

**CAPITAL UNIVERSITY OF SCIENCE AND
TECHNOLOGY, ISLAMABAD**



**Impact of Green HRM on Green Performance:
Mediating Role of Green Human Capital and
Moderating Role of Agile Leadership**

by

Asma Sabir

A thesis submitted in partial fulfillment for the
degree of Master of Science

in the

Faculty of Management & Social Sciences

Department of Management Sciences

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*Dedicated to my family who dedicated their lives to teach me how to step
forward...!*



CERTIFICATE OF APPROVAL

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Green Human Capital and Moderating Role of Agile Leadership**

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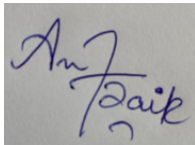
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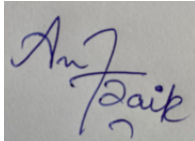
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Acknowledgement

“Then which of the Blessings of your Lord will you deny.”

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First and foremost, to my creator, my life coach, the most gracious, the most beneficent, ALLAH S.W.T, I owe it all to you, Thank you. There have been many people who have walked alongside me, who have guided me through all these efforts. I would like to outstretch gratitude to each of them. I would like to extend special gratitude to my supervisor, Dr. Shazia Faiz, whose contributions in simulating suggestions and encouragement, helped me to coordinate my thesis work and especially in attaining the results. It was because of your continued support and guidance that I was able to do it.

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(Asma Sabir)

Abstract

The current study aims to explain how does green HRM strategies effect green performance through the mechanism of green human capital. Furthermore, the study investigates whether agile leadership moderates the relationship between green HRM and green human capital. Data has been collected from 273 employees working in manufacturing companies in Pakistan and analyzed by using correlation and regression analysis through SPSS. The study investigation employed a positivist research methodology to examine the relationships. The study is cross-sectional. The study focuses on middle-level employees of manufacturing sector specifically, who play a vital role in the organizational hierarchy by serving as a link between entry-level occupations and upper-level management roles. The findings suggested that green HRM practices were positively associated with green performance. Furthermore, green human capital mediated the positive relationship between green HRM and green performance. Moreover, the findings revealed that agile leadership weakens the relationship between green HRM and green human capital. The study offers theoretical as well as practical implications. To help organizational leaders nurture creativity amid complexity and diversity, future research directions and managerial consequences are also presented.

Keywords: Green HRM; Green Performance; Green Human Capital; Agile Leadership

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Abbreviations

AL	Agile Leadership
DV	Dependent Variable
GHRM	Green Human Resource Management
GP	Green Performance
GHC	Green Human Capital
IV	Independent Variable

Chapter 1

Introduction

1.1 Background of the Study

The threat of worsening environmental problems becomes more real in modern-day Pakistan. Businesses have been urged to take accountability and achieve sustainable development since they are major contributors to environmental challenges (Diaz-Carrion, López-Fernández, & Romero-Fernandez, 2021; Tang, Ren, Wang, Li, & Zhang, 2023). According to (Amrutha & Geetha, 2020), GHRM is a psychological component that shapes people's perceptions of the environment. Human resources and environmental management" may have been the inspiration behind the concept of green HRM (Jackson & Seo, 2010). Pakistan, which has the fifth-highest population in the world, must create ecologically friendly and sustainable practices. A few studies have examined how HRM systems help organizations achieve environmental sustainability. From a related angle, one of the most important instruments for effectively establishing green innovation is green HRM, or the HRM traits of green management (Gim, Ooi, Teoh, Lim, & Yeap, 2022).

Wehrmeyer (2017) coined it as "Greening People" rethinking the core concepts of human resource management (HRM) and its objectives, roles, activities, processes, and strategies in an environmentally friendly manner in order to satisfy ecological sustainability standards is known as the "green orientation" of all HR functions or practices inside an organization, regardless of level. Green job design, employment and green selection, training and green development, green Performance

management, green pay management, health and green safety, and green work relationships also referred to as this multidimensional building are the seven fundamental pillars of green human resource management (Shah, 2019). Green HRM (Renwick, Jabbour, Muller-Camen, Redman, & Wilkinson, 2016) is the process of coordinating an organization's environmental purpose and goals with human management practices including hiring, training, evaluating, and rewarding employees and human aspects such as organizational culture, teamwork, and empowerment. Green recruitment is one of the five green HR practices that aid in recruiting more sustainable workers to the company (Zaid, Jaaron, & Bon, 2018). Researchers have targeted numerous industries, including information technology, hospitality and tourism, energy and utilities, healthcare, transportation and logistics etc, to explore green human resource management (GHRM). Depending on the research's particular focus, "green HRM" is also referred to by several other names like sustainable HRM, environmental HRM, eco-friendly HRM, and corporate environmental HRM are some synonyms or alternative names for green HRM (Renwick, Redman, & Maguire, 2013). Jackson and Seo (2010) shed light on several factors examined in the context of GHRM, including employee engagement, environmental performance, green training and development, leadership support, and sustainability reporting. GHRM guarantees environmental performance and upholds an organization's long-term sustainability objectives (Kim, Kim, Choi, & Phetvaroon, 2019; Renwick et al., 2016). The rapid advancement of science and the increased awareness of sustainability issues have prompted HR to implement green HR practices, with a focus on paperless solutions that minimize waste and carbon emissions (Ahmad, 2015).

Research on the function of GHRM is scarce., despite the practice's critical role in slowing environmental deterioration (Farrukh, Raza, Ansari, & Bhutta, 2022). Due to its high likelihood and severe consequences, environmental risk has become more concerning than other global threats during the past ten years (McLennan, 2022). The Clean Green Pakistan Movement (CGPM) project of the Pakistani government endeavors to tackle many concerns, including clean drinking water, complete sanitation, and the management of solid and liquid waste (Usman, Ullah, Ozturk, Chishti, & Zafar, 2020)(World Bank, 2019). In practically every

organizational function, the human resources department is in charge of creating sustainable development (Kot, 2023). According to studies, supply chain management (SCM) manufacturing organisations would find this to be of utmost importance (Hariharasudan, Kot, & Sangeetha, 2021; Muangmee, Kassakorn, Khalid, Bacik, & Kot, 2022). As a result, it was suggested that HR procedures follow green movements and methods to guarantee that all business operations related to manufacturing be done accordingly (Ren, Tang, & E Jackson, 2018). The International Energy Agency reported that global CO₂ emissions were 320.7 million tons (Zhang et al., 2021). (IEA, 2013). Between 2016 and 2018, Pakistan's CO₂ emissions increased by 3.31% (0.87 metric tons per capita compared to 0.98 metric tons per capita). Baloch, Shah, Noor, and Magsi (2018). Organization's sustainable development strategies are said to benefit greatly from green human resource management (GHRM), which is defined as the HRM-related environmental management aspects that highlight how an organization's operational procedures may be used to include HRM into pollution prevention. (Pham, Thanh, Tučková, & Thuy, 2020; Amrutha & Geetha, 2020).

