

## **The Influence of Green Innovation on the Performance of an Organization: The Mediating Effects of GHRM**

Marwat Khan

Professor, CECOS University of IT and Emerging Sciences,

Peshawar. Email: [marwat@cecos.edu.pk](mailto:marwat@cecos.edu.pk)

Received 29 August 2025 Accepted 12 November 2025 Published 20 November 2025

### **Abstract**

Achieving green growth objectives requires collective effort from society. As market actors, businesses have a significant impact on promoting sustainable development and environmental friendliness. With the advent of environmentally friendly innovations, companies have been able to boost their overall efficiency. The human resource practices that mediate interventions are investigated in this study using resource-based theory. A total of 289 construction workers from Islamabad, Lahore, Peshawar, and Karachi participated in the cross-sectional study. A survey of construction industry employees in Pakistan is included in the dataset. A regression and moderated approach quantitative analysis technique was employed in the investigation. Green innovation boosts organizational performance, according to SPSS statistics. Green HR practices like training, performance evaluation, and employee engagement strengthen this interaction, according to the interaction analysis, which in turn supports the mediating effect on GI and OP. To maximize the advantages of green innovation, the results have shown how crucial it is to link HR processes with sustainability goals. This study adds to the growing body of literature on sustainable business practices and offers actionable advice to organizations that are serious about making a difference in the world via their people and business strategy.

**Keywords:** Organizational Performance, Green Innovation, HR Practices, Construction Industry

### **1. Introduction**

Organizational practices have evolved in response to growing public concern about global warming, environmental damage, and resource scarcity. Governments, stakeholders, and society at large are putting pressure on businesses across all sectors to reevaluate their long-term goals and adopt innovations with a focus on sustainability.



(Shan & Shao, 2024) define environmental innovation as the development of novel products, services, processes, or business models with the goal of enhancing sustainability while simultaneously decreasing negative impacts on the environment. In contrast to conventional innovation, green innovation boosts competitiveness while decreasing environmental impact. Green environmental responsibility is quickly rising to the forefront of business priorities, prompting researchers and practitioners to examine the effects of green innovation on company output (Moslehpour et al., 2023).

From this vantage point, the scope of organizational performance evaluations extends beyond monetary metrics. According to (Gazi et al., 2024), these factors encompass a company's long-term resilience, operational excellence, environmental efficiency, employee satisfaction, and brand reputation. Organizational performance is enhanced by green innovation, which promotes sustainable practices that lessen environmental impacts. By incorporating environmentally conscious technology and procedures, a company can boost its brand image and acquire a competitive edge. In addition, green innovation helps businesses be resilient in the long run by allowing them to adjust to shifting consumer tastes and government regulations. Taking a comprehensive view of organizational performance is critical for balancing corporate goals with social and environmental duties. Meeting legal standards and appealing to environmentally sensitive consumers and investors are both achieved when firms prioritize sustainability. Thus, businesses can have a positive impact on society and the environment while still ensuring their financial stability. Organizations can monitor their progress towards reducing carbon emissions, energy consumption, and waste creation through the use of key performance indicators. The best way to find places to improve and make sure you're following all the environmental rules is to conduct sustainability audits and assessments on a regular basis. According to Shan & Shao, (2024), stakeholders like employees and consumers can offer vital insights into how green efforts are perceived and how effective they are. The focus now shifts from environmental compliance as a last resort to sustainability as a driver of proactive innovation.

Green innovation, though, isn't simple. Alterations to organizational structure,



procedures, technology, and human resources are frequently necessary. For a company to be sustainable, its employees must actively participate, share what they know, and strive for constant development. Important here are HRPs. Green innovation can be aided or impeded by HR policies. Environmentally friendly human resource methods encompass eco-friendly hiring processes, environmentally friendly training, performance reviews based on sustainability, and reward systems that promote eco-conscious behavior (Abbas & Sağsan, 2019). These strategies encourage environmentally conscious innovation and boost productivity in the workplace.

Few empirical studies have examined the effects of green innovation on organizational performance and the moderating function of HRPs, even though this topic is becoming increasingly important (Srouji et al., 2023). Research on green innovation and human resource practices is often conducted in silos, ignoring their potential impact on performance. In turn, this makes it harder for businesses to foster environmental innovation through the utilization of human capital. A better integrated green strategy that takes human and technological aspects into account is also necessary due to the rapid evolution of environmental regulations and customer expectations (Aljehani et al., 2024).

