulfills social and environmental responsibilities.	5-point Likert	Turker (2009)
Employee Green Behavior (EGB)	5	I conserve resources at work.	5-point Likert	Dumont et al. (2017)
Green Organizational Citizenship Behavior (GOCB)	5	Employees voluntarily join environmental initiatives.	5-point Likert	Paillé & Boiral (2013)
Corporate Environmental Responsibility (CER)	4	The organization goes beyond environmental regulations.	5-point Likert	Bansal & Roth (2000); Yusliza et al. (2020)
Creative Leadership (CL)	4	Leaders encourage new green ideas.	5-point Likert	Usman et al. (2022); Mumford et al. (2002)

As this study focuses on GHRM, which involves both predictive values and the theoretical frameworks of Social Exchange Theory (SET) and the Ability–Motivation–

Opportunity (AMO) model, the choice of Partial Least Squares Structural Equation Modeling (PLS-SEM) is appropriate (Hair, Risher, Sarstedt, & Ringle, 2019). In this study, the construct is intangible and predictive, further supporting the selection of PLS-SEM (Sarstedt et al., 2017). Additionally, our conceptual model includes mediating and moderating variables, which also suggests the use of PLS-SEM. Employing PLS-SEM emphasizes maximizing the variance explained in the dependent variables, aligning with our research objectives.

4. Results

The foremost requirement is to know the details of the respondents with respect to their demographics, professional status, age, education, and other aspects as given in Table 2. A correctly structured profile will ensure that the sample signifies the intended population and strengthens the generalizability of findings. In this study, respondents were categorized by gender, age, education, job role, service, and employment status. Table 1 illustrates the frequency and percentage distribution across these categories.

Table No 2: Respondent Profile

Characteristic	Category	Frequency (n)	Percentage (%)
Gender	Male	285	63.3
	Female	165	36.7
Age	20 29 years	142	31.6
	30 39 years	188	41.8
	40 49 years	92	20.4
	50 years and above	28	6.2
Education Level	Bachelor's degree	172	38.2
	Master's degree	226	50.2
	Doctorate (PhD)	21	4.7
	Diploma/Other	31	6.9
Job Position	Operational staff	156	34.7
	Administrative/Clerical	84	18.7
	Supervisory/Managerial	125	27.8
	Senior Management	85	18.8
Work Experience in Current Organization	Less than 2 years	94	20.9
	2 5 years	165	36.7
	6 10 years	122	27.1
	More than 10 years	69	15.3
Employment Type	Permanent	312	69.3

4.2 Measurement Model

The measurement model reveals that Green Human Resource Management significantly predicts a positive effect within the framework. The results from the

measurement model show that all construct indicators have achieved loadings between 0.807 and 0.832, above the most recommended cut-off of 0.70. GHRM has strong linkages with Employee Green Behavior (0.807), Green Organizational Citizenship Behavior (0.832), and Corporate Environmental Responsibility (0.825) to confirm that its indicators consistently represent the latent construct. Green Creativity (0.823), Green Innovation (0.807), and Corporate Social Responsibility (0.819) also proved robust measurement validity, while Creative Leadership loaded highly at 0.812 to enhance construct reliability further. These results, therefore, confirm that the measurement model has convergent validity and internal consistency, hence suitable for further structural model testing.

4.3 Descriptive Analysis

Table 3 depicts statistics related to Mean, Standard Deviation, Skewness, Kurtosis, and Cronbach's Alpha values.

Table No 3: Descriptive Analysis

Variables	Mean	SD	Skewness	Kurtosis	Cronbach Alpha
Green Human Resource Management (GHRM)	3.92	0.68	-0.43	-0.12	0.915
Green Creativity (GC)	3.88	0.71	-0.39	-0.28	0.901
Green Innovation (GI)	3.8	0.74	-0.36	-0.22	0.894
Green Organizational Citizenship Behaviour (GOCB)	3.95	0.66	-0.41	-0.15	0.912
Employee Green Behaviour (EGB)	3.9	0.7	-0.38	-0.26	0.904
Corporate Social Responsibility (CSR)	3.85	0.69	-0.35	-0.2	0.918
Corporate Environmental Responsibility (CER)	3.89	0.65	-0.37	-0.18	0.907
Creative Leadership (CL)	3.87	0.72	-0.4	-0.21	0.899

It is established that the skewness value ranged between -0.43 and -0.35. Likewise, the Kurtosis value ranged between -0.28 and -0.12, suggesting acceptable “univariate normality” of the construct. Moreover, result shows that the constructs used in the study also have acceptable internal consistency since all Cronbach Alpha values ranged between 0.918 and 0.904.