A variety of widely used practices and tactics known under the title of "Green HRM" are intended to help businesses achieve their environmental objectives, nurture a sustainable culture, and incorporate ecological awareness into HR operations. GHRM practices encompass both the strategic HRM components in organizations and the traditional HRM practices that are in line with environmental aims (Gholami, Watson, Hasan, Molla, & Bjorn-Andersen, 2016). As to Yong, Yusliza, Ramayah, and Fawehinmi (2019), the importance of GHRM is demonstrated by its emergence as a crucial management strategy that aids businesses in decreasing their carbon footprints and enhancing their sustainability.

1.2 Research Gap

Using human resources management (HRM) methods for promoting ecological sustainability activities and strengthen employees' dedication to issues of environmental sustainability is known as "green HRM" (Bon, Zaid, & Jaaron, 2018). The effect of green hrn on green performance is an essential component of company

strategies that prioritize sustainability. A variety of strategies and techniques are included in green human resources management to incorporate awareness of the environment into HR procedures. Green company performance is improved by GHRM [C.-J. Chen and Huang \(2009\)](#). Organizations may achieve long-term sustainability and alignment with environmental goals by using GHRM practices, This might positively and long-term affect green performance.

Research in the field of environmental management has demonstrated a direct suggesting a positive relationship between GHRM and environmental performance ([Roscoe, Subramanian, Jabbour, & Chong, 2019](#)). A few researchers have looked at how GHRM influences environmental performance and when it does so. This can provide firms with a competitive edge ([Ali, Wang, Jiang, & Ali, 2019](#)). Industries employ HR practices as a critical tactic to create human capital to tackle environmental difficulties when confronted with external obstacles ([Yong et al., 2019](#)). By encouraging environmental awareness, offering eco-friendly training, and integrating employee values with sustainability, green human resource management has a positive impact on green human capital. This leads to a more skilled and environmentally aware workforce that supports sustainable business practices. Two essential HR practices that support the development of human capital in the industry are performance assessment and pay ([Amrutha & Geetha, 2020](#)). Green human resource management and green performance has been studied by ([Aftab, Abid, Cucari, & Savastano, 2023](#)), but it only covers specific GHRM practices, and other important dimensions such as recruitment and selection are missing.

Furthermore, the green performance is favorably impacted by green human capital, which consists of competent and environmentally aware workers. Sustainable practices, resource waste reduction, and eco-friendly innovation are all fostered by green human capital, and these factors eventually boost the firm's green performance. Organizations that engage in green human capital development through education, training, and the promotion of an environmentally conscious culture tend to see notable gains in their Green performance ([Abreu et al., 2022](#)). Smith & Brown (2019) also added that having green human capital may greatly improve an organization's green performance by promoting a sustainable culture, stimulating innovation, and guaranteeing adherence to environmental laws. [Youndt and](#)

Snell (2004) also given a clue that organizational performance can be influenced by human resource management strategies, but this effect can be explained by underlying mechanism of human capital. The idea that Green performance and Green HRM practices are mediated by green human capital is also supported by Song et al. (2021).

They explained that workers who possess a high degree of Green human capital is more likely to be driven and engaged in sustainable behaviours., which improves environmental performance results for the organizations. Green human capital acts as a medium via which information, values, and behaviors are transferred, hence mediating the link between Green performance and Green human resource management. Albloush, Alharafsheh, Hanandeh, Albawwat, and Abu Shareah (2022) also suggested that mediating role between GHRM and organizational green performance in the form of human capital can be valuable. The extant studies focuses solely on public or private organizations, restricting the findings' applicability to sectors and countries. Present study is an attempt to reveal a valid perspective of developing country and its workforce. Agile leadership is a method that combines these abilities, combining effective leadership and organizational flexibility, promoting teamwork, making timely and flexible choices, and adjusting to technology developments (Sobaih, Hasanein, & Elshaer, 2020).

Agile leadership plays a pivotal role in moderating the relationship between green human resource management and green human capital within organizations. Agile leadership ensures that GHRM is effectively implemented, leading to the development of green human capital, and, ultimately, improved green performance. Agile leaders are instrumental in ensuring that GHRM practices are not only implemented but also effectively adapted to the evolving sustainability landscape. According to Bushuyev, Onyshchenko, Bushuyeva, and Bondar (2021), an agile leader is someone who takes down obstacles so that teams may accomplish their objectives and provide value to the project.

Agile leadership, according to Abbasi and Ruf (2020), requires a new way of thinking about seeing leadership. Though research on green human resource management and its effects on the growth of green human capital have been conducted, there is a noticeable lack of information in the literature about how agile leadership

influences this relationship (Haldorai, Kim, & Garcia, 2022). In the hectic world of business today environment, organizations must adopt and implement environmentally friendly practices. Green HRM, or green human resource management, is one accepted tactic.

However, we still don't fully understand the precise mechanisms via which green HRM affects green performance. The goal of this research is to investigate this gap the ways and degrees in which green HRM practices impact green performance, with a focus on the mediating role of green human capital. Furthermore, by studying the moderating effects of agile leadership on the relationship between green HRM, green human capital, and green performance, it recognizes the critical role that leadership plays in navigating the challenges of sustainability in organizational contexts.

The study was carried out in Pakistan, which is the second most polluted nation in the world as a result of environmental regulations (Ahmad, Ahmed, Yang, Hussain, & Sinha, 2022). Green manufacturing techniques have been used in Pakistan to prevent more harm to the environment. For this research manufacturing sector has been identified as the central focus of our research due to the sector's extensively documented environmental footprint. Manufacturing activities are characterized by notable resource consumption, waste generation, and emissions, collectively contributing to pressing environmental issues. This sector emerges as a noteworthy contributor to environmental challenges, rendering it a pivotal field for examination.