In today's highly competitive global business landscape, sustainability is seen as a key differentiator that enhances corporate image and fosters trust among stakeholders. Responsible businesses that innovate in a green way attract talent, investors, and customers. Therefore, environmentally conscious innovation is crucial for both companies' bottom lines and the planet. Internal resources, particularly human capital, are crucial to the success of green innovation projects (Ahmed et al., 2023). Their attitude, talents, and devotion can determine the success or failure of green efforts. Consequently, HR strategies that align employee actions with sustainability objectives can enhance the effect of green innovation on business results.

Through the development of corporate culture, HR approaches influence employees' views and behaviors regarding the environment. Employees can be encouraged to embrace sustainability as a shared company goal through HR systems that offer onboarding, leadership development, and recognition (Nigatu et al., 2024a). According to Din et al. (2024a), when cultures are in sync, it promotes both individual



and group eco-friendly actions and new ideas. The mutually beneficial effects of HR policies and environmentally conscious innovation boost business output.

Green innovation in organizational strategy shows a lot of potential in emerging nations like Pakistan, where industrialization is a policy priority and environmental problems are serious. Nevertheless, there are instances where environmental initiatives are impeded due to a lack of knowledge, funding, and official support (Rennings, 2000). Human resource techniques can help encourage change from within. By building a sustainability culture, connecting HR processes with green goals, and investing in staff development, organizations can overcome external obstacles and achieve meaningful environmental benefits. Consequently, in developing nations, the moderating effect of HR policies on green innovation and organizational success is of utmost importance.

Additionally, digital transformation and Industry 4.0 are fueling the expansion of green innovation. Smarter, more environmentally friendly operations are made possible by AI, the Internet of Things, and big data analytics. The efficacy of these technologies is, once again, dependent on the preparedness and capabilities of the workforce. HR leadership that is innovation-oriented, digital upskilling, and cross-functional collaboration can help technology-driven green projects succeed (Sampene et al., 2024). Consequently, there is hope for improving organizational performance in the digital era through technological, environmental, and human resource initiatives.

Green innovation also requires the support of upper-level management and visionary leaders (Mamun, 2026a). To be successful, it will require the support of upper management, well-defined sustainability goals, and sufficient funding. Human resource systems that make strategy operational are essential for making these elements operational. Performance management systems that incorporate environmental metrics, incentive schemes that reward environmentally conscious actions, and sustainability-focused growth plans can all contribute to a greener innovation landscape (Shan & Shao, 2024). Therefore, HR policies mediate the relationship between green innovation and performance since they affect how an organization acts and its capabilities.

Also, current job norms, especially those of the younger generation, need to be considered. In contrast to previous generations, today's workers care more about having jobs that make a difference and that reflect their values, such as being environmentally



responsible, than they do about the monetary compensation they receive. Businesses can improve their recruitment, retention, and engagement efforts by integrating green innovation into operational processes and communicating these concepts through HR initiatives (Alshahrani & Iqbal, 2024a). By bringing workers' beliefs into line with the company's objectives, engagement can boost motivation, creativity, and output. Many internal and external factors influence the complicated relationship between environmentally friendly innovation and the performance of organizations. A strategic moderator, HR policies can either encourage or discourage green innovation. A company's ability to foster an innovative culture, educate and inspire employees, and align HR practices with environmental objectives may determine how successful its green innovation efforts are. This research takes a look at the correlation between green innovation and business success in developing countries and how HR policies and procedures affect it. It helps businesses achieve their green innovation objectives by bridging the gap between theory and reality by offering specific recommendations for how HR systems might be better integrated.

## **2. Literature Review**

### **2.1 Green Innovation**

Green innovation, also called eco-innovation and sustainable innovation, is defined as the process of developing and implementing new services, products, processes, or practices that help reduce environmental harm and boost sustainability as a business expands (Wang et al., 2022). Consumers of traditional innovation are motivated by profits, but green innovation places a greater emphasis on resource efficiency, waste reduction, energy conservation, and the prevention of pollution. Din et al. (2024b) define green innovation as a broad concept that includes the following components: the development of eco-friendly products, process innovation (which includes clean technology and energy-efficient processes), organizational innovation (which includes sustainable management systems), and marketing innovation (which includes green branding).

