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Embracing Sustainability: Assessing The Drivers Of Sustainable Performance

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ABSTRACT:

This study explores Green Human Resource Management (GHRM) practices and transformational leadership focused on environmental sustainability in Pakistan's dairy industry. It also looks into how pro-environmental behavior plays a mediating role between GHRM practices, environmental-specific transformational leadership, and sustainable behavior. Additionally, the study examines how a pro-environmental attitude influences the relationship between GHRM practices and environmental-specific transformational leadership. The study targets employees in dairy organizations across Pakistan, using simple random sampling for data collection. Data were gathered through a survey questionnaire, and after screening, 430 responses were analyzed using Structural Equation Modeling (SEM). The results show that GHRM practices significantly enhance employees' environmental and sustainable behaviors. Environmental-specific transformational[1] leadership positively impacts pro-environmental behavior, though its effect on sustainable performance is minimal. However, GHRM practices and environmental-specific transformational leadership contribute indirectly to sustainable performance through environmental behavior. The pro-environmental attitude strengthens the effects of GHRM practices and environmental-specific transformational leadership on pro-environmental behavior, leading to sustainable performance. This study is one of the few that investigates the combined impact of GHRM practices and environmental-specific transformational leadership on pro-environmental behavior and sustainable performance within environmental management. It offers valuable insights by proposing a framework to improve sustainable performance through these practices in the dairy industry. The findings suggest that a combination of GHRM practices and environmental-specific transformational leadership is essential for fostering pro-environmental behavior and achieving sustainable performance. This approach can assist managers in promoting environmentally friendly behaviors by leveraging a pro-environmental attitude to support the implementation of environmental policies aimed at achieving sustainable outcomes for dairy firms.

INTRODUCTION:

Sustainability presents both challenges and opportunities, which means food and dairy organizations must rethink their strategies to achieve sustainable performance (Origin Green, 2020). To promote environmental sustainability, organizations adopt Green Human Resource Management (GHRM) practices, which focus on energy conservation, reducing emissions, reengineering systems, managing waste, and recycling (Molina-Azorin et al., 2021). These practices not only enhance environmental sustainability but also improve the organization's

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economic and social performance (Mousa and Othman, 2019). Green Human Resource Management (GHRM) plays a crucial role in achieving sustainable performance (Bombiak and Marciniuk-Kluska, 2018) because human resources are key to driving green and sustainability-focused initiatives. Sustainable performance is at the heart of GHRM practices (Jabbour and Renwick, 2020). A positive environmental attitude among employees and a strong sense of responsibility for the environmental impact of their actions contribute significantly to sustainable performance (Bombiak and Marciniuk-Kluska, 2018). Researchers are focusing on GHRM as a modern concept because of its potential to foster environmentally-friendly behaviors in employees (Joyce and Vijai, 2020). While the important role of human resources in achieving sustainable performance is well recognized, earlier research has primarily focused on different HRM practices to implement a green approach for sustainability (Labella-Fernandez & Martinez-del Rio, 2019).

Previous research (Shoaib et al., 2021; Sharma and Gupta, 2020; Mousa and Othman, 2019; Shaban, 2019; Yong et al., 2018) has focused on various aspects of Green HRM, such as green intellectual capital, green hiring, green training, green performance management, and green rewards, exploring their impact on different performance outcomes. However, the concept of work-life balance as part of Green HRM has received little attention. Muster and Schrader (2011) introduced the idea of "green work-life balance" and suggested it could be studied within the GHRM framework. Despite this, there is minimal evidence in the literature that green work-life balance is recognized as a key indicator of GHRM practices (Ari et al., 2020). To address this gap, this study includes green work-life balance as a crucial element of GHRM practices.

1) THEORETICAL FRAMEWORK AND DEVELOPMENT OF HYPOTHESIS

2.1. SOCIAL COGNITIVE THEORY (SCT)

Social Cognitive Theory (SCT), developed by Bandura (1986), forms the basis of this study. SCT emphasizes three key elements: personal factors, environmental factors, and behavior. People's attitudes, knowledge, experiences, and the environment around them shape their behaviors. In the workplace, employees learn behaviors and cognitive strategies by observing their colleagues and leaders (Green and Piel, 2009). These learned behaviors, focused on specific goals, eventually become self-regulated actions.

Given the environmental challenges, sustainable development has become a critical aspect of corporate operations. To achieve sustainability, organizations increasingly rely on their human resources. Green HRM is a vital part of an organization’s sustainability efforts, as it influences how the organization interacts with its external environment, impacting its performance, the environment, and society (Saifulina et al., 2020). Green HRM has been identified as a key factor in promoting green behaviors and practices among employees (Dumont et al., 2017).

The theoretical foundation of this study suggests that when organizations equip their employees with unique green skills, enhance their enthusiasm, and provide more opportunities to practice green behaviors, they can achieve better sustainable performance (Akanmu et al., 2020). Organizations that go beyond legal environmental standards may be more inclined to invest in green practices and research and development (R&D), leading to innovative products and services that enhance growth, survival, and positive social and ecological impacts. This can result in better market performance, increased customer satisfaction, a strong brand, and favorable stakeholder perceptions, enabling the organization to achieve sustainable performance and long-term survival.

Moreover, an organization's commitment to Green HRM can positively influence its ability to achieve long-term success in social responsibility by fulfilling its duties to its workforce (Agudelo et al., 2019; Sameer, 2021). Managing human resources with a green focus is essential for fostering employee engagement in environmental sustainability goals within the firm (Ababneh, 2021) and for better aligning corporate sustainability objectives with external partners (Almemari et al., 2021). GHRM practices such as green recruitment and selection, green training and development, green involvement and empowerment, green performance assessment, and green performance-based rewards encourage employees to adopt pro-environmental behaviors (Nisar et al., 2021), which are crucial for sustainable performance (Saifulina et al., 2020; Malik et al., 2021).

Employees' environmental behaviors are voluntary activities that support environmental sustainability within the organization. Employees are the ones who implement the organization's sustainability policies (Dumont et al., 2017a, b). Since employee behaviors often determine the effectiveness of an organization's environmental efforts, there has been increasing interest in understanding how leadership styles influence employee behaviors (Han et al., 2019; Mi et al., 2019). Employees are less likely to engage in proactive, unrewarded environmental behaviors unless they have a strong moral identity (Xiao et al., 2021). Meanwhile, leaders who demonstrate environmental-specific behaviors positively influence their employees' environmental actions (Li et al., 2020). Employees' norms, attitudes, and concerns about sustainability guide their behaviors toward sustainable performance. Environmental attitudes and values shape pro-environmental behaviors, while these behaviors and the perceived benefits to oneself or others are key drivers of sustainable performance (Font and Jones, 2016).