1.3 Problem Statement

In the dynamic and rapidly evolving business landscape, organizations are increasingly recognizing the significance of incorporating sustainability into their HRM procedures. Green Human Resource Management has emerged as a strategic approach to align HR practices with environmental sustainability goals.

This paradigm shift raises critical questions about the impact of Green HRM on overall organizational performance, particularly within the framework of green performance. Organizations adopting Green HRM practices may face challenges

in optimizing their impact due to the complex and dynamic nature of the contemporary business environment.

There is absence of a clear understanding of the mechanisms through which Green HRM translates into enhanced green performance, how Agile leadership practices may facilitate or impede this relationship is also limited.

Consequently, organizations are grappling with the practical implementation of Green HRM initiatives, unsure of how to leverage human capital effectively and adapt leadership approaches to maximize their ecological and organizational impact, thus this study attempts to explore the intricate connections between Green HRM, Green Human Capital, and Agile Leadership in manufacturing sector in Pakistan.

1.4 Research Question

This study aims to address this research gap by investigating the following questions:

1. Does green HRM positively affect green performance?
2. Green human capital mediates the relationship between green HRM and an organization's green performance or not?
3. How agile leadership moderates the relationship between green HRM and green human capital?

1.5 Research Objectives

The set objectives of this study are stated below:

1. To investigate the relationship between green HRM and green performance.
2. To examine the mediating role of green human capital between green HRM practices and green performance.
3. To explore the moderating role of agile leadership between green HRM practices and green human capital.

1.6 Significance of Study

This study aims to help HR managers comprehend the importance of green HRM. There are few studies that look into the direct link between green HRM practices and green performance. In order to close this gap, the current study will examine the connection between green performance and green HRM. Green HRM techniques can streamline production procedures to cut down on waste, preserve resources, and lessen their negative effects on the environment. Manufacturing companies may enhance their operational efficiency and attain superior green performance by cultivating green human capital via training and development programs. Manufacturing businesses must comply with strict environmental rules. By implementing Green HRM practices, employers may lower regulatory risks and potential fines or penalties by ensuring that workers are aware of and comply with environmental regulations. Manufacturing companies are better positioned for long-term sustainability and resilience when they invest in green human resource development, agile leadership, and green HRM. These companies are able to adjust to changing market demands and environmental difficulties by incorporating environmental considerations into their organizational culture and commercial plans. This study is critical because it highlights the intricate relationships between HRM practices, employee skills, and leadership strategies to accomplish green organizational objectives, which are necessary for organizations to traverse in order to meet the pressing need to navigate environmental sustainability. Through the identification of these links, the research advances the application of green HRM, which benefits organizations by helping them make better use of their human capital, align leadership with sustainability objectives, enhance overall performance, and establish a more moral and sustainable corporate environment all of which support international efforts to safeguard the environment and advance sustainable development. Findings of this study could offer practical insights for organizations seeking to enhance their sustainability performance. It suggests that integrating Green HRM practices, fostering green human capital, and adopting agile leadership approaches can collectively contribute to improved environmental sustainability within organizations. This study adds to the academic literature by providing empirical evidence of the relationships between green HRM, green human capital,

agile leadership, and organizational green performance. It contributes to a greater comprehension of the processes via which HRM practices influence sustainability outcomes and provides a foundation for further research in this area.

1.7 Supporting Theory

Abilities, Motivation, and Opportunities (AMO) is the underpinning theory for this study. [Bailey and Rachal \(1993\)](#) model served as the foundation for [Appelbaum \(2000\)](#) development of the AMO framework. The significance of employees' skills or competencies is emphasized by the "A" component of the AMO theory. It is reasonable to anticipate that green HRM practices will improve workers' green competencies in the setting of the study. By providing workers with the information and abilities needed for sustainable practices, green HRM efforts including education, training, and development may successfully increase their green human capital. This part of the AMO theory lends credence to the notion that green HRM helps employees build their green competencies, which may then impact green performance.

The AMO theory's "M" component is all about engagement and motivation. Agile leadership has the potential to be a very effective motivator because of its emphasis on flexibility, teamwork, and creativity. Employee participation in sustainability efforts may be encouraged and inspired by agile leaders. They can establish a culture in which the organization's mission and vision are in harmony with environmental aims, inspiring staff members to take an active role in eco-friendly practices. In this way, agile leadership helps the AMO framework's motivational component.

The chances that employees have to put their skills and motivation to good use are covered by the "O" component of the AMO. Green HRM practices give staff members chances to participate in eco-friendly initiatives inside the company. These procedures give staff members a way to put their enthusiasm and green skills into practice. Furthermore, agile leadership has the power to develop a dynamic workplace that offers chances for change and innovation, particularly those connected to sustainability. Employees who are motivated by the organization's commitment

to sustainability are more likely to acquire the necessary knowledge, skills, and attitudes (Green Human Capital) to support environmental initiatives effectively. The AMO framework suggests that the impact of GHRM on Green Performance is mediated by Green Human Capital, as employees' abilities and motivation drive their contributions to environmental sustainability. Moreover, Agile leadership moderates this relationship by creating opportunities for employees to leverage their skills and motivation effectively. The AMO framework provides a holistic understanding of how GHRM practices, mediated by Green Human Capital and moderated by Agile leadership, influence Green Performance. By focusing on enhancing employees' abilities, motivation, and opportunities, organizations can maximize the effectiveness of their GHRM initiatives and achieve sustainable success in environmental performance.

Chapter 2

Literature Review

2.1 Green Human Resource Management

The integration of eco-friendly principles and methodologies into human resource strategies, policies, and procedures to bolster organizational sustainability and mitigate the ecological footprint of human resource operations ([Renwick et al., 2013](#)).

2.1.1 Key Aspects of Green HRM

- Recruitment and selection are integral HRM practices for identifying, attracting, and choosing the most qualified candidates to fill specific roles within an organization. Recruitment focuses on sourcing potential candidates, while selection entails evaluating their suitability through interviews, assessments, and appraisals ([Dessler, 2011](#)).
- Training and development initiatives are designed to augment employees' knowledge, competencies, and skills. This facet encompasses onboarding, on-the-job training, workshops, and various learning opportunities aimed at enhancing job performance and fostering career progression ([Noe, Tews, & Michel, 2017](#)).
- Compensation and benefits: Employers must have a positive impact on employee performance and comprehend the various aspects of compensation as motivators that drive employees' behavior towards accomplishing organizational goals in order

for an organization to effectively oversee compensation (Larbi, 2014). Giving generous rewards keeps workers on board and eventually fosters loyalty, dedication, and job satisfaction.