This concept has developed as a result of a growing awareness of environmental issues, an increasing demand on the part of consumers for environmentally friendly



products, and pressure from government entities. The implementation of green innovation has the potential to improve competitiveness, strengthen relationships with stakeholders, and enhance compliance with environmental regulations. Nigatu et al. (2024b) discovered that green innovation has a positive impact on corporate social responsibility, the reputation of a company, and market differentiation. On the other hand, it requires an extraordinary amount of dedication, collaboration between various functional teams, and strategic alignment with the culture and strengths of the business.

## **2.2 Organizational Performance**

Multidimensional organizational performance assesses how well an organization is doing at reaching its goals. The performance evaluation was carried out by making use of the following metrics: profit, return on investment, and market share. In addition to consumer happiness, modern performance evaluation takes into consideration a wide range of additional factors, such as innovative capacity, environmental impact, employee engagement, and operational efficiency. This complete perspective acknowledges the fact that to be successful in the long run, there needs to be ongoing value creation for all of the stakeholders involved, not only the financial gain (Levi-Bliech & Dahan, 2025). The level of organizational performance that a firm demonstrates in the field of green innovation is an indication of how effectively it is able to integrate environmental issues with its strategic goals. Operational expenses can be reduced by the use of sustainable practices, which can also enhance a company's reputation and increase the morale of its employees (Din et al., 2024c). According to Nigatu et al. (2024b), green innovation can have a positive impact on the performance of a business in both real and intangible ways. This includes things like increased efficiency and cost savings, as well as increased brand loyalty and stakeholder trust. The term "performance" ought to be understood as a balance between economic, environmental, and social outcomes, rather than as solely a financial consideration.

## **2.3 GHRM**

Human resource practices are the methods, procedures, and activities that are employed to manage and develop an organization's workforce to achieve strategic objectives. Methods such as recruitment, selection, training, performance assessment, compensation management, and employee interaction are standard practices. These



approaches improve the motivation, creativity, and productivity of employees when they are appropriately connected to organizational objectives (Achmad & Wiratmadja, 2025). GHRM, which integrates environmental objectives into human resources practices, is one of the most recent advancements in the field. The utilization of green recruitment, eco-friendly training, and sustainability-based performance metrics assists GHRM employees in developing a greater awareness of the environment (Mamun, 2026b). Employing individuals who support environmentalism, providing them with training in sustainable practices, and linking incentives to environmental results are all strategies that can be used to promote green innovation. HRP's play a role in facilitating employee involvement in and support of sustainable development projects. According to research, strategic human resource practices increase employee engagement for sustainability objectives and assist in the successful implementation of environmentally friendly policies (Alshahrani & Iqbal, 2024a).

## **2.4 Hypothesis Development**

### **2.4.1 Green Innovation & Organizational Performance**

Prior research has shown that green innovation not only contributes to the success of firms but also enhances the performance of those organizations (Rodriguez et al., 2022). In a similar vein, it has been shown by prior research that a corporation that is ambidextrous, which means that it excels at engaging in both exploitative and exploratory innovations, tends to attain higher levels of organizational performance (Aljehani et al., 2024). Research that was conducted in the past has demonstrated that businesses that are ambidextrous, which means that they excel at engaging in both exploitative and exploratory innovations, tend to have higher levels of organizational performance (Ahmed et al., 2023). The theory that is presented here serves as the basis for the presumption that GI has the potential to enhance OP. Organizations that are primarily focused on exploiting their people are often skilled enough to effectively cope with challenges by adjusting their operations and processes, as Truc et al. (2024) have stated. On the other hand, it is a very common practice for construction organizations to promote technological advancement by offering new goods and services that have the potential to contribute to higher operating performance. In addition to this, there is a significant inclination among construction firms to implement innovation. Wang et



al. (2022) state that to effectively implement operational procedures, a corporation should prioritize good governance and place a significant emphasis on sustainable practices. These practices should serve to both lessen the impact that the company has on the environment and stimulate innovation in the products, processes, or business models that the firm utilizes. The bulk of construction corporations successfully applied their knowledge to acts of exploitative and experimental environmental practices. Two elements that establish whether or not a company is capable of successfully improving its overall performance are the gastrointestinal capacity of its employees and the employees' enhanced performance. It is therefore suggested that:

**H1: GI improves organizational performance.**

#### **2.4.2 GI, GHRM & OP**

Because human resources (HR) activities give employees the skills, motivation, and environment they need to put into reality ideas that are environmentally sustainable, they are crucial in the process of encouraging green innovation (GI). Prior research has shown that green-oriented human resource management (HRM) techniques, such as environmentally responsible recruiting training, performance appraisals, and reward systems, have a favorable effect on green innovation (Khan et al., 2024). GHRM practices resulted in a considerable improvement in GI in construction, and the findings of Sheikh et al. (2024) revealed that construction businesses had a greater level of creativity when green HR policies were linked with employee motivation. A study conducted by Alshahrani & Iqbal (2024b) served to further establish this relationship. The authors of the study emphasized that employees view green HRM as a type of organizational support that encourages the adoption of innovative practices. Additionally, according to the findings of a study conducted by Nigatu et al. (2024b), the relationship between human resources and green innovation is mediated by green performance management, and stakeholder pressure serves as a contextual component that results in a higher estimate. GHRM serves as an important mediator of the route that leads from human resources to innovation. On the other hand, previous empirical research has been based on cross-sectional studies or self-reported data, which makes it difficult to establish causation. The majority of empirical research on green HR practices focuses on the operational level, with fewer studies being conducted on HR



practices, such as digitalization and talent analytics. The majority of research is industry- and region-specific, with the majority of the research being conducted within the Asian manufacturing and hospitality sectors. There has been little cross-analysis of other industries or institutional contexts (Achmad & Wiratmadja, 2025). The need for research that spans a variety of sectors to acquire a more profound understanding of the processes and limitations that allow for the production of environmentally friendly innovation through HR practices is highlighted by constraints such as these. Therefore, the second hypothesis is as follows:

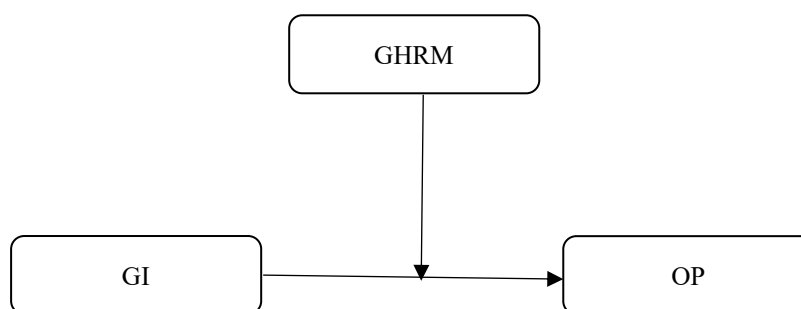
**H2: GHRM practices enhance green innovation.**

**2.4.3 GHRM, GI, and OP**

There has been a growing scholarly consensus in recent years on the significance of human resource (HR) practices in relation to the promotion of green innovation (GI) and the enhancement of organizational performance (OP). Because more and more businesses are adopting environmental strategies to reach their sustainability goals and to counteract outside influences, it has become more essential to organize human resource-based practices in a way that is consistent with the innovation-performance dialectic. Green innovation can be defined as the development of new behaviors, products, or processes that can reduce environmental damage and increase ecological efficiency (Nigatu et al., 2024b; Sheikh et al., 2024). Having said that, the presence of gastrointestinal issues alone does not necessarily mean that there will be an instant improvement in performance unless those issues are successfully supported and sustained through the use of strategic human resource management strategies. This serves as the basis for the third hypothesis regarding moderation (H3), which asserts that HR policies have a favorable impact on the relationship that exists between OP and green innovation. Furthermore, among the techniques that are employed in the management of human resources, green recruiting and selection, training and development, performance management, and reward systems are some of the practices that can be utilized to assist in the cultivation of a workforce that is not only concerned with the environment but is also motivated to implement novel methods. According to the findings of Sampene et al. (2024), GHRM has the potential to kick off the process of putting eco-innovations into practice by incorporating the value of green innovation