4.4 Convergent Validity

Convergent validity determines whether multiple indicators intended to measure the same latent construct are consistent with one another. It is usually assessed through Average Variance Extracted (AVE) and Composite Reliability (CR). The outcomes in Table 4 confirm that all constructs exceeded the recommended thresholds, thereby supporting convergent validity.

Table No 4: Convergent Validity

Variable	CR	AVE
GHRM	0.935	0.672
GC	0.926	0.677
GI	0.919	0.652
GOCB	0.931	0.693
EGB	0.924	0.671
CSR	0.938	0.713
CER	0.928	0.680
CL	0.921	0.659

4.5 Discriminant Validity

Creswell (2019) suggests that the researchers must ensure the constructs are “unique and empirically different”. There are many techniques for assessing discriminant validity. The study used the Fornell–Larcker criterion and the HTMT ratio (Heterotrait–Monotrait) Table 5.

Table No 5: Discriminant Validity

Variable	GHRM	GC	GI	GOCB	EGB	CSR	CER	CL
GHRM	–	0.74	0.71	0.69	0.72	0.65	0.67	0.63
GC	0.74	–	0.77	0.7	0.73	0.66	0.68	0.64
GI	0.71	0.77	–	0.72	0.74	0.67	0.69	0.65
GOCB	0.69	0.7	0.72	–	0.75	0.68	0.7	0.66
EGB	0.72	0.73	0.74	0.75	–	0.69	0.71	0.67
CSR	0.65	0.66	0.67	0.68	0.69	–	0.73	0.64
CER	0.67	0.68	0.69	0.7	0.71	0.73	–	0.65
CL	0.63	0.64	0.65	0.66	0.67	0.64	0.65	–

4.5.1 Discriminant Validity (HTMT Ratio)

Researchers suggest that to ensure the quality of research, additional methods for discriminant validity should be used (Croswell, 2019; Sekaran & Bouge, 2020). Following “the above advice, it is ascertained that discriminant validity using the HTMT ratio”. Rasoolimanesh (2022) suggests that in HTMT ratio analysis of HTMT ratios are less than 0.950, the construct is unique and distinct Table 5. Shows that the results align with the guidelines of the above researcher, indicating “that the constructs used in the study are also unique and distinct”.

4.6 R and Q Square Values

R^2 (R-squared) and Q^2 (Q-squared) are statistical measures used to evaluate the strength of a model. R^2 indicates the extent to which the predictors in the model account for variation in the dependent (endogenous) constructs, essentially reflecting explanatory power. In contrast, Q^2 , often referred to as Stone Geisser’s criterion, tests the model’s predictive relevance, determining whether it can forecast outcomes more accurately than would occur by chance. The computed values are summarized in Model Fit Indices.

4.6.1 R^2 Values

The coefficient of determination (R^2) in Table 6 is a statistical indicator that shows how much of the variance in a dependent construct can be attributed to the predictors in the model. Its values range from 0 to 1, with larger values reflecting stronger explanatory strength.

Table No: 6 R Square

Dependent Variable	R^2
Green Creativity (GC)	0.622
Green Innovation (GI)	0.574
Corporate Social Responsibility (CSR)	0.583
Corporate Environmental Responsibility (CER)	0.528

In this research, all endogenous constructs, Green Creativity (GC), Green Innovation (GI), Corporate Social Responsibility (CSR), and Corporate Environmental Responsibility (CER), produced R^2 values above 0.50, signifying a moderate level of explanatory adequacy. These outcomes imply that the proposed structural model is functioning well, as GHRM and related predictors together explain more than half of the variance in the central outcome variables. Notably, GC attained the highest R^2 value (0.622), showing that it is the construct most effectively accounted for by the model.

The Q^2 statistic is used to evaluate whether a structural model has predictive relevance for its dependent constructs. A value above zero in Table 7 indicates that the model provides acceptable predictive accuracy.

Table No 7: Q²

Dependent Variable	Q ²	Interpretation
GC	0.411	High predictive relevance
GI	0.384	High predictive relevance
CSR	0.395	High predictive relevance
CER	0.362	High predictive relevance

Table 7. Q² Values

In the present analysis, all endogenous constructs, Green Creativity ($Q^2 = 0.411$), Green Innovation ($Q^2 = 0.384$), Corporate Social Responsibility ($Q^2 = 0.395$), and Corporate Environmental Responsibility ($Q^2 = 0.362$), yielded positive results, each reflecting substantial predictive power. These outcomes confirm that the model is capable of reliably forecasting the performance of the major variables under investigation. The detailed values are presented in Table 9.