The core idea of Social Cognitive Theory (SCT) revolves around the connection between personal goals, thoughts, and the surrounding environment of employees. According to SCT, Green HRM (GHRM) practices play a significant role in shaping the desired behaviors among employees. Key behavioral elements of SCT, such as self-efficacy, behavioral capability, expectations, observational learning, self-control, and reinforcement, are supported by GHRM practices to foster positive behaviors that lead to sustainable performance.

For instance, green training and development enhance employees' knowledge and skills to carry out environmentally friendly actions, while green involvement and empowerment boost their self-efficacy and confidence in managing situations. Green performance-based rewards and assessments reinforce these environmental behaviors, contributing to sustainable performance. Additionally, green career growth opportunities, green teamwork, and green work-life balance further strengthen sustainable performance by encouraging environmentally conscious behaviors among employees.

Moreover, leadership qualities such as inspirational motivation, intellectual stimulation, and individualized consideration positively impact employees' pro-environmental behaviors, driving them towards sustainability.

2.2. THEORETICAL BACKGROUND

While sustainable performance is gaining attention at both micro and macroeconomic levels, its connection with Green Human Resource Management (GHRM) remains an area of ongoing interest (Yong et al., 2019). Leading organizations worldwide recognize green management and its drivers as crucial elements for long-term success. Committing to sustainable practices not only guides resource allocation but also creates the conditions necessary for continued prosperity. It is increasingly acknowledged that by supporting green initiatives, employees in any organization can contribute to sustainability (Suleman, 2021).

Recently, there has been growing interest in GHRM, highlighting its significant role in promoting sustainable practices and introducing various eco-friendly initiatives (Yu et al., 2020; Rubel et al., 2021). Employees' participation in green activities is vital to the greening of businesses (Shen et al., 2018). GHRM is a powerful tool for encouraging green behaviors, especially when organizations prioritize sustainable performance (Ercantan and Eyupoglu, 2022). The green behavior of employees refers to the pro-environmental actions they take in the workplace (Tian and Robertson, 2019).

Environmental-specific leaders act as role models, reinforcing pro-environmental attitudes and behaviors among employees. These leaders can influence employees' views on green policies and practices by establishing and promoting ethical standards, helping organizations achieve sustainable performance (Peng and Lee, 2019). Although the impact of environmental-specific transformational leadership on employee pro-environmental behavior is well-documented, it is also important to explore how such leadership can enhance sustainable performance by fostering these behaviors (Saleem et al., 2020).

2.3. GHRM PRACTICES AND SUSTAINABLE PERFORMANCE

Green Human Resource Management (GHRM) is an environmental-focused approach to HRM aimed at reducing pollution and ensuring the sustainability of natural resources (Nisar et al., 2021). Numerous studies have identified various GHRM practices and indicators (Shen et al., 2019; Sabiu et al., 2019). Yong et al. (2019) highlighted that green recruitment, green training, green performance appraisal systems, and green rewards are the most widely acknowledged GHRM practices. Key elements include recruiting employees who are aware of green issues, providing training to enhance their green competencies, implementing green performance appraisal standards, and offering green performance-based rewards (Pham et al., 2019; Aboramadan, 2020).

In the present study, seven GHRM practices are emphasized as essential indicators: green recruitment & selection (GR&S), green training & development (GT&D), green involvement & empowerment (GI&E), green performance-based rewards (GPR), green career growth opportunities (GCGO), green teamwork (GT), and green work-life balance (GWLB). These practices were selected for their relevance to the study’s context and objectives, particularly in reinforcing pro-environmental behaviors among employees to achieve sustainable performance (Ari et al., 2020).

The concept of sustainable performance has emerged to address the environmental impact of economic activities by replacing traditional methods with environmentally friendly practices (Bombiak and Marciniuk-Kluska, 2018; Zeeshan-Ullah and Puhakka, 2021). Sustainable performance entails a balance of economic, ecological/environmental, and social performance (Goran et al., 2018). HRM practices play a crucial role in helping organizations achieve their environmental and sustainability goals (Jabbour and Renwick, 2020). Organizations that focus strategically on workforce training to enhance green practices are better equipped to develop green capabilities aimed at minimizing waste and pollution (Amrutha and Geetha, 2020).

2.4. ETL AND SUSTAINABLE PERFORMANCE

Environmental-specific transformational leadership (ETL) is a managerial practice that emphasizes environmental issues and is intended to promote environmentally friendly actions within organizations and among employees (Graves et al., 2013; Robertson, 2018). ETL is characterized by four behavioral components: idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration (Schmitt and Belschak, 2016). The increasing pressure of environmental concerns has pushed organizations to strive for

sustainable performance, necessitating that organizational leaders adopt a proactive approach toward natural ecological systems (Wu and Wang, 2015).

As organizations aim for environmental sustainability and transformation to achieve sustainable performance, there is a growing need for environmental-specific leadership (Vila-Vázquez et al., 2018). According to Jian et al. (2020), environmental-specific leaders are capable of encouraging both internal and external entities to achieve sustainability goals. Compared to other leadership styles, ETL is more deeply concerned with environmental issues and integrates environmental values into all organizational processes to achieve sustainable performance (Su et al., 2020).

Environmental-specific transformational leaders take actions that positively impact the natural environment and, in doing so, act as role models for their followers, who are likely to emulate their leaders' actions (Omarova and Jo, 2022). ETL focuses on motivating followers to participate in job tasks that reduce the negative environmental impacts of organizational operations. By safeguarding environmental quality, ETL can help businesses achieve sustainable performance (Cop et al., 2021).

Dubey et al. (2015) argued that environmental leaders enhance organizational environmental performance and contribute positively to quality management. In addition to environmental aspects, ETL is associated with other organizational outcomes, such as better corporate identity, improved organizational reputation, employee motivation, greater productivity (Kim and Stepchenkova, 2018), increased market performance, and socially responsible financial gains (Su et al., 2020). Sustainable performance and organizational success require transformational leadership with a focus on the environment.

2.5. GHRM PRACTICES AND PEBs OF EMPLOYEES

Pro-environmental behaviors (PEBs) are actions taken by employees to support environmental initiatives and promote environmentally friendly practices within the workplace (Shen et al., 2019; Zhang et al., 2020). These behaviors, also known as employee green behaviors (EGB) or green workplace behaviors (GWB), are essential for organizations to achieve their environmental sustainability goals. PEBs include conscious efforts to reduce the negative effects of business activities on the natural environment, such as minimizing paper use, avoiding electricity wastage, and recycling materials (Ones et al., 2015). In the context of the dairy industry, this study focuses on three specific PEBs: in-role environmental behavior, extra-role environmental behavior (Dumont and Deng, 2016), and green innovative work behavior (Aboramadan, 2020).