into the corporate culture as well as the mindsets of the personnel. However, the provision of opportunities for green training enables employees of organizations to have a better understanding of the company's environmental goals and to think creatively in a way that is in line with the company's green innovation practices (Mamun, 2026b). The collaboration of green incentive (GI) performance appraisal systems helps to enhance motivation to move forward and implement eco-responsible innovations, which in turn transforms GI into measurable outcomes, including savings on expenses, brand image, and compliance with regulations. The influence that human resources (HR) practices have on green innovation implementation is especially significant in situations in which the implementation of green innovation is multi-dimensional and necessitates substantial cooperation across functions. In cases like these, the capacity of an organization to absorb information is enhanced by the use of human resource practices, which increase the degree to which a company is able to recognize, absorb, and make use of new knowledge. This, in turn, increases the degree to which there is a connection between performance and green innovation (Rennings, 2000). Furthermore, individual organizations that are working in nations that are still developing or in countries with low resources are likewise incapable of implementing GI skills, knowledge, or dedication. In this instance, the practices of human resource management, which place a greater emphasis on empowering employees and cultivating green leadership, have the potential to function as facilitators. As a result, the innovation became more productive and effective. Therefore, the following was put forward as a hypothesis:

**H3: HR practices have a mediating effect on GI and OP.**



**Figure 1: Conceptual Framework**



### **3. Methodology**

The purpose of this quantitative, cross-sectional study was to investigate the impact of green innovation on organizational performance, with human resource practices serving as a moderating variable. A structured questionnaire was completed by 350 construction industry workers who were selected using the convenience sampling method in the cities of Lahore, Peshawar, and Islamabad, which are places where sustainability is becoming increasingly significant. Verified 5-point scale. The assessment of green innovation, organizational performance, and human resources practices was conducted using Likert scales. Moreover, assessing hypotheses and model associations, hypotheses and model associations were tested using SPSS-28 for descriptive statistics, reliability testing (Cronbach's alpha), correlation, regression, and moderation analysis. The findings' robustness and generalizability across the various sectors of Pakistan's expanding economy are guaranteed by this technique.

### **4. Results**

#### **4.1 Descriptive Analysis**

The fundamental variable characteristics were determined by employing data collected from a total of 350 participants. The standard deviation of the green innovation means, which was 0.68, was 3.76, showing that there was a very positive opinion of green innovation. The average score for organizational performance was 3.84 (SD = 0.71), which indicates that the majority of the participants thought that their organizations functioned effectively. With a standard deviation of 0.64, the average score was 3.91, indicating that the organizations that participated in the study were carrying out actions that were supported by GHRM to promote sustainability. In addition, the data were proven to be normal because the skew and kurtosis scores fell within the range of plus or minus one, which indicates that the assumptions of normal distribution were not as far-fetched as to infer a major divergence.



**Table 4.1: Descriptive Statistics**

Variable	N	Mean	S. D	Skewness	Kurtosis
GI	350	3.76	0.68	-0.42	-0.35
OP	350	3.84	0.71	-0.39	-0.28
GHRM	350	3.91	0.64	-0.46	-0.21

#### 4.2 Analysis of Reliability

Each construct was tested for reliability using Cronbach's alpha. With a Cronbach's alpha of 0.88, the green innovation scale demonstrated strong internal consistency. Because the items rated the organization's performance accurately, the dependability score of 0.91 was outstanding. Because Cronbach's alpha for human resource procedures was 0.89, it demonstrated the measurement's reliability. The instruments are reliable enough to perform further analysis when the values are more than 0.70 (Nunnally & Bernstein, 1994).

**Table 4.2: Reliability Analysis (Cronbach's Alpha)**

Scale	Items	Cronbach's Alpha
GI	6	0.88
OP	7	0.91
GHRM	5	0.89

#### 4.3 Matrix of Correlation

Pearson correlation coefficients have been calculated to examine the interactions between the variables. Green innovation and an organization's performance showed a strong and statistically significant positive correlation ( $r = 0.612$ ,  $p < 0.01$ ). Additionally, there was a positive correlation between HR practices and green innovation ( $r = 0.547$ ,  $p < 0.01$ ), indicating that as HR practices improve, so do green innovation initiatives. Additionally, there was a significant positive association ( $r = 0.591$ ,  $p < 0.01$ ) between HR practice and OP, suggesting that HR assistance is a



sign of better organizational performance. These strong positive correlations are preliminary evidence of the links the study hypothesized.