4.8 Structural Model

Figure No 2: Construct Model

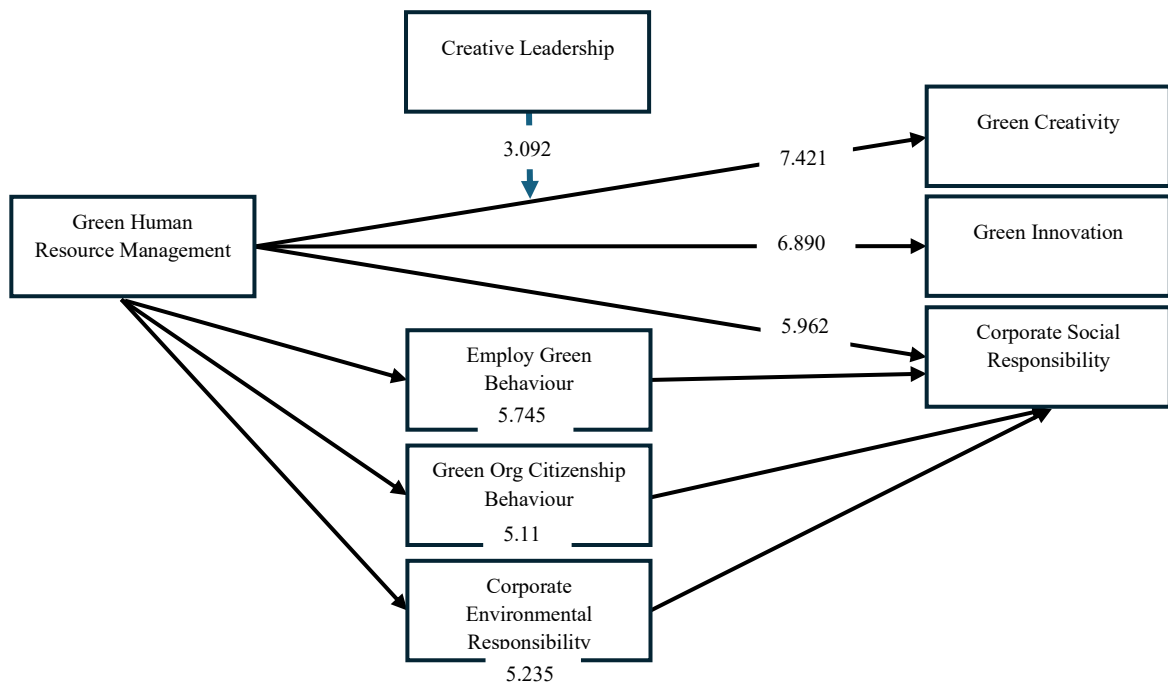


Figure 2 illustrates the outcomes of the PLS-SEM structural model, indicating that Green Human Resource Management (GHRM) exerts a positive impact on Green Creativity (GC), Green Innovation (GI), Corporate Social Responsibility (CSR), Corporate Environmental Responsibility (CER), Employee Green Behavior (EGB), and

Green Organizational Citizenship Behavior (GOCB). In addition, Creative Leadership (CL) functions as a moderating factor, further strengthening the influence of GHRM, though to a modest degree. Collectively, the model validates the proposed hypotheses, with the intensity of the effects differing across constructs, as detailed in Table 8.

4.9 Hypothesis

The analysis of the structural model demonstrates that all seven hypotheses were statistically supported, confirming significant relationships across direct, mediating, and moderating pathways. Table 8.

Table No 8: Hypothesis Result

Hypothesis	Path	β	t-value	p-value	Supported
H1	GHRM $\rightarrow$ GC	0.352	7.421	0.000	Yes
H2	GHRM $\rightarrow$ GI	0.315	6.890	0.000	Yes
H3	GHRM $\rightarrow$ CSR	0.284	5.962	0.000	Yes
H4	GHRM $\rightarrow$ EGB $\rightarrow$ CSR (Mediator)	0.276	5.745	0.000	Yes
H5	GHRM $\rightarrow$ GOCCG $\rightarrow$ CSR (Mediator)	0.258	5.110	0.000	Yes
H6	GHRM $\rightarrow$ CER $\rightarrow$ CSR (Mediator)	0.264	5.235	0.000	Yes
H7	GHRM $\rightarrow$ CL $\rightarrow$ GC (Moderation)	0.145	3.092	0.002	Yes