2.6. ETL AND EMPLOYEES' PEBs

Environmental-specific transformational leadership (ETL) emphasizes sustainable development by incorporating environmental values among employees and translating organizational sustainability objectives into self-driven environmental behaviors (Robertson, 2018). ETL is a specific manifestation of transformational leadership, where leaders focus on fostering pro-environmental initiatives and encouraging green behaviors within the organization (Marashdah and Albdareen, 2020). This leadership style drives pro-environmental behaviors (PEBs) by instilling a green vision among employees and motivating them to engage in environmentally conscious actions at work.

2.7. EMPLOYEES' PEBs AND SUSTAINABLE PERFORMANCE

The challenge of sustainable development is deeply intertwined with human behaviors towards the environment, as these behaviors directly impact the success of environmental initiatives

(Thondhlana and Hlatshwayo, 2018). Scholars and policymakers argue that promoting pro-environmental behaviors (PEBs) among employees is a crucial strategy for addressing environmental issues (Dornhoff et al., 2019). PEBs are fundamental for transforming organizational sustainable development strategies into actionable practices. Employees who engage in environmentally friendly behaviors actively contribute to sustainable performance by reducing pollution, enhancing efficiency, and engaging in activities like recycling used materials (Yusliza et al., 2020).

Employees exhibiting PEBs often gravitate towards low-cost, renewable energy projects and other initiatives that reduce environmental costs, ultimately boosting economic performance and contributing to the triple bottom line of sustainability, which includes economic, environmental, and social dimensions. For instance, PEBs may lead to eco-friendly procurement practices and the effective communication of environmental strategies with external partners, thereby increasing market share and economic gains (Ramus and Montiel, 2005).

2.8. GHRM PRACTICES, PEBs OF EMPLOYEES AND SUSTAINABLE PERFORMANCE (MEDIATION)

The literature on Green Human Resource Management (GHRM) reveals two main perspectives on how it influences sustainable performance:

1. **Integration of HRM Practices**: The first perspective views GHRM as a collection of traditional HRM practices adapted for sustainability. This includes recruitment and selection, training, performance appraisal, and reward policies, all structured to support sustainable performance (Jabbour and Jabbour, 2015).

2. **Behavioral Shaping**: The second perspective argues that merely integrating HRM practices with an environmental management system is insufficient. It emphasizes the need to actively shape employees' behaviors towards sustainability (Ehnert, 2009).

These two perspectives highlight the interplay between GHRM practices, environmental behaviors, and sustainable development (Khan and Muktar, 2020). Koberg and Longoni (2018) assert that to protect the environment and achieve sustainable development, organizations must encourage employee participation in pro-environmental practices (Jabbour and Renwick, 2020). GHRM practices such as training, employee involvement, and environmental performance-based rewards are designed to foster environmental behaviors among employees, helping to mitigate global issues like climate change and resource crises (Zibarras and Coan, 2015; Huo et al., 2020).

Empirical evidence supports that GHRM practices are positively linked with both sustainable development and employees' environmental behaviors (Jehan et al., 2020; Ari et al., 2020). While many studies focus on environmental behavior as the final outcome of GHRM practices, Li et al. (2020) suggest that the ultimate goal should be to enhance organizational performance through the development of environmental behaviors. This involves considering how pro-environmental behaviors (PEBs) influence social, financial, and environmental performance.

Addressing this gap, the present study hypothesizes that:

****H6.** Employees' pro-environmental behaviors (PEBs) mediate the relationship between GHRM practices and sustainable performance.**

2.9. ETL, PEBs OF EMPLOYEES AND SUSTAINABLE PERFORMANCE (MEDIATION)

The role of transformational leaders, particularly those with an environmental-specific focus, is increasingly recognized in fostering environmental behavior among employees to achieve sustainable performance. Environmental-specific transformational leadership (ETL) plays a crucial role in this context by instilling long-term sustainable practices and encouraging self-driven pro-environmental behaviors (Jennifer Robertson, 2018).

2.10 MODERATING INFLUENCE OF PRO ENVIRONMENTAL ATTITUDE

Pro-environmental attitude (PEA) reflects an individual's tendency to act responsibly toward the environment, and it plays a significant role in influencing workplace pro-environmental behaviors (PEBs). This is consistent with the Theory of Planned Behavior (Ajzen, 1991), which posits that attitudes shape behaviors. Research supports that individuals with a strong environmental concern are more inclined to engage in protective actions (Hinds and Sparks, 2008).

PEA is influential in several ways:

1. **Influence on Workplace Behaviors**: People with a pro-environmental attitude tend to exhibit PEBs, which are shaped by their environmental attitudes (Bamberg and Moser, 2007; Bissing-Olson et al., 2013).

2. **Role of Leaders**: Leaders who demonstrate a pollution-averting attitude are likely to inspire their employees to engage in environmental protective behaviors through intellectual stimulation and idealized influence (Cordano and Frieze, 2000).

3. **Link with GHRM Practices**: PEA is positively associated with GHRM practices (Opatha and Kottawatta, 2020), as these practices are designed to align employee behavior with environmental goals.

4. **Effect of ETL**: Environmental-specific transformational leadership (ETL) can cultivate a strong environmental attitude among employees, which further enhances their pro-environmental behaviors (Khuwaja et al., 2020).

Given these insights, the current study proposes that PEA serves as a moderator in the relationship between GHRM practices, ETL, and PEBs. The hypotheses are:

****H8.** PEA positively moderates the impact of GHRM practices on PEB, with a stronger effect when PEA is high compared to when it is low.**

****H9.** PEA positively moderates the impact of ETL on PEB, with a stronger effect when PEA is high compared to when it is low.**

2) RESEARCH METHODOLOGY

3.1. METHODS

This quantitative study, aligned with a positivist paradigm, followed a deductive and explanatory approach to explore the causal relationships between constructs (Creswell, 2013). The research was cross-sectional, using a survey questionnaire to gather data from employees in Pakistan's dairy organizations. Ten dairy product manufacturing companies in five districts of Punjab province were randomly selected for data collection. The districts chosen—Sahiwal, Faisalabad, Lahore, Multan, and Rawalpindi—were selected because dairy organizations in these areas have both horizontal and vertical integration units (Khan et al., 2020). AjmalLi and Aslam (2016) also focused on these districts in their study of Pakistan’s dairy sector.

The study emphasized the importance of considering factors like multivariate normality, missing data, model complexity, estimation methods, and the average variance error of reflective factors when determining the sample size (Hair et al., 2010). To ensure an adequate sample size for multivariate data analysis (SEM), we followed a sampling formula: the number of items or statements multiplied by 5, as recommended by Hair et al. (2014). With 82 elements in the study constructs, a sample size of 410 was required. To account for nonresponse bias, 820 questionnaires were distributed.