According to Salisu, Chinyio, and Suresh (2015), compensation is the benefit that employees receive in exchange for their labor or contribution to the company. In the meantime, the other author said that compensation is a methodical way to give workers money and other advantages in return for their labor and service (Berber, Morley, Slavić, & Poór, 2017).

- Performance management involves establishing clear expectations, delivering feedback, and assessing employees' job performance.

It encompasses goal setting, periodic evaluations, and performance appraisals, all geared toward enhancing individual and organizational efficiency (Aguinis & Burgi-Tian, 2023).

- Green involvement actively promotes engagement in sustainability initiatives and the decision-making processes about environmental practices. When employees are actively involved in shaping eco-friendly policies and projects, they take greater ownership of green performance, yielding more positive results (Ren et al., 2018).

2.2 Green Human Capital

Green human capital can be defined as the aggregate of employees' expertise, competencies, practical experience, insights, innovative thinking, and dedication related to environmental conservation and sustainable innovation. This collective knowledge is intrinsic to individual employees and is not organization specific (C.-J. Chen & Huang, 2009).

2.3 Green Performance

The green performance of businesses underscores the optimal utilization and efficient allocation of corporate resources to mitigate or even eradicate the risks and environmental harm associated with business operations, all in pursuit of achieving

sustained and efficient longterm corporate functioning ([Amores-Salvadó, Martín-de Castro, & Navas-López, 2014](#)).

2.4 Agile Leadership

Agile leadership is characterized by a leadership style that places a premium on adaptability and views change as a potential opportunity. It promotes a culture centered on collaboration, experimentation, and a commitment to ongoing enhancement, empowering organizations to effectively address the ever-evolving challenges and opportunities in today's rapidly changing and uncertain business environment" ([Hoda & Murugesan, 2016](#)).

2.5 Green HRM and Green Performance

Green Human Resource Management (GHRM), which integrates sustainable practices with environmental stewardship, has emerged as a critical technique for effective management, with the goal of promoting organizational performance. [Al Kerdawy \(2019\)](#) emphasizes the significance of GHRM and how it promotes organizational sustainability by balancing sustainable performance with environmental management. Strategic human resource management techniques, or GHRM for short, are used to develop and implement environmental business strategies that support environmental sustainability inside the company ([Chaudhary, 2019](#)). HR methods, such as green performance management, green recruiting and selection, green training, performance management, and green engagement, can have varying benefits based on how well they align with sustainability aims and strategies ([Tang, Chen, Jiang, Paillé, & Jia, 2018](#)). These procedures are essential for converting environmental goals into activities that the entire company can implement. Efficient recruiting and selection processes may guarantee that those hired not only fit the job description but also the company's environmental goals and values. As a result, workers may become more dedicated to sustainability. Green recruiting, one of the five strategies we looked at, is the process of bringing in fresh talent to the company who understands sustainable growth and has environmental

competences. Selecting job candidates that exhibit pro-environmental behavior is the main goal of green recruiting (Guerci, Longoni, & Luzzini, 2016). In order to achieve the organizational objective of environmental sustainability, it seeks to align employers' and workers' ideals towards environmental preservation.

While (Longoni, Luzzini, & Guerci, 2018) showed that green performance and green compensation are favorably associated to environmental performance; Yong et al. (2019) showed that there is no significant association between green performance and green compensation and environmental performance. Employee competency and environmental awareness may be improved via training and development initiatives. They may enhance a company's green performance by educating employees about sustainability principles and giving them the freedom to adopt and carry out green initiatives (Dixon, Thiruchselvam, Todd, & Christoff, 2017).

An organization may track and assess its green performance by integrating environmental KPIs and objectives into its performance management system. Eco-friendly incentives, such as bonuses for achieving sustainability targets or providing advantages that encourage a green lifestyle, can be included in compensation and benefits packages. Participation in green involvement can result in the adoption of green policies and practices more successfully. Engaged workers are more likely to adopt and encourage environmentally friendly practices, which improves environmental performance (Robertson & Carleton, 2018). Therefore, earlier studies (Ali et al., 2019; Elshaer, Sobaih, Aliedan, & Azazz, 2021; Sobaih et al., 2020) highlight how crucial Green Human Resource Management (GHRM) is to advancing an organization's green performance. Through the integration of HR practices with environmental goals, GHRM acts as a driving force for improving sustainability results in organizations. A corporation may align its HR practices with its entire business plan by using these measures (Islam, Khan, Ahmed, & Mahmood, 2021).

Organizations may guarantee the integration of sustainability objectives into all facets of their strategy by integrating environmental issues into their HR processes. The smooth integration of environmental sustainability into organizational operations and culture is made possible by this alignment. By putting GHRM principles into effect, an organization may quickly increase its Green Performance. Examples

of these practices include adding environmental regulations to employee job descriptions and recruiting employees who actively work to better the environment. Likewise, [Yusoff, Nejati, Kee, and Amran \(2020\)](#) state that GHRM allows organizations to take environmental policies into account. Organizations may guarantee that sustainability concepts are ingrained in all facets of human resource management by incorporating environmental issues into HR policies and practices. Moreover, they claimed that enhanced Green Performance is a result of GHRM procedures, such as green hiring and selection, training, and pay.

The employees who are directly and indirectly influenced by these changes in their personal and professional lives are crucial to the successful implementation of GHRM practices ([Ren et al., 2018](#)). Businesses may also use advertising to showcase their green image, environmental performance, and environmental policy, which may entice candidates to apply for available positions. Consequently, the job description for a particular post should emphasize the environmental obligations related to that role as well as the skills and information candidates would need to carry out environmental responsibilities ([Chaudhary, 2018](#)). An organization's lifespan is significantly influenced by individual performance. Performance is determined by an individual's behavior or actions. It may be assessed from the standpoint of contextual performance, which consists of activities that improve an organization's effectiveness by fostering an environment that facilitates task completion ([He, Morrison, & Zhang, 2021](#)).