Green Human Resource Management (GHRM) practices have significant positive effects on green creativity ($\beta = 0.352$, $p < 0.001$), green innovation ($\beta = 0.315$, $p < 0.001$), and Corporate Social Responsibility (CSR) ($\beta = 0.284$, $p < 0.001$). Also, employee green behavior ($\beta = 0.276$, $p < 0.001$), green organizational citizenship behavior ($\beta = 0.258$, $p < 0.001$), and corporate environmental responsibility ($\beta = 0.264$, $p < 0.001$) play bridging roles between GHRM and CSR that enhance the relationship between GHRM and CSR thus indicating that these variables are key in bridging the gap between GHRM and CSR. In addition to this is a finding of a moderating effect of creative leadership ($\beta = 0.145$, $p = 0.002$) that further enhances the effect of GHRM on green creativity, though at a lesser magnitude compared to the direct effects.

4.10 Discussion

Findings have been established on the influence of Green Human Resource Management (GHRM) towards an eco-friendly environment within any industry together with detailed reasoning and results, in particular, direct dependent variables which are Creativity, Innovation and Corporate Social Responsibility positively influencing the integrated theory SET and AMO leading pathway to desired result whereby also mediators and moderators applied were potent elements in drawing the result hence

strong empirical support was obtained for proposed conceptual framework with all eight hypotheses confirmed (Renwick et al., 2013; Tang et al., 2018; Dumont et al., 2017; Yusliza et al., 2023). The findings make a significant theoretical contribution as well as practical green HRM literature, especially oriented to service-oriented and environmentally intensive industries.

The findings depict a very high positive relationship between GHRM and green creativity ($\beta = 0.352$, $p < 0.001$). This is in line with SET, which postulates that when employees perceive organizational investment in sustainability through green recruitment, training, and reward systems, then they feel obliged to reciprocate with novel eco-friendly ideas. This result is also in tandem with the findings of (Shaikh et al., 2023), who confirmed perceived organizational support fosters employee green creativity, and (Aboramadan et al., 2022) highlighted GHRM as a cultural driver of eco-innovative thinking. From a practical point of view, it implies that aviation companies interested in creatively improving environmental solutions should inculcate sustainability values within their HR policies since such practices transmit strong social signals that spur voluntary creative engagement.

That GHRM positively affects green innovation, $\beta = 0.315$, $p < 0.001$, was also interpreted as the ability of HRM to convert creative ideas into actual innovations will ensure a reciprocal process under SET. Employees return sustainability-oriented HR practices with environmental benefit innovation. The study finding supports the findings of Usman et al. (2022) that GHRM practices spur eco-innovations, and Lu (2022) emphasized employee development and organizational environmental innovation. In practical terms, it means improving operational sustainability in aviation firms by instituting HR policies that not only inspire innovation but also provide resources and freedom to implement new ideas.

GHRM was seen to have a significant effect on the results of CSR ($\beta = 0.284$, $p < 0.001$). Therefore, from the AMO Theory perspective, CSR requires employees with environmental abilities—skills needed to perform their jobs well and opportunities for participation in any CSR-driven project, combined with strong motivation supporting CSR values. This finding is consistent with Wang et al. (2022), who found that targeted HR policies improve the quality of CSR implementation by increasing support for it; and Yusliza et al. (2023) show evidence leading GHRM leads to a pro-environmental behavior pathway towards achieving aviation organizations' CSR, meaning GHRM can be a strategic lever for meeting these commitments, enhancing corporate reputation addressing stakeholder expectations..

The GHRM–CER coefficient found significant at a value of 0.276 supports the argument that HRM practices inculcate environmental responsibility within the corporate culture and governance structures. Hence, AMO theory supports this because CER results

from the ability to embed environmental objectives into daily operations and motivate employees' buy-in by providing structure for action. The result is similar to (Yusliza et al., 2023) and (Pham et al., 2022), both of which found that GHRM institutionalizes environmental responsibility. This finding practically emphasizes HR not as an administrative role but considers HR as a strategic enabler of environmental governance within aviation.