Before collecting data, an invitation letter was sent to the HR departments of the selected organizations to obtain approval and request participant referrals. Due to COVID-19 and the rotation policy for employees, an online survey was considered the most suitable method for gathering responses. Data collection occurred between February 2020 and May 2020. Out of the 820 questionnaires distributed across the ten organizations, 549 responses were received, yielding a 67% response rate. After cleaning the data and removing outliers, 430 responses were deemed valid for analysis.

3.2. VARIABLES AND MEASURES

The multi-item measurement tools used in this study were validated in earlier research. The constructs were assessed using a 10-point scale, with 1 indicating "strongly disagree" and 10 indicating "strongly agree." The study discusses the scale development or adoption process based on various methodological and statistical analyses. Specifically, the SAFE (Scale Adoption Framework for Evaluation) approach was used to develop or adopt the scales, focusing on key aspects like defining the construct, linking it to relevant theory, and ensuring scale validation and reliability (K. Green et al., 2008).

For instance, the scale for Green Human Resource Management (GHRM) practices covered seven dimensions: green recruitment and selection (GR&S), green training and development (GT&D), green involvement and empowerment (GI&E), green performance-based rewards (GPR), green career growth opportunities (GCGO), green teamwork (GT), and green work-life balance (GWLB). Tang et al. (2017) developed scales to measure GR&S (3 items), GT&D (3 items), GPR (7 items), and GI&E (5 items). A four-item scale from Muster and Schrader (2011) was adapted to measure GWLB.

Career growth opportunities are a crucial part of GHRM practices (Ren et al., 2018), but many previous studies did not include it (Yong et al., 2019; Pham et al., 2019). To measure GCGO in this study, a scale by Hirschi et al. (2018) was adapted, adding the term ‘GHRM practices’ to three items to fit the green context. The Team Effectiveness Audit Tool (TEAT) developed by Bateman and Bingham (2002) was modified to assess the productivity of green teamwork in this study.

A five-item scale by Graves et al. (2013) was used to evaluate Ethical Transformational Leadership (ETL). The Pro-Environmental Behavior (PEB) construct included three dimensions: in-role, extra-role, and innovative environmental behaviors. In-role and extra-role behaviors were measured using a scale by Bissing-Olson et al. (2013), with three items for each dimension. Innovative environmental behavior was measured using a five-item scale developed by Scott and Bruce (1994). The pro-environmental attitude was assessed with the 15-item New Ecological Paradigm (NEP) Scale by Dunlap and Van Liere (1978).

Sustainable performance was measured across three dimensions: environmental, economic, and social performance. Environmental performance was measured using eight items, with contributions from Zhu et al. (2013), Longoni and Guerci (2018), Rawashdeh (2018), and Alkerdawy (2018). Economic performance was assessed with three items from W. Green et al.

(2008) and four items from Longoni and Guerci (2018), Rawashdeh (2018), Zhu et al. (2022), and Zaid et al. (2018). Social performance was measured using five items, drawing on work by Zaid et al. (2018) and Rawashdeh (2018).

STATISTICAL CONTROL VARIABLES

This study accounted for participants' experience and qualifications during data analysis because these factors might influence environmental behavior and sustainable performance. For instance, participants with higher experience and qualifications are likely to have a stronger pro-environmental attitude and a better understanding of sustainable performance. As a result, the relationship between experience, qualifications, and these variables may be stronger among participants in higher positions and with more advanced qualifications.

To ensure the validity of the measurement tool, a pretest was conducted. Three HRM experts were asked to evaluate the content validity, face validity, flow of scale items, wording, and format. Based on their feedback, minor adjustments were made to the questionnaire. A pilot test was then conducted with 50 respondents to further verify the validity and internal consistency. Respondents were asked to think aloud and provide feedback to ensure that both the researcher and participants interpreted the instrument in the same way. The pilot test results confirmed the validity and reliability of the measuring instrument. The Cronbach's alpha values for the scales were as follows: GHRM (0.93), ETL (0.88), PEB (0.89), pro-environmental attitude (0.91), and sustainable performance (0.94).

3.3 COMMON METHOD BIASES

Common method variance (CMV) can occur when self-reported data is collected from the same group of respondents, which may introduce bias (Podsakoff and Organ, 1986). In this study, since cross-sectional data was gathered from the same respondents for both dependent and independent variables, Harman’s single-factor test was used to assess the presence of CMV. A principal component analysis (PCA) was performed on all items in the measurement instrument, which extracted nine factors with eigenvalues greater than 1, accounting for 56.37% of the total variance. The first unrotated factor explained only 39.11% of the variance. Since this single factor accounts for less than 50% of the variance, it indicates that common method bias is unlikely to be a significant issue in the data.

3) **DATA ANALYSIS AND RESULTS**

4.1. DEMOGRAPHIC DATA OF THE PARTICIPANTS

A total of 430 valid responses were included in the data analysis. The demographic characteristics of the respondents were assessed based on gender, age, qualification, and experience. Of the 430 participants, 76% (327) were male, and 24% (103) were female. Regarding age, 35% (152) of the participants were under 30 years old, 49% (211) were aged between 31 and 40, 10% (45) were between 41 and 50, and only 5% (22) were over 50 years old.

In terms of qualifications, 45.8% (197) of the participants held bachelor’s degrees, 53.25% (229) had master’s degrees, and only 1% (4) had a Ph.D. Concerning work experience, the majority of participants, 25.6% (110) and 38.1% (164), had 1–5 years and 6–10 years of experience, respectively. Additionally, 15.6% (67) had up to 1 year of experience, 11.6% (50) had 11–15 years, another 11.6% (50) had 16–20 years, and 9.1% (39) had over 20 years of experience in the dairy industry (see Table 1).

4.2. NON-RESPONSE BIAS TEST

To assess non-response bias, we conducted a paired-sample t-test using IBM SPSS 25. The total sample of 430 respondents was divided into two groups: 215 early respondents and 215 late respondents. The p-values for all variables were found to be non-significant for both early and late responses, indicating no significant differences between the two groups. This suggests that there is no significant difference between those who responded and those who did not. As a result, it was not necessary to collect additional data, and the research model was analyzed using the available dataset. The findings can therefore be considered generalizable to the broader population.

4.3. ENDOGENEITY TEST

Endogeneity has been widely discussed in business research, particularly concerning various regression and panel models (Ebbes et al., 2011; Park and Gupta, 2012; Rossi, 2014). However, few studies address endogeneity in multivariate SEM (Structural Equation Modeling) data analysis. Conversely, some research has focused on endogeneity in factor-based SEM (Bollen et al., 2014; Kirby and Bollen, 2009). Endogeneity issues can arise from several sources, including common method variance, measurement error, simultaneous causality, and latent heterogeneity (Papies et al., 2016; Sande and Ghosh, 2018). These issues often stem from omitted variables that are correlated with one or more independent and dependent variables in the regression model (Rossi, 2014). When these variables are omitted, they can create associations between the error terms of the corresponding independent and dependent variables (Wooldridge, 2015). This problem can lead to exogenous variables incorrectly explaining the variance in the dependent variable, introducing errors into the model.