According to [Dubey and Gupta \(2018\)](#), the importance of Green Human Resource Management (GHRM) in promoting sustainability goes beyond social and economic performance to encompass environmental responsibility and understanding. GHRM programs are intended to incorporate sustainability ideas into HR procedures, encouraging environmental stewardship in business cultures. Along with increasing staff awareness of environmental challenges, these initiatives encourage sustainable activities and behaviors across the board.

The benefits of HRM in assisting organizations in achieving green sustainability goals are highlighted by recent studies. Organizations may use their human resources to promote environmental efforts and enhance overall sustainability performance by coordinating HR practices with sustainability objectives. Green training

and development programs, among other GHRM activities, are essential for raising employees' environmental consciousness and promoting sustainable results (Nejati, Rabiei, & Jabbour, 2017). According to Malik et al. (2020), green training and development programs increase workers' worth by enhancing their knowledge of sustainable practices and environmental challenges. Staff members who complete these courses will have the knowledge, skills, and tools necessary to incorporate environmental issues into their daily workdays.

According to Zaid et al. (2018), an organization's EP is favorably correlated with green hiring and training practices. Employers may help staff members achieve their environmental goals by focusing on environmental concerns and teaching them how to preserve the environment through green training (Kim et al., 2019). The green pay and incentive system is intended to draw in, keep, and inspire workers to support environmental goals within the framework of reward management (Saeed et al., 2019). Individual green HRM strategies are unlikely to be as successful as integrated sets of GHRM activities that provide motivation, ability, and opportunities to improve organizational environmental performance (Chuang, Jackson, & Jiang, 2016). According to Ojo, Tan, and Alias (2022), it is imperative that staff receive enough training to provide them with the skills and information needed to adopt green HRM practices in an efficient manner. By providing such training, employers may make sure that their staff members are prepared to make decisions that support the organization's environmental sustainability.

They will be inspired to adopt green practices within the company as a consequence. While Hameed, Khan, Islam, Sheikh, and Naeem (2020) used resource-based review theory to confirm that green human resources have a significant impact on a firm's green performance, Mogeia (2023) claims that training and development activities are important because they demonstrate how human resources support strategic goals and objectives. GHRM procedures improve client happiness and quality hiring, both of which support OP. According to Roscoe et al. (2019), companies that encourage employees to be environmentally sensitive see a decrease in actions that result in pollution and needless waste. Organizations may contribute to environmental preservation and improve operational efficiency by fostering a culture of responsible consumption and waste reduction among their

employees by providing them with education on sustainable measures. This strategy reinforces the business's dedication to sustainable practices and is in line with more general environmental objectives. Green HRM techniques increase employee participation in sustainability initiatives by encouraging a feeling of group responsibility for environmental preservation (Pinzone, Guerci, Lettieri, & Redman, 2016). The term "green HRM," or "human resource management," describes how environmentally friendly procedures are incorporated into HR procedures to support organizational sustainability. According to Jerónimo, Henriques, de Lacerda, da Silva, and Vieira (2020), green hiring and training techniques are crucial since they prioritize applicants who have eco-conscious beliefs and offer instruction on sustainable practices.

In line with this, Ahuja (2015) emphasizes how green HRM may support staff members in embracing sustainable practices and fortifying their environmental duty. Studies by Jamal et al. (2021) and Tanveer, Yusliza, and Fawehinmi (2024) demonstrate the established link between Green HRM and business sustainability. Research suggests that putting green HRM methods into practice has benefits including less of an impact on the environment, more efficient use of resources, and more employee involvement in sustainability projects. All things considered, Green HRM is essential to advancing organizational sustainability since it harmonizes human resource procedures with environmental goals and cultivates an eco-aware culture among staff members (Tanveer et al., 2024).

According to Ren et al. (2018), there is a growing trend among firms to embrace green human resource management (GHRM) as a crucial approach to integrating environmentally friendly practices. This approach can improve environmental performance and promote sustainable growth. Organizations may successfully connect their staff with environmental objectives and encourage eco-friendly behaviors and activities at all levels by incorporating green concepts into HR policies and procedures.

This strategic focus on GHRM ensures that firms actively participate in reducing their environmental effect while promoting organizational performance. It also helps to achieve long-term sustainability goals. Agyabeng-Mensah et al. (2020) found that the incorporation of environmentally friendly HR practices improves

overall environmental results within organizations. This suggests that Green Human Resource Management (GHRM) favorably promotes organizational green performance. This research emphasizes how crucial it is to match HR tactics with sustainability objectives in order to improve environmental performance. Employee efficiency has grown as a result of GHRM activities including training, assistance, personal development, and enhanced reward and compensation programs (Gyamfi, Adebayo, Bekun, & Agboola, 2023). GHRM is essential for bringing forth the dormant green activities and thoughts of employees.

Through the provision of assistance and opportunities for personal growth, GHRM enables staff members to provide creative ideas and environmentally friendly practices in their work, which enhances job performance (Hernández Pardo, Bhamra, & Bhamra, 2012). Furthermore, it has been demonstrated that integrating green innovation techniques, which GHRM facilitates, significantly improves EP. Companies using these tactics not only improve their environmental credentials but also get financial and competitive advantages in the marketplace (Michalik, Besenfelder, & Henke, 2019). Increasing employee awareness of environmental issues is another very powerful strategy to increase EP (Ikram, Zhou, Shah, & Liu, 2019). Businesses with a well-developed environmental management system (EMS) that integrates successful GHRM policies, practices, and initiatives have superior environmental presentation, according to (Huang, Wang, Chin, Huang, & Cheng, 2022).