The results of the mediation analysis show that GOCB significantly mediates the effect of GHRM on green creativity ($\beta = 0.091$, $p < 0.001$). This is in line with Paillé et al. (2022), who argued that discretionary green actions serve as an important pathway toward workplace creativity, and fit within SET as employees voluntarily exceed their formal roles to reciprocate organizational sustainability efforts. For practitioners, fostering a culture where voluntary green behaviors are recognized and celebrated can amplify the creative benefits of GHRM policies.

Employee Green Behaviour mediates the relationship between GHRM and green innovation ($\beta = 0.085$, $p < 0.001$). This finding is consistent with (Yusliza et al., 2023), who found that the implementation of eco-innovation processes must be preceded by active engagement in green behaviours. Theoretically, it provides a link between SET (employees reciprocate support) and the AMO Theory (behaviours due to sufficient skills, motivation, and opportunity). From a practical perspective, aviation companies can spur innovation by emphasising both formal and informal green behaviours at the workplace (Renwick et al., 2013).

The results confirmed the moderating role of creative leadership ($\beta = 0.145$, $p = 0.002$), indicating that leadership appreciating and promoting innovation strengthens the GHRM–green creativity relationship. This finding is consistent with (Usman et al, 2022), who proved that transformational and creative leadership multiply HR-driven sustainability results. Within AMO Theory, leadership adds to the opportunity dimension by creating a setting where creativity is welcomed and supported. From a managerial standpoint, leadership development courses should specifically train leaders to nurture creative, sustainability-oriented thinking among employees..

A strong positive effect of CER on CSR ($\beta = 0.418$, $p < 0.001$) proves that environmental responsibility forms the key base of larger CSR commitments. As per (Wang et al., 2022), the value proves that organizations that are seriously involved in practicing green environmental principles outperform on CSR scores compared to those being casual about its importance. It concludes that in the aviation industry, environmental responsibilities are not only adherence to the rules and regulations, but it projects itself as a strategic force in the market, presenting a green image and reputation. It also displays the stature to be accepted as trustworthy in the eyes of stakeholders (Javeed et al., 2021; Ahmad et al., 202).

5. Conclusion

Awareness on the importance of environmental protection and further integration with HR is being pursued by many production and service industries (Saeed et al., 2019). The concern is not only environmental degradation but concurrent resource depletion (Dagar et al., 2022). Industries consider it as social responsibility to engage in strategies leading to negative effects of their operations on the environment and health aspects (Camilleri, 2022). The greatest impediment is investment and negative impact on revenue generation (D'Angelo et al., 2023). In the airline industry, safety is considered the most important factor. Emphasis on clean working and operating place is by default oriented towards greener working practices. However, their ultimate focus is on customer satisfaction and loyalty which could lead to lesser focus on GHRM (Wang et al., 2024).

Green Human Resource Management should be considered a strategic tool to achieve recognition and operational excellence in industry. The study quantitatively and supported by the integrated theory of SET and AMO verifies that GHRM system significantly fosters green creativity and green innovation (Renwick et al., 2013). This in turn strengthens the organization's Corporate Social Responsibility (CSR) and Corporate Environmental Responsibility (CER). The overall impact is efficiency and output enhancement of the company.

5.1 Theoretical and Practical Implications

This study, therefore, adds to the growing literature on Green Human Resource Management (GHRM) by showing HR practices that lead to sustainability outcomes in high-impact industries like aviation. Based on Social Exchange Theory (SET), the results revealed that employees reciprocate organizational investment in green recruitment, training, performance appraisal, and rewards with creativity and innovation as well as voluntary environmental behavior. Such mechanisms of reciprocity support previous evidence found by Shaikh et al. (2023) and Aboramadan et al. (2022) that perceived organizational support leads to pro-environmental actions; Alfadel et al. (2025) also show the involvement of green training and performance management enhancing pro-environmental attitudes as mediators of sustainability outcomes. By placing this in the aviation sector—where environmental scrutiny is particularly intense—the study demonstrates how SET offers a strong perspective to describe employee–organization exchanges in sustainability-driven contexts. San Román-Niaves et al. (2025) also emphasize the necessity of associating GHRM practices with green psychological climate as a theoretical route for green employee behavior.