Table 1

Demographic profile of respondents

Sr. No.	Demographics	Respondents	%
1	Gender	327	76
	Male	103	24
	Female		
2	Age	152	35
	Below 30	211	49.5
	31----------40	45	10.5
	41----------50	22	5
	Above 50		
3	Qualifications	197	45.8
	Bachelors	229	53.2
	Masters	4	1
	PhD.		
4	Experience	110	25.6

	1-------5 years	164	38.1
	6-------10 years	67	15.6
	11------15 years	50	11.6
	16------20 years	39	9.1
	Above 29 years		

Table 2

Non-response bias test

Variable	Response	N	Mean	Std. Deviation	t-statistics	Sig. (2-tailed)
GHRM	Early	430	9	0.8	-1.1	.1
	Late	430	8.7	1	-0.5	.5
ETL	Early	430	8.8	0.9	0.2	.9
	Late	430	9.2	0.8	0.9	.3
PEB	Early	430	9	0.8	0.4	.6
	Late	430	8.9	0.9	-1.1	.2
PEA	Early	430	8.7	1	1.2	.2
	Late	430	8.9	0.9	-0.2	.9
SP	Early	430	9	0.85	1.1	.2
	Late	430	9.2	0.81	-0.6	.5

One straightforward way to address or reduce endogeneity is by including a set of control variables (Bernerth and Herman, 2016). However, the selection or inclusion of control variables often does not fully resolve endogeneity issues (Papies et al., 2016). Therefore, in addition to selecting control variables, it is necessary to apply a statistical approach to address endogeneity. One such method is the Instrumental Variable (IV) approach (Papies et al., 2016).

Applying this approach requires identifying an IV that is correlated with the variables of interest, such as GHRM and ETL, but uncorrelated with the omitted variables affecting sustainable performance. This ensures that the IV is not associated with the error term in the Pro-Environmental Behavior (PEB) model. In this study, experience was used as an IV in the IV approach. The weak identification (WeakID) test was employed to compare the R^2 value from the first stage of the analysis with and without the IV. As shown in Table 4, the inclusion of the IV significantly increased the R^2 value in the first stage when GHRM and ETL were treated as endogenous, as indicated by WeakID test values exceeding the threshold value of 10. Additionally, the Wu-Hausman test yielded a p-value of 0.211. The Gaussian curve presented in Table 3 suggests that the findings are consistent with previous research that both theoretically and empirically confirms the endogeneity issue concerning PEB and sustainable performance.

Thus, the results indicate that empirical endogeneity does not significantly affect the conclusions drawn from our model, aligning with theoretical perspectives (Hult et al., 2018) (see Table 5).

4.4. ANALYTICAL APPROACH

Structural Equation Modeling (SEM) was employed for data analysis, following a two-step model development process as recommended by Hair et al. (2014). In the first step, Confirmatory Factor Analysis (CFA) was conducted to validate the measurement model. In the second step, the structural model was developed to test the hypotheses and determine the causal path coefficients. By combining both the measurement and structural models in a single analysis, SEM provides a more comprehensive method for empirically testing theoretical models (Hair et al., 2014). Additionally, SEM allows for the simultaneous examination of mediation effects, which is more efficient than conducting individual regression analyses for each mediation pathway (Sarstedt & Hwang, 2020).

4.4.1. CONSTRUCT VALIDITY AND RELIABILITY

Confirmatory Factor Analysis (CFA) was conducted to validate the measurement model by evaluating the unidimensionality, reliability, and validity of the constructs. To ensure unidimensionality, each measured variable should be associated with only one construct, and the factor loadings of the items for their respective constructs should be above 0.60 (Hair et al., 2014). The reliability of the measurement model was assessed using composite reliability (CR). Convergent validity was confirmed by calculating the average variance extracted (AVE), which reflects the average percentage of variance explained by the latent constructs in relation to the measurement model items. The structural validity was confirmed when the model's fitness indices met the required criteria.

Different SEM programs may use slightly different fitness indices, but it is recommended to include at least one fitness index for each category of models (Hair et al., 2017). In this study, the model's fitness was evaluated using ChiSq/df values, RMSEA, CFI, TLI, and NFI. For a good fit, CFI, TLI, and NFI values should be above 0.90, with a p-value < 0.005, while RMSEA values up to 0.08 are considered acceptable.

Overall, the measurement model in this study showed a good fit with ChiSq/df = 1.828; ($\chi 2$ = 206.521/df. = 113), $p < 0.001$, RMSEA = 0.048, CFI = 0.971, TLI = 0.966, and NFI = 0.939 (Hair et al., 2014). However, six items related to GHRM practices (GPR1, GPR6, GI&E4, GT4, GT5, GT6), four items related to sustainable performance (ECOP1, ECOP7, ENP3, ENP8), and three items related to pro-environmental attitude (PEA6, PEA9, PEA15) were removed due to discrepancies in the model fit.

Table 3

Results of Gaussian copula approach

Original Model	Gussian copula Model 1 (endogenous variables: GHRM)	Gussian copula Model 2 (endogenous variables: ETL)	Gussian copula Model 3 (endogenous variables: PEB)

Variable	Value	p-value	Value	p-value	Value	p-value	Value	p-value
GHRM	0.3	< 0.01	0.3	< 0.01	0.3	< 0.01	0.3	< 0.01
ETL	0.4	< 0.01	0.4	< 0.01	0.4	< 0.01	0.4	< 0.01
PEB	0.5	< 0.01	0.5	< 0.01	0.5	< 0.01	0.5	< 0.01
cGHRM			0.007	0.876	0.032	0.4	0.042	0.076
cETL								
cPEB								

Gussian copula Model 4 (endogenous variables: GHRM, ETL)			Gussian copula Model 5 (endogenous variables: GHRM, PEB)		Gussian copula Model 6 (endogenous variables: ETL, PEB)		Gussian copula Model 7 (endogenous variables: GHRM, ETL, PEB)	
Variable	Value	p-value	Value	p-value	Value	p-value	Value	p-value
GHRM	0.3	0.00	0.3	0.00	0.3	0.00	0.3	0.00
ETL	0.4	0.00	0.4	0.00	0.4	0.00	0.4	0.00
PEB	0.5	0.00	0.5	0.00	0.5	0.00	0.5	0.00
cGHRM	0.017	0.7	0.008	0.6			0.042	0.456
cETL	0.039	0.2			0.039	0.4	0.02	0.51
cPEB			0.042	0.08	0.051	0.06	0.04	0.06

Table 4

Results of IV approach

Endogenous variable	Co-efficient			R2 Values		WeakID test		Wu-Hausman test
	GHRM	ETL	PEB	First stage without IV	First stage with IV	F-value	Significant	p-value
GHRM	0.07	0.5	0.4	0.49	0.57	49.5	Yes	0.211
ETL	0.12	0.2	0.4	0.43	0.57	87.7	Yes	0.211

PEB	0.08	0.08	1.2	0.29	0.57	16.6	yes	0.211

Table 2 shows that all factor loadings are above 0.60, AVE is greater than 0.50, and CR is above 0.60, meeting the thresholds recommended by Fornell and Larcker (1981). Discriminant validity was assessed by taking the square root of the AVE values. To confirm discriminant validity, the correlation between constructs should not exceed 0.85 (Kline, 2017). As shown in Table 6, the discriminant validity values are higher than the correlations between constructs and remain below 0.85, indicating that the measurement model's elements are not redundant.