The objective of green human resource management is to improve an organization's total green performance by incorporating environmental sustainability into HR procedures. According to research, companies who use Green HRM practices may see several advantages, such as less of an adverse effect on the environment, more eco-efficiency, and greater corporate sustainability. Zaid et al. (2018) offer a conceptual paradigm (i.e. green performance, financial performance, operational performance, and social performance) to illustrate the relationship between Green HRM bundle practices and organizational performance. According to Karatepe, Rezapouraghdam, and Hassannia (2020), green employee participation is a motivator or indicator that affects the results of green organizational performance. Green skills and motivation have an impact on the link between environmental

performance and green training, according to (Yafi, Tehseen, & Haider, 2021); all six competency dimensions that were looked at skills, abilities, knowledge, behavior, attitude, and awareness increased green motivation and employees' capacity to come up with new ideas when they were involved in the organization's initiatives. Green Organizational Performance is strongly impacted by green training and development initiatives. AMO theory was applied in studies by Obereder, Müller-Camen, and Renwick (2022) to look at how GHRM affects the functioning of organizations. According to the Abilities, Motivation, and Opportunity hypothesis, employees require the following factors in order to perform at their best: the opportunity, the drive, and the appropriate skills. Hiring people who possess the abilities and expertise required for environmentally sustainable operations might be the main goal of GHRM recruiting strategies. Educating staff members on environmentally friendly procedures improves their capacity to comprehend and use sustainable practices in their jobs. Green benefits or incentives might encourage staff members to embrace eco-friendly practices. Bonuses for reaching sustainability goals or other incentives linked to eco-friendly performance might fall under this category. Giving workers the chance to contribute to green projects or provide eco-friendly suggestions encourages a sense of ownership and participation. Providing chances for skill development within the framework of sustainability creates pathways for staff members to participate in environmentally friendly actions. Several research projects suggested that Green HRM improves green performance (Ahmad et al., 2022).

Thus, the following hypothesis is proposed.

H1: Green HRM has a positive impact on green performance.

2.6 Green HRM and Green Human Capital

According to RBV, human capital is a crucial resource for the accomplishment of a plan. To enable the successful implementation of a plan, human capital preparation is essential (Talapatra, Santos, & Gaine, 2022). Organizations are urged to employ their own internal assets, notably green human capital, as a result of stricter environmental rules and growing public awareness of environmental

concerns (Tjahjadi, Agastya, Soewarno, & Adyantari, 2023). Several factors can encourage the increase in the number of green human capital in the company, one of which is human resource management. HR management practices are environmentally oriented through Green HR Management (Ma, Chen, & Ruangkanjanases, 2021). An organization's green human capital may benefit from green HRM practices such as training, performance management, green engagement, green compensation, and green hiring and selection. According to Haldorai et al. (2022), GHRM might be advantageous for green human capital.

Green HRM methods, such as hiring and selecting candidates that priorities sustainability, offering training on environmental concerns, and including sustainability goals into performance management, can have a beneficial influence on employees' green knowledge, skills, and behaviors. Since human capital is specific to each organization, it is difficult for other industries to replicate and provides the necessary resources and capabilities for competition (Zahra, Neubaum, & Hayton, 2020). Green Human Resource Management (GHRM) serves as a mechanism to improve human capital by aligning HR procedures with sustainability goals and fostering an environmentally conscious culture within organizations. Green hiring techniques help to create a sustainable culture inside the company by drawing in candidates that have a strong commitment to sustainability.

Green HRM enhances an organization's human capital by fostering an environmentally conscious culture and connecting HR practices with sustainability objectives. Selection of candidates who demonstrate a commitment to sustainability or who are knowledgeable about environmentally friendly methods is part of the GHRM hiring process. Employing individuals that have a strong commitment to sustainability and the environment is ensured by using green recruiting procedures. As a result, the firm cultivates a sustainable culture and its personnel become more in line with its environmentally conscious objectives and principles (Hassan & Pasha, 2023). According to Yong et al. (2020), GHRM practices are crucial for coordinating corporate strategy with environmental factors. The study conducted in Malaysian manufacturing enterprises revealed that green recruiting and training had a good influence on sustainability. However, no significant benefits were identified for other GHRM activities, such as selection and performance

evaluation.

By taking into account other moderating or mediating variables that they believed may be involved in these interactions, they proposed improving and modifying their framework. In order to evaluate the framework's broader applicability, they also urged other scholars to use it in different circumstances. HRM is believed to have a significant impact on organizational performance and the creation of sustainable organizations. [Al-Tit \(2016\)](#) revealed employers who use GHRM are able to draw in talent by offering sustainable and purpose-driven work environments, which improves company branding and lowers employee turnover ([Munawar, Yousaf, Ahmed, & Rehman, 2022](#)).

Positive employee attitudes and behaviors are linked to green HRM policies and practices, which lessen businesses' environmental effect and increase their capacity to maintain themselves. The creation of Green Human Capital is greatly impacted by Green HRM practices, which produce a staff that is motivated and knowledgeable about the environment to support organizational sustainability objectives. Employees are better equipped to make educated judgments and support green efforts by being knowledgeable about environmental challenges, green technology, and sustainable practices ([Alkhodary, 2022](#)). GHRM places a strong emphasis on training programs that improve staff members' comprehension of environmental concerns, sustainable practices, and the company's dedication to eco-friendly projects. Human capital is embedded in people when they change positions, and it is also removed from organizations ([Allameh, 2018](#)).

Employees can cultivate environmentally conscious traits through training activities ([Yong et al., 2019](#)). Training helps to raise worker productivity, contentment at work, and general organizational efficacy By providing workers with the information and abilities they require to comprehend and apply sustainable practices. As a result, human capital is essential crucial intangible asset in fostering sustainability within organizations. According to [Yusliza et al. \(2019\)](#), human capital enables businesses to identify their intangible assets and undertake environmentally friendly initiatives outlined how a stronger emphasis on GHC would lead to larger green organizations since employees with better environmental knowledge and awareness would be more competitive.

According to [Yong et al. \(2019\)](#), one of the important concepts in organizational science is "green human capital," which is also known as an essential determinant in the adoption of green HRM practices. Workers with green training are more equipped to back green projects. It improves people's comprehension of environmental concerns and gives them the ability to make wiser decisions that encourage eco-friendly actions ([Dixon et al., 2017](#)). Green performance management system which is applied as a system in the company has a positive effect on employee performance which results in green performance of the firm.

The research of [Sabrina, Nabilah, Ricardianto, and Fitriana \(2021\)](#) which states that the green performance management system has an effect on green performance. Environmental KPIs and targets are created and monitored as part of green performance management. By encouraging workers to match their efforts with sustainability goals, this approach promotes responsibility and enhances environmentally friendly performance. Incentives for reaching sustainability targets may be included in green compensation practices. As these rewards encourage staff members to actively engage in environmental activities and improve social and environmental outcomes.