**Table 4.3: Correlation Matrix**

Variables	1	2	3
1. GI	1		
2. OP	0.612**	1	
3. GHRM	0.547**	0.591**	1

#### 4.4 Testing Hypotheses

Table 4.4 indicates that one has a positive and statistically significant influence on Organizational Performance (OP), which is GI and GHRM. In particular, the correlation between GI and OP is 0.085, and the t-value is 4.774; the significance level of P is less than 0.05, which means that there is a correlation between GI and OP, and as GI increases, the OP should also increase. On the same note, the b and t-values of the GHRM-OP relationship stand at 0.081 and 5.523, respectively, with P=0.05 indicating a positive relationship between the two practices. These two results indicate that there is overwhelming evidence against the null hypothesis, which proves the positive effect of both GI and GHRM on OP.

**Table 4.4: Hypothesis Testing**

Hypothesis	$\beta$	t	Sig.
<b>GI-OP</b>	0.085	4.774	P<0.05
<b>GHRM-OP</b>	0.081	5.523	P<0.05
<b>GI-GHRM-OP</b>	0.085	4.774	P<0.05

Table 4.4 also shows the findings of a mediating association among the GI, GHRM, and OP. The 8554 values of 0.085 show that there is a positive relation in the mediating path and hence the GI positively affects the GHRM, which, in turn, has a positive effect on the OP. Even finding a t-value of 4.774, there is statistical evidence that the mediating relationship is significant, and the significance level of P<0.05, in its



turn, proves that this mediation effect is statistically credible. It implies that GI modulates OP indirectly by influencing GHRM, and the connection is substantial to reject the null hypothesis.

## **5. Discussion**

This paper investigates the mediating effect of Green Human Resource Management on the relationship between Green Innovation (GI) and Organizational Performance (OP) and shows the statistically significant positive effect. The findings reveal that GI has a positive impact on GHRM, which leads to improvement in OP, adding to the existing literature on sustainability practices and organizational outcomes. The past literature has always shown that GI positively influences the performance of organizations by enhancing resource efficiency and competitiveness (Jabbour et al., 2013). In the same way, green practices, including green recruitment, training, as well as green performance management, set the employees on the path of sustainability and play a significant role in converting green practices into better performances (Renwick et al., 2013). The current study builds on this knowledge by validating the fact that GHRM mediates the relationship between GI and OP. This follows the social exchange theory, which assumes that the higher the performance of employees who feel that the organization is committed to sustainability (Cropanzano & Mitchell, 2005). The findings of the study are in agreement with the prior studies that demonstrated that organizations that have good green practices perform better than their competitors (Martínez-Conesa et al., 2017; Daily et al., 2012). The implications of these findings are practical; the organizations are advised to combine their GHRM strategies with their GI initiatives in order to maximize performance. The moderating influences that include organizational culture and leadership styles and industry-specific factors could also be examined in future research on the GI-GHRM-OP relationship.

### **5.1 Theoretical implications**

There are several theoretical ramifications to this study. First, it adds to the literature on green human resource management (GHRM) by presenting HR practices as a moderating element that favorably regulates the relationship between organizational performance and green innovation. This contrasts with earlier research, which typically viewed HR practices as direct precursors to performance or innovation.



Second, by highlighting how deliberately constructed heterogeneous resources, such as green HR systems, could enhance the value achieved by innovation capabilities, the results support and expand the resource-based view (RBV). Thirdly, by showing that green innovation is only successful when combined with HR practices that support environmental goals, the work strengthens the contingency hypothesis. Last but not least, the study's focus on small lodging enterprises in developing nations helps close the contextual gap and suggests that HR practices can significantly impact the relationship between innovation and performance, even in settings with limited resources. This information could be helpful for future cross-cultural or cross-industrial research.

## **5.2 Practical Implications**

For managers and policymakers, the paper also has some useful ramifications. First of all, it demonstrates the importance of integrating green innovation projects with HR practices in an effort to maximize organizational performance. Businesses need to ensure that their hiring, training, and evaluation procedures are environmentally conscious and supportive of sustainability. Second, managers are encouraged to invest in green HR competencies, such as creating sustainability incentive programs, offering specialized environmental training programs, and involving staff members in ecologically responsible decision-making. Thirdly, the creation of a green organizational culture in business enterprises is marked by the encouragement of leaders' commitment, employee involvement, and continuous improvement of environmental practices. Lastly, low-cost but high-influence HR interventions, like peer recognition, green champions, and informal eco-awareness initiatives, can continue to be very effective in boosting the success of green innovation projects in small and medium-sized businesses with limited technical or financial resources. These practical steps guarantee that HR is seen as a strategic actor that can help achieve sustainability and innovation outcomes rather than just a support function.