4.4.2. DATA ANALYSIS

The Variance Inflation Factor (VIF) values were assessed, ranging from 1.112 to 1.866, which is well below the threshold level of 3.0. This indicates that multicollinearity is not a concern in the model (see Table 6 and Fig. 1). The analysis of the structural model demonstrated that the model fit indices are within acceptable ranges, with ChiSq/df = 1.828, a probability value of 0.000, RMSEA = 0.048, CFI = 0.972, NFI = 0.939, RFI = 0.927, and TLI = 0.966.

The proposed hypotheses (H1-H5) were tested, with the results presented in Table 4. All hypotheses were supported except for H2. Specifically, Green Human Resource Management (GHRM) practices were found to have a significant positive impact on sustainable performance ($\beta = 0.216$, $p < 0.028$). Both GHRM practices ($\beta = 0.256$, $p < 0.000$) and Environmental Transformational Leadership (ETL) ($\beta = 0.544$, $p < 0.000$) showed a statistically significant relationship with Pro-Environmental Behavior (PEB). Additionally, PEB had a significant positive effect on sustainable performance ($\beta = 0.512$, $p < 0.013$). However, the effect of ETL on sustainable performance ($\beta = 0.301$, $p < 0.087$) was not statistically significant, leading to the rejection of H2 (see Fig. 2).

4.4.2.1. MEDIATION TEST

The Bootstrapping Maximum Likelihood Estimation (MLE) method, with 1,000 bootstrap samples and a 95% confidence interval, was used to assess the mediational effect of Pro-Environmental Behavior (PEB). The analysis revealed that the direct effect of Green Human Resource Management (GHRM) practices on sustainable performance is significant ($\beta = 0.216$, $p < 0.028$), and the indirect effect is also significant ($\beta = 0.256 * 0.512 = 0.131$, $p < 0.005$). This indicates that H6 is supported, showing that PEB partially mediates the relationship between GHRM practices and sustainable performance.

For Environmental Transformational Leadership (ETL), the direct effect on sustainable performance was not significant ($\beta = 0.301$, $p < 0.087$), but the indirect effect was significant ($0.544 * 0.521 = 0.283$, $p < 0.005$). Therefore, H7 is supported, indicating that PEB fully mediates the relationship between ETL and sustainable performance (see Table 7).

4.4.2.2 MODERATION TEST

The moderation effects were tested using interaction effects in SPSS.

For the first moderation effect, we examined the impact of Green Human Resource Management (GHRM) practices and Pro-Environmental Attitude (PEA) on Pro-Environmental Behavior (PEB). The direct effect of GHRM practices on PEB was significant ($F = 11.867$, $p < 0.001$), and the interaction between GHRM practices and PEA (GHRM practices x PEA) was also significant ($\beta = 0.119$, $t = 2.329$, $p < 0.05$). To explore these interactions further, we divided the moderator variable into low and high groups using dummy variables, as suggested by Aiken and West (1991).

At high levels of PEA, GHRM practices positively influenced PEB ($\beta = 0.234$, $t = 4.192$, $p < 0.001$). Conversely, at low levels of PEA, GHRM practices had a negative impact on PEB ($\beta = -0.176$, $t = -3.159$, $p < 0.001$). The difference between the slopes for low and high PEA was significant ($t = 3.79$, $p < 0.001$), supporting H8.

For the second moderation effect, we investigated the effects of Environmental Transformational Leadership (ETL) and PEA on PEB. The direct effect of ETL on PEB was significant ($F = 12.543$, $p < 0.001$), and the interaction effect between ETL and PEA (ETL x PEA) was also significant ($\beta = 0.101$, $t = 2.007$, $p < 0.05$). We divided the moderator variable into low and high groups to analyze the interactions further.

Table 5

Factor Loadings, AVE and CR values

Construct	Sub-dimension	Indicator	Factor loading	AVE > 0.5	CR > 0.6
GHRM practices	GR&S	GR&S 1	0.87	0.74	0.89
		GR&S 2	0.91		
		GR&S 3	0.81		
	GT&D	GT&D 1	0.83	0.65	0.84
		GT&D 2	0.94		
		GT&D 3	0.63		
	GPR	GPR 2	0.86	0.66	0.90
		GPR 3	0.85		
		GPR 4	0.68		
		GPR 5	0.81		
		GPR 7	0.87		
	GI&E	GI&E 1	0.87	0.81	0.94
		GI&E 2	0.94		
		GI&E 3	0.93		
		GI&E 5	0.86		
	GWLB	GWLB 1	0.81	0.66	0.88
		GWLB 2	0.93		
		GWLB 3	0.86		
		GWLB 4	0.62		
	GCGO	GCGO 1	0.73	0.71	0.88

		GCGO 2	0.94		
		GCGO 3	0.86		
	GT	GT 1	0.81	0.59	0.81
		GT 2	0.86		
		GT 3	0.62		
ETL		ETL 1	0.77	0.71	0.92
		ETL 2	0.72		
		ETL 3	0.89		
		ETL 4	0.95		
		ETL 5	0.88		
PEB	In role behavior	INRol 1	0.94	0.81	0.93
		INRol 2	0.91		
		INRol 3	0.86		
	Extra role behaviour	EX 1	0.86	0.75	0.90
		EX 2	0.81		
		EX 3	0.93		
	Innovative Env. Behavior	INN 1	0.75	0.60	0.88
		INN 2	0.81		
		INN 3	0.75		
		INN 4	0.76		
		INN 5	0.82		
Sustainable Performance	Eco. Performance	ECOP 2	0.92	0.80	0.95
		ECOP 3	0.91		
		ECOP 4	0.92		
		ECOP 5	0.88		
		ECOP 6	0.84		
	Env. Performance	ENP 1	0.88	0.66	0.92