Employee participation in green projects is encouraged to be proactive in sustainability efforts. A feeling of environmental care and duty is demonstrated by Green Employee Involvement, Green Training, and environmentally conscious personnel ([Pham et al., 2020](#)). Employee engagement in maintaining the company's environmental cleanliness, bolstered by green competency, may enhance the organization's environmental performance. [Renwick et al. \(2013\)](#) claim that when employees are involved in green initiatives, the workforce becomes more environmentally conscious and actively supports and develops the company's green human capital. In order to promote a feeling of environmental responsibility, GHRM supports staff involvement in green activities. GHRM makes it possible to evaluate employees' contributions to sustainability objectives by integrating environmental performance criteria into performance appraisal systems. The strategic advantage of human capital is essential for maintaining corporate efficiency, as employees' skills and knowledge are vital for a business to thrive in the modern, cutthroat marketplace. However, there isn't much research in the literature to support the

presence of green human capital (Yong et al., 2019). There is also the opinion that educational systems contribute to the development of green talent and increase workers' proficiency in the industrial processes. As a result, showcasing green human capital may help an organization execute green initiatives in a challenging business environment and can also represent its intangible assets, such as knowledge, skills, and capabilities. A company can only reach its objectives with the dedication of top management, and they play a critical role in implementing green concepts (Yusliza et al., 2019).

The literature documenting the presence of green human capital is minimal (Yong et al., 2019). Another belief is that The Abilities, Motivation, and Opportunity (AMO) Theory is a key concept in the development of Green HRM practices in a variety of organizational contexts. Organizations may strengthen their environmental commitment in recruiting and selection by including green factors into hiring procedures, which will guarantee the acquisition of talent in line with sustainability objectives. Green engagement programs encourage staff members to actively participate in environmentally friendly projects and strengthen the incentive for sustainable practices by associating pay and bonuses with green accomplishments. Employees are further empowered to contribute to green objectives through opportunities for skill development in environmental awareness, a crucial component of training and development. A framework for monitoring, controlling, and enhancing the environmental impact of the workforce is provided by clearly defined green performance metrics in performance management. This, in turn, helps to create a Green Human Capital that is both competent and driven to advance sustainability within the company. Green HRM positively impacts Green Human Capital by aligning HR practices with sustainability goals.

Hence, it can be hypothesized that:

H2: Green HRM has a positive impact on green human capital.

2.7 Green Human Capital and Green Performance

When used in conjunction with plans aimed at achieving exceptional performance, human capital resources will work successfully (Bag & Gupta, 2020). While

Khanlarov, Lyeonov, and Starchenko (2020) showed that in order for SMEs to voluntarily incorporate environmentally friendly practices into their company operations in order to achieve green performance, green human capital is a crucial component. According to Barney (2001), the Resource-based View emphasized the value of human capital in enhancing an organization's performance and giving it a competitive edge over rivals. The knowledge, abilities, and dedication to environmental responsibility and sustainability that makeup green human capital are what propel an organization's green performance. Green human capital employees are more likely to be devoted to sustainability goals and knowledgeable of environmental challenges. Initiatives to lessen environmental effects, encourage resource efficiency, and improve overall environmental performance might be sparked by their expertise and dedication (Dutta, Lanvin, Wunsch-Vincent, et al., 2018).

Workers with high levels of green human capital may be more creative in their approach to tackling environmental problems and coming up with eco-friendly solutions. Their knowledge and inventiveness can result in cutting-edge green initiatives and methods that enhance environmental performance as a whole (Rivaldo & Nabella, 2023). Green Human Capital has the tools necessary to minimize waste and energy use while maximizing resource utilization.

A workforce that has access to green human capital is more suited to maximize resource utilization, which lowers energy and waste output. An organization's financial and environmental performance can benefit from this increased resource efficiency. According to Roscoe et al. (2019), one source of strategic resource is human capital since it provides the skills necessary to implement plans and procedures that guarantee businesses' survival in the fast-paced business world of today.

The organization's green agenda is advanced by employees who possess green human capital, and actively participate in green activities. There is a perception that organizations with more green human capital are likely to benefit more from it as a result of their innate environmental knowledge and abilities (Yong et al., 2019). They encourage environmentally friendly practices, actively engage in sustainability initiatives, and improve the organization's overall social and environmental performance. According to Allameh (2018), Among intangible assets, human capital

is the most significant and enhances both business success and employee happiness. The workforce's skills, particularly their knowledge and understanding of environmental issues, have a direct bearing on the organization's ability to embrace and put into practice sustainable methods. If the firm's workers possess eco-friendly competences and abilities (Yong et al., 2020), the company will be able to decrease the damaging consequences that its activities have on the environment.

The company's green performance can be enhanced by the involvement of environmentally conscious personnel. One of the key elements that determines how well a firm performs is its human capital. According to Khusnah and Soewarno (2024) a company's performance increases with its human capital. The success of GMOs depends heavily on human resources' zeal. The implementation of a strategy, including the transgenic strategy to boost the company's performance, is highly influenced by the preparation of the human capital of the organization (Miyagi et al., 2019). According to organizational science, one of the key elements that should be incorporated into green HR practices and management in order to embrace environmental protection policies is green human capital (Yong et al., 2019). Through the effective execution of green initiatives, staff members who possess a high degree of environmental consciousness and knowledge about sustainable practices instantly enhance the company's green performance. According to Shoaib et al. (2021), employee commitment to embracing green practices enhances corporate performance, success, and environmental sustainability.