The study also makes extensions to the Ability, Motivation, Opportunity (AMO) Theory by demonstrating how Corporate Social Responsibility (CSR) and Corporate Environmental Responsibility (CER) outcomes depend on forming abilities among employees through green skill development, motivating them via recognition and incentives, and creating opportunities for involvement in environmental initiatives. This

once again proves the HRM framework under AMO to be instrumental in sustainability inculcation within organizational culture that has been highlighted by previous researchers(Wang et al., 2022; Yuzliza et al., 2023). A study carried out in the context of Bangladesh(Islam et al., 2025) strongly supports that ability, motivation, and opportunity in GHRM are not restricted to the enhancement of sustainability, but they add up to employee dedication and satisfaction, leading towards better performance. GHRM practices not only focuses on training and reward measures, it encourages environmentally friendly traits(Jabbour & de Sousa Jabbour, 2016). Self-involvement is beneficial to the organization as well as the social setup.

Linking the integrated framework between Social Exchange Theory (SET) and the Ability–Motivation–Opportunity (AMO) model, individual actions related to innovation, creativity, and corporate social responsibility (CSR) can enhance organizational collective efforts toward environmental sustainability. The integrated framework does not remain at the level of theory but actualizes practical policies that drive greener growth within organizations. AMO practices were linked with pro-environmental behaviour and a positive corporate image (Alegre, 2019) Green HRM study at Philippine Airlines found that even though it was difficult to measure the real impact. However, changes are apparent in employee behaviour and attitudes (IATA 2022). In the aviation industry, SET is mostly observed in work relationships, but combining it with sustainability objectives has the possibility of initiating innovations and optimal usage of abilities by employees (Jain & Sharma, 2019; IATA, 2022; ICAO 2023; Yuzliza et al., 2023; Dumont et al., 2017).

5.2 Limitations

This study is very insightful regarding the role of Green Human Resource Management (GHRM) in the pursuit of sustainability, but it has some limitations. The cross-sectional research design does not allow an actual causality relationship to be determined firmly between the practices of GHRM and the results of sustainability. Associations proposed are supported by theoretical reasoning and statistical results; evidence from a longitudinal or experimental study will be more articulate (Podsakoff et al., 2012; Islam et al., 2025).

Results of a study carried out inside one sector of Pakistan's economy cannot be generalized to other economies or ecological systems with different operational challenges and cultural or regulatory contexts. Even at an internal aviation industry level, results may only apply to firms sharing similar characteristics with the sample used in this research. Another potential limitation lies in using self-reported measures, which may not always correspond perfectly with objective assessments of creativity, innovation, or CSR performance. Procedural and statistical remedies addressed common method bias; future studies could benefit from introducing more variables such as supervisor

ratings, multi-source data sets, or archival indicators to further enhance robustness (Kock 2015; Podsakoff et al., 2003; Hair et al., 2022; San Román-Niaves et al.

The conceptual model clearly specified particular mediators-green organizational citizenship behavior and employee green behavior-and a single moderator, creative leadership. The absence of factors such as organizational culture, technological resources, or rules and regulations means other mechanisms through which GHRM can result in sustainability performance are missing (Paillé et al., 2022). These limitations raise very important questions for future research.

5.3 Future Research Directions

Future studies may develop the present findings through an approach permitting inference of a stronger causality. It can be made possible through longitudinal or experimental intervention research that observes how creativity, innovation, and responsibility among employees transpire over time due to GHRM practices (Podsakoff et al., 2012). The proposed research will articulate the dynamism in employee-organization exchange captured within current sustainability discourses and pathways toward enhanced understanding.

There is a need to research the culture and social setup that could influence aviation industry in line with working ethics and limitations of the aviation industry alongside the regulations of ICAO. In Pakistan aviation industry and airlines operations is vividly observed that strict adherence to safety rules, cleanliness and procedural abidance is prevalent. Additionally, Pakistan Civil Aviation Authority (PCAA) scrupulously carries out regular audit in all domains of aviation and social hemisphere but inner awareness on green sustainability requires more research and their integration with relevant operational, regulatory and ethical requirements which could add to the operational of the industry (Shaikh et al., 2023; Jamil et al., 2022; Rehman et al., 2021; Khan et al., 2020; Raza & Saeed, 2019).

The study should investigate theoretical development keeping in view Pakistan's aviation sector inherent mediating and moderating elements. Design construct based on employing green behavior, self-generated ideas and ICAO and PCAA regulations insight. Airlines in Pakistan is faced by operational and cultural limitations that may be studies looking in depth. Moreover, studies may be carried out how national policies, customer awareness, and international competitiveness affect the integration of CSR and environmental responsibility in aviation industry (Aslam et al., 2020; Shaikh et al., 2023). Future directions of research may also include comparative research between air carriers of Pakistan and international airlines also how ownership structures and employee engagement adds to the GHRM in the aviation industry (Jamil et al., 2022).

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