		ENP 2	0.87		
		ENP 4	0.86		
		ENP 5	0.72		
		ENP 6	0.79		
		ENP 7	0.77		
	Social Performance	SP 1	0.78	0.87	0.91
		SP 2	0.82		
		SP 3	0.81		
		SP 4	0.87		
		SP 5	0.81		
Pro-environmental Attitude		PEA 1	0.82	0.72	0.96
		PEA 2	0.76		
		PEA 3	0.88		
		PEA 4	0.86		
		PEA 5	0.89		
		PEA 7	0.88		
		PEA 8	0.96		
		PEA 10	0.82		
		PEA 11	0.76		
		PEA 12	0.78		
		PEA 13	0.88		

Table 6

Discriminant Validity

Construct	Mean	SD	VIF	GHRM	PEA	ETL	PEB	SP
GHRM	8.88	0.91	1.40	0.80				
PEA	8.83	0.82	1.86	0.44	0.84			
ETL	9.07	0.80	1.11	0.62	0.66	0.84		

PEB	8.77	0.92	1.72	0.66	0.52	0.52	0.71	
SP	8.75	0.87	1.12	0.68	0.72	0.32	0.55	0.88

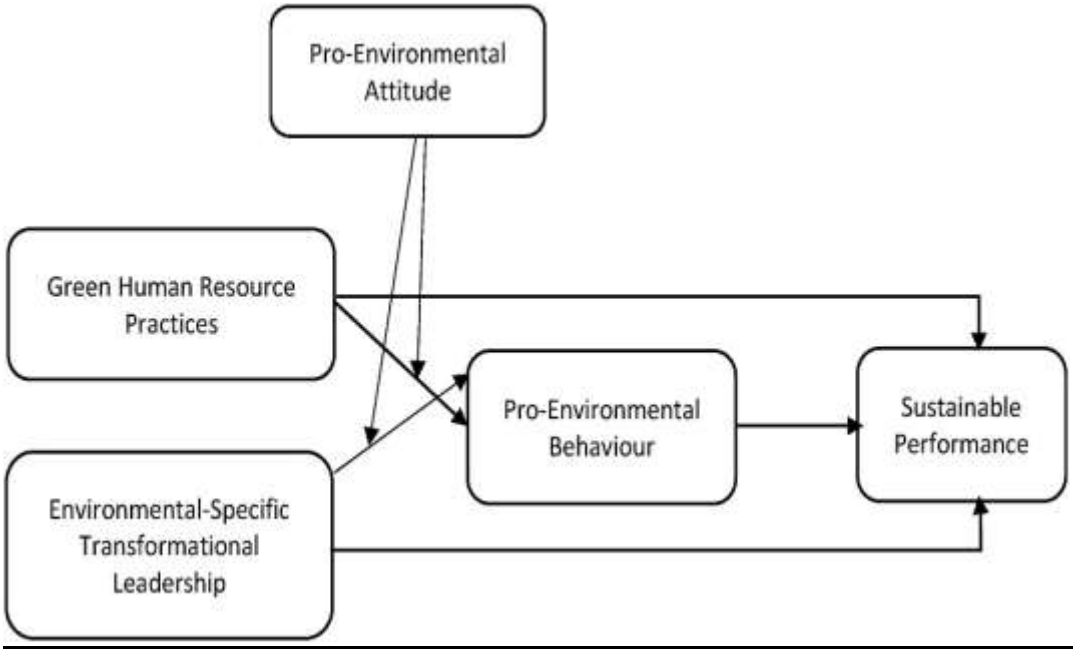

Fig. 1. Conceptual Framework of the Study

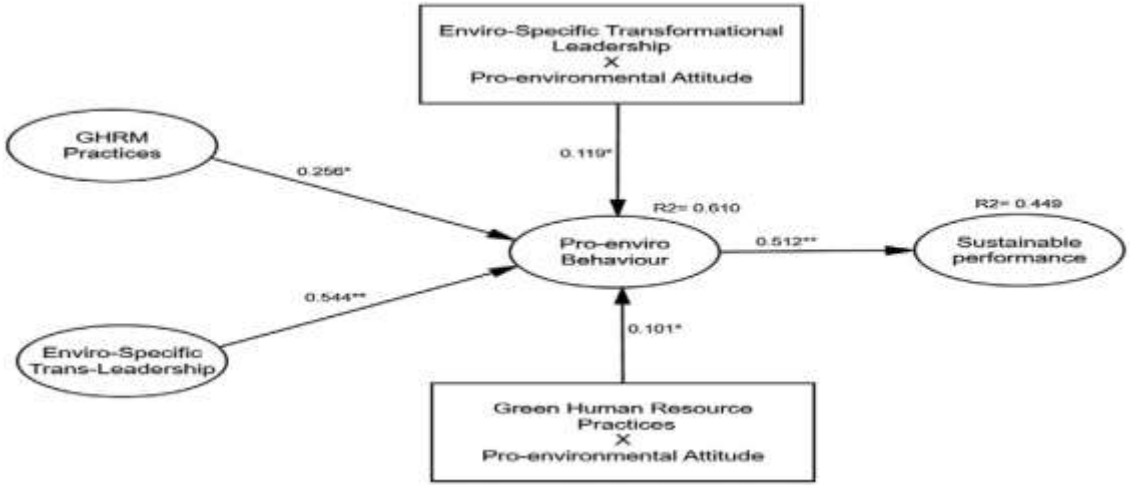

Fig. 2. Confirmation of the research model

Table 7

Structural model and path coefficients

Hypothesis	Estimation	S.E.	C.R.	p-Value	Decision
GHRM--- Sustainable Performance	0.21	0.09	2.2	0.02	Supported
ETL---Sustainable Performance	0.30	0.17	1.7	0.08	Not Supported
GHRM---PEB	0.25	0.06	4.1	***	Supported
ETL---PEB	0.54	0.09	5.8	***	Supported
PEB---Sustainable Performance	0.51	0.20	2.4	0.01	Supported

ETL had a positive effect on PEB at high levels of PEA ($\beta = 0.213$, $t = 4.158$, $p < 0.001$) but a negative effect at low levels of PEA ($\beta = -0.165$, $t = -3.427$, $p < 0.001$). The difference between the slopes for low and high PEA was significant ($t = 4.711$, $p < 0.001$), supporting H9.

4) DISCUSSION

This study explored how Green HRM (GHRM) practices and environmental-specific transformational leadership impact sustainable performance in the Pakistani dairy industry. It also looked at how employee pro-environmental behavior (PEB) and pro-environmental attitude (PEA) play roles in this relationship. The study supported the initial hypothesis that GHRM practices positively influence sustainable performance. The results matched previous research, indicating that integrating green practices into HRM policies is crucial for achieving sustainable performance.

Organizations should focus on eco-friendly recruitment, selection, and training programs. Employees should be encouraged to adopt green behaviors by linking these behaviors to performance evaluations and rewards. Creating and maintaining green teams can motivate employees to balance work and environmental responsibility, promoting pro-environmental behaviors. Implementing green HRM practices improves an organization's environmental, economic, and social outcomes, contributing to overall sustainable performance.