The resource-based vision (RBV) also explains the relevance and value of green human capital and reports on how it assisted businesses in achieving sustainability and competitive advantage. Considering the importance of "green human capital, it should be clarified that this term refers to an employee's knowledge, abilities, dedication, and inventiveness with regard to environmental preservation. Later on, it was verified that concentrating on GHC contributed to increased productivity and a skilled staff. Human resources should be non-replaceable from an RBV perspective in order to provide organizations a competitive edge. Human capital is entrenched in people and leaves organizations when they change positions (Allameh, 2018). Since it improves employee performance, job satisfaction, and organizational effectiveness, Among intangible assets, human capital is the most

significant. [Yong et al. \(2019\)](#) argued that training exercises may help build green qualities. Thus, human capital supports the execution of green initiatives and the identification of an organization's intangible assets. [Allameh \(2018\)](#) outlined how a stronger emphasis on GHC would lead to larger green organizations since employees with better environmental knowledge and awareness would be more competitive. In order to provide organizations a competitive edge over rivals, resources should be unique, uncommon, non-comparable, and non-substitutable, according to the RBV point of view. Employees will have their GHC deleted when they leave with this information as it is ingrained in them. Such capital should be attempted to be retained by the organization ([I. Williams Jr, L. Morrell, & V. Mullane, 2014](#)). Studies conducted in the past ([C.-J. Chen & Huang, 2009](#)) said there was a direct correlation between green human capital and sustainability. Organizations' sustainable environments are significantly shaped by the incorporation of green practices into management. According to [Kim et al. \(2019\)](#), these environmentally friendly methods have an impact on workers' conduct, encouraging a pro-environmental mindset and eventually improving environmental performance. This emphasizes how important management is to advancing sustainability programs and fostering an environmentally conscious culture. [Tjahjadi et al. \(2023\)](#) have observed that human capital is a crucial element in generating economic value and enhancing the performance of companies. Employee knowledge, abilities, and experience are all included in human capital, which is crucial for fostering innovation, productivity, and competitiveness in businesses. Through training, education, and collaborative methodologies, firms may invest in the development of their human resources, resulting in improved performance and sustained growth.

The claim stated by [Khusnah and Soewarno \(2024\)](#) that there is a positive relationship between firm performance and preparedness for human capital highlights the critical role that human capital plays in fostering organizational success. An organization's ability to advance and improve its green performance depends heavily on its human capital, which includes workers' knowledge, skills, and experience. This is especially true when the organization has access to environmental information and expertise. Workers that are aware of environmental issues and have a

good understanding of them are more likely to be involved in green projects, come up with creative sustainable solutions, and help maximize resource use while reducing waste. Organizations may harness the creative potential of their workforce to provide novel solutions that improve environmental performance by educating employees about sustainability and environmental awareness. [Singh and Pandey \(2020\)](#) emphasize how crucial it is for businesses to fund environmental education and training programs in order to provide their employees with the skills and information they need. Through these programs, staff members may share ideas, work together on environmentally friendly projects, and provide shrewd suggestions for the successful adoption of environmental policies inside the company. Through the promotion of an environment that values ongoing education and information exchange, companies may leverage the combined skillset of their workforce to achieve favorable environmental results.

According to [Yusliza et al. \(2020\)](#), obtaining sustainability requires intangible assets including knowledge, skills, talents, creativity, wisdom, experience, attitude, and employee commitments. Their combined efforts have the potential to increase the organization's overall Green Performance, compliance with green standards, and environmental stewardship. Green human capital influences positive changes in employees' attitudes towards energy use and raises understanding of environmental issues ([Elshaer et al., 2021](#)). Essentially, green human capital acts as a stimulant to encourage a positive attitude change among employees. This, in turn, helps to forge a group commitment to acting in an environmentally responsible manner and, in the end, propels an organizational culture that is more energy-efficient and sustainable, leading to improve green performance for the company.

Higher skill and competence levels are critical for success in organizations, according to [Rabialdy \(2019\)](#). Higher educated and trained individuals often demonstrate higher productivity and get bigger rewards from their contributions to the organization. This demonstrates how crucial it is to fund efforts aimed at developing human capital through education, training, and skill-building in order to improve individual capacities and boost organizational performance. In a similar vein, [Cleary and Slavkovic \(2018\)](#) offer factual data in favor of the positive correlation between organizational success and human capital. According to their

study, companies that have greater levels of human capital—that is, individuals who are talented and educated—also often have better performance results. While [Rabialdy \(2019\)](#) found a positive affiliation between human capital and organizational performance, this emphasizes the strategic role of human capital in enhancing organizational success and competitiveness. According to [Yong et al. \(2019\)](#), the most significant component of intangible assets that enhances work satisfaction and boosts a company's performance is green human capital. Workers that possess green knowledge and abilities are frequently more engaged and content in their positions. Pursuing environmentally friendly objectives gives one a sense of fulfillment and purpose. According to [Acquah, Agyabeng-Mensah, and Afum \(2020\)](#), human capital is essential to improving the sustainability of businesses. When staff members are knowledgeable about sustainable practices, they may actively participate in developing and implementing environmentally friendly strategies, which helps the company's environmental performance.

Employee knowledge and abilities enable them to put initiatives into action that lessen environmental effect and support sustainable business practices. According to [Malik et al. \(2020\)](#), human capital may assist staff members in boosting output, reducing material waste, and fostering sustainable performance inside companies. Workers who are knowledgeable about green practices are better able to see areas for development and put plans in place to increase productivity while reducing environmental impact. Employees support the organization's broader sustainability goals by using their expertise and abilities.

In actuality, GHRM is crucial to the successful expansion and corporate greening ([Nejati et al., 2017](#)). Apart from the evident environmental advantages, GHRM is a crucial part of business management since it increases a company's attractiveness and aids in personnel retention. According to [Tseng, Tan, Siriban-Manalang, et al. \(2013\)](#), the "GPM" approach assesses an employee's performance based on the way they handle the environment.

Promoting an organization's eco-friendly policies in order to draw in environmentally sensitive personnel is known as "green hiring." By emphasizing the organization's dedication to sustainability and how it aligns with the values of potential workers, this strategy seeks to draw talent. The goal of green recruiting is to

draw in professionals who are concerned about the environment by showcasing the company's green image (Tang et al., 2018).

The AMO hypothesis highlights the significance of giving staff members the means, incentive, and chance to participate in sustainability initiatives, hence endorsing the beneficial influence of green human capital on green performance. Employees with green human capital possess the requisite knowledge and skills about sustainability and eco-friendly activities, which improves their talents. Employees with this capacity may successfully execute environmentally conscious strategies, design sustainable solutions, and support green initiatives, all of which have a beneficial influence on green performance. Green human capital raises employee motivation by bringing employees' values into line with the company's environmental goal.

Workers that possess green talents are more likely to be innately driven to adopt eco-friendly practices and support green objectives. In addition to encouraging consistent efforts towards reaching and sustaining high levels of green performance, this incentive creates a good work atmosphere. Employers who make green human capital investments provide their staff members the chance to put their expertise in sustainable practices to use.

This entails fostering a positive work atmosphere, providing venues for green technology innovation, and incorporating