## **5.3 Limitation**

It is crucial to recognize the limits of this study, even if it offers insightful information on how HR policies moderate the relationship between green innovation and organizational performance. First, the study used a cross-sectional design, which



precludes drawing any conclusions about the causes of the variables. Using longitudinal data would allow for a more accurate determination of temporal relations around the change. Second, the study's focus on the construction sector may limit the findings' application to other industries or larger organizations, particularly in developed nations. Thirdly, self-reporting was utilized for data collection, which could have introduced common method variance, social desirability effects, or reporting bias. These prejudices could not be totally eradicated, despite efforts to lessen them. Lastly, the study ignored other organizational or contextual elements that might also affect the relationship between innovation and performance, such as leadership style, organizational culture, or external environmental pressures, in favor of concentrating only on the three primary HR practices of green ability, motivation, and opportunity.

#### **5.4 Future Directions**

The constraints stated above point to some potential avenues for further study. First, to address the specifics of how HR policies affect green innovation and performance over time, researchers should use experimental or longitudinal designs in the future. Second, the scope might be expanded to include new fields and geographical contexts, which would boost the results' generalizability and allow for the option of comparing different industries and geographical situations. Third, in order to develop a more comprehensive model of sustainability performance, it could be worthwhile to explore additional moderating/mediating elements in further research (such as organizational culture, leadership commitment, or regulatory environment). Fourth, an examination of the features of technical advancements, such as digital HR systems or green performance analytics, and how they contribute to greater GHRM efficacy in innovation would also be beneficial. Lastly, qualitative techniques such as case studies and interviews may be useful in gathering more detailed information regarding implementation challenges and the practical procedures of coordinating HR practices with green innovation activities.

#### **References**

Abbas, J., & Sağsan, M. (2019). Impact of knowledge management practices on green innovation and corporate sustainable development: A structural analysis. *Journal*



- of *Cleaner Production*, 229, 611–620.  
<https://doi.org/10.1016/j.jclepro.2019.05.024>
- Achmad, F., & Wiratmadja, I. I. (2025). Organizational performance and competitive advantage in SMEs: The role of green innovation and knowledge management. *Journal of Open Innovation: Technology, Market, and Complexity*, 11(2).  
<https://doi.org/10.1016/j.joitmc.2025.100532>
- Ahmed, R. R., Akbar, W., Aijaz, M., Channar, Z. A., Ahmed, F., & Parmar, V. (2023). The role of green innovation on environmental and organizational performance: Moderation of human resource practices and management commitment. *Heliyon*, 9(1). <https://doi.org/10.1016/j.heliyon.2022.e12679>
- Aljehani, S. B., Abdo, K. W., Nurul Alam, M., & Aloufi, E. M. (2024). Big Data Analytics and Organizational Performance: Mediating Roles of Green Innovation and Knowledge Management in Telecommunications. *Sustainability (Switzerland)*, 16(18). <https://doi.org/10.3390/su16187887>
- Alshahrani, S. T., & Iqbal, K. (2024a). How does green human resource management foster employees' environmental commitment: A sequential mediation analysis. *Heliyon*, 10(12). <https://doi.org/10.1016/j.heliyon.2024.e33202>
- Alshahrani, S. T., & Iqbal, K. (2024b). How does green human resource management foster employees' environmental commitment: A sequential mediation analysis. *Heliyon*, 10(12). <https://doi.org/10.1016/j.heliyon.2024.e33202>
- Din, A. U., Yang, Y., Yan, R., Wei, A., & Ali, M. (2024). Growing success with sustainability: The influence of green HRM, innovation, and competitive advantage on environmental performance in the manufacturing industry. *Heliyon*, 10(10). <https://doi.org/10.1016/j.heliyon.2024.e30855>
- Gazi, M. A. I., Rahman, M. K. H., Masud, A. Al, Amin, M. Bin, Chaity, N. S., Senathirajah, A. R. bin S., & Abdullah, M. (2024). AI Capability and Sustainable Performance: Unveiling the Mediating Effects of Organizational Creativity and Green Innovation with Knowledge Sharing Culture as a Moderator. *Sustainability (Switzerland)*, 16(17). <https://doi.org/10.3390/su16177466>
- Khan, A. N., Mehmood, K., & Kwan, H. K. (2024). Green knowledge management: A key driver of green technology innovation and sustainable performance in the