The second hypothesis explored whether environmental-specific transformational leadership affects sustainable performance. The results showed that this leadership style did not have a significant direct impact on financial, economic, or social performance. This finding is consistent with previous research, which suggests that while such leadership might not directly influence performance, it can still promote pro-environmental behaviors among employees.

The third hypothesis examined the relationship between GHRM practices and employee pro-environmental behavior. The results confirmed that GHRM practices positively affect employees' environmental behaviors, aligning with previous studies. Organizations that adopt green recruitment, training, performance assessments, and rewards are more likely to foster pro-environmental behaviors among their employees.

Additionally, the hypothesis regarding the link between environmental-specific transformational leadership and pro-environmental behavior showed a positive effect. This

supports earlier findings that leaders who emphasize environmental values can encourage employees to engage in environmentally friendly behaviors.

Finally, the study found that pro-environmental behavior significantly impacts sustainable performance. Employees who practice environmentally friendly behaviors contribute to long-term financial, economic, and social success. Pro-environmental behavior partially mediates the relationship between GHRM practices and sustainable performance, meaning that while GHRM practices directly affect performance, pro-environmental behavior also plays a role in this relationship. The study found that pro-environmental behavior fully mediates the relationship between environmental-specific transformational leadership and sustainable performance. This means that environmental-specific transformational leadership alone does not significantly impact sustainable performance directly; instead, it influences sustainable performance through its effect on pro-environmental behavior.

The study also examined the moderating role of Pro-Environmental Attitude (PEA), which reflects a person's commitment to environmental responsibility. It was found that a higher level of PEA enhances the positive impact of GHRM practices on pro-environmental behavior. Similarly, PEA strengthens the effect of environmental-specific transformational leadership on pro-environmental behavior.

Furthermore, civil society plays a crucial role in environmental governance and policy implementation. Nongovernmental organizations (NGOs) and community groups are key advocates for environmental issues, raising awareness and pushing for policy changes. They often engage in campaigns and debates, contribute to the national agenda on sustainability, and help revise environmental laws. NGOs also provide essential knowledge and training to organizations, communities, and policymakers, helping to increase awareness and adaptability in sustainable development.

5.1. THEORETICAL IMPLICATIONS

The current study has both theoretical and practical implications. Theoretically, it makes a significant contribution to the field of organizational sustainability by examining four key areas: Green HRM (GHRM) practices, environmental-specific transformational leadership, pro-environmental behavior (PEB), and sustainable performance.

This research adds value by addressing a gap in the literature. While previous studies have looked at GHRM practices and environmental-specific transformational leadership separately as predictors of sustainable performance, this study explores their combined effects and their impact on encouraging employees' PEBs. It fills a void by examining how these factors interact to promote sustainable performance, particularly in the context of the Pakistani dairy industry, which has been underrepresented in research.

Additionally, the study highlights the importance of GHRM practices in emerging Asian countries, where this approach is relatively new. It suggests that while GHRM practices are known to influence sustainable performance, their impact may vary across different cultural contexts. Thus, similar studies in other emerging and developed countries could provide further insights.

The study also enriches the understanding of how GHRM and environmental-specific transformational leadership affect sustainable performance by incorporating mediating and moderating factors. Specifically, it shows that pro-environmental behavior partially mediates the relationship between GHRM practices and sustainable performance, and pro-environmental attitude enhances this effect.

In summary, this research provides valuable empirical evidence and theoretical insights into how GHRM practices and environmental-specific transformational leadership can be effectively used to boost sustainable performance. It underscores the importance of integrating pro-environmental behavior and attitude into the sustainability framework.

5.2. PRACTICAL IMPLICATIONS

This study offers practical advice for enhancing the sustainability of dairy organizations by integrating green HRM practices and environmental-specific transformational leadership. Managers can leverage these insights to foster employee engagement and encourage environmentally friendly behaviors.

To improve sustainability, dairy organizations should focus on incorporating green HRM practices, which enhance environmental, social, and economic performance. Considering the environmental impacts of dairy farming—such as resource depletion and pollution—organizations need to revise their leadership and HR strategies. This includes:

- Hiring individuals who support sustainability goals.

- Providing training that educates employees about resource conservation, waste reduction, and recycling.

- Offering career development opportunities and rewards based on green performance to stimulate eco-friendly behaviors.

- Establishing green teams to implement and manage environmental strategies.

- Creating a green work-life balance that aligns professional and personal values towards sustainability.

Leaders play a crucial role by promoting environmental sustainability through:

- Encouraging innovation and creative solutions for environmental issues.

- Instilling environmental values and fostering a collective approach to sustainability among employees.

The study also highlights the importance of employees' pro-environmental attitudes in enhancing the effectiveness of GHRM practices and transformational leadership. This suggests that:

- Hiring employees who are passionate about sustainability goals is beneficial.

- Implementing green practices and leadership can effectively instill pro-environmental behaviors.

Although this study focuses on the dairy sector in Pakistan, the integrated model of GHRM practices and environmental leadership can be applied to various sectors and regions. While cultural differences may influence outcomes, the core principles of green workforce management and leadership are universally applicable.

5.3. LIMITATIONS FOR FUTURE RESEARCH

This study has several limitations. First, it focused specifically on the dairy sector in relation to sustainable performance. Future research could broaden the scope to include the entire agriculture sector. Second, while this study examined internal mechanisms for achieving sustainable performance, future work should explore the effects of forward and backward

integration strategies. Third, the study relied solely on quantitative data collection methods. Employing a mixed-method approach in future research could provide a more comprehensive understanding of the topic. Additionally, investigating the impact of customer green awareness could be valuable. Lastly, applying the study's conceptual framework to different industries and settings could enhance its generalizability.

5) CONCLUSIONS

Green HR practices, including green job analysis and descriptions, green talent acquisition, environmental training, performance assessments, incentives, green teams, and green work-life balance, all play a crucial role in achieving sustainable organizational performance. This study makes a significant contribution to the literature on sustainable performance, particularly within Pakistan's dairy industry, and suggests that similar investigations could be conducted in other countries' dairy sectors. The findings show that Green HRM practices have a significant impact on employees' pro-environmental behavior (PEB) and sustainable performance. Recruiting dedicated staff, providing training, and offering performance rewards aligned with sustainability goals foster PEB among employees. Forming green teams, encouraging employee participation, and establishing a green work-life balance further promote environmental behaviors and sustainable performance. Additionally, environmental-specific transformational leadership positively affects employees' environmental behavior, enhancing social, economic, and environmental outcomes. Overall, the study demonstrates that both Green HRM practices and environmental-specific transformational leadership support employees' pro-environmental behaviors, leading to improved sustainable performance, with pro-environmental attitudes also having a positive influence on environmental behaviors.

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