- construction organizations. *Journal of Innovation and Knowledge*, 9(1).  
<https://doi.org/10.1016/j.jik.2023.100455>
- Levi-Bliech, M., & Dahan, G. (2025). The impact of green innovation products on an organization's social performance via green supply chain management. *Green Technologies and Sustainability*. <https://doi.org/10.1016/j.grets.2025.100273>
- Mamun, M. (2026a). Green HRM and green innovation: Do environmental strategies and green culture matter? *Journal of Innovation and Knowledge*, 12.  
<https://doi.org/10.1016/j.jik.2025.100897>
- Mamun, M. (2026b). Green HRM and green innovation: Do environmental strategies and green culture matter? *Journal of Innovation and Knowledge*, 12.  
<https://doi.org/10.1016/j.jik.2025.100897>
- Moslehpour, M., Chau, K. Y., Du, L., Qiu, R., Lin, C. Y., & Batbayar, B. (2023). Predictors of green purchase intention toward eco-innovation and green products: Evidence from Taiwan. *Economic Research-Ekonomska Istrazivanja*, 36(2).  
<https://doi.org/10.1080/1331677X.2022.2121934>
- Nigatu, T., Degoma, A., & Tsegaye, A. (2024a). Green practices and economic performance: Mediating role of green innovation in Ethiopian leather, textile, and garment industries—An integrated PLS-SEM analysis. *Heliyon*, 10(15).  
<https://doi.org/10.1016/j.heliyon.2024.e35188>
- Nigatu, T., Degoma, A., & Tsegaye, A. (2024b). Green practices and economic performance: Mediating role of green innovation in Ethiopian leather, textile, and garment industries—An integrated PLS-SEM analysis. *Heliyon*, 10(15).  
<https://doi.org/10.1016/j.heliyon.2024.e35188>
- Rennings, K. (2000). Redefining innovation-eco-innovation research and the contribution from ecological economics. In *Ecological Economics* (Vol. 32).  
[www.elsevier.com/locate/ecocon](http://www.elsevier.com/locate/ecocon)
- Rodriguez, R., Roberts-Lombard, M., Høgevold, N. M., & Svensson, G. (2022). Organisational and environmental indicators of B2B sellers' sales performance in services firms. *European Business Review*, 34(4), 578–602.  
<https://doi.org/10.1108/EBR-05-2021-0123>



- Sampene, A. K., Li, C., & Esther Agyeiwaa, O. (2024). Green human resource to stimulate low carbon behaviour through the mediation role of innovation practices and organizational commitment. *International Journal of Innovation Studies*, 8(4), 364–380. <https://doi.org/10.1016/j.ijis.2024.09.001>
- Shan, H., & Shao, S. (2024). Impact of green innovation on carbon reduction in China. *Scientific Reports*, 14(1). <https://doi.org/10.1038/s41598-024-64554-y>
- Sheikh, A. A., Shan, A., Hassan, N. M., Khan, S. N., & AbdAlatti, A. (2024). Impact of green human resource management practices on hotels environmental performance: A mediation and moderation analysis. *Sustainable Futures*, 8. <https://doi.org/10.1016/j.sftr.2024.100409>
- Srouji, A. F., Hamdallah, M. E., Al-Hamadeen, R., Al-Okaily, M., & Elamer, A. A. (2023). The impact of green innovation on sustainability and financial performance: Evidence from the Jordanian financial sector. *Business Strategy and Development*, 6(4), 1037–1052. <https://doi.org/10.1002/bsd2.296>
- Truc, D. T. T., Giang, H. N. T., & Nga, N. Q. (2024). From customer pressures into environmental performance - the mediating role of green HRM practices. Evidence from a Vietnamese airline. *Transportation Research Procedia*, 80, 178–185. <https://doi.org/10.1016/j.trpro.2024.09.023>
- Wang, N., Zhang, J., Zhang, X., & Wang, W. (2022). How to Improve Green Innovation Performance: A Conditional Process Analysis. *Sustainability (Switzerland)*, 14(5). <https://doi.org/10.3390/su14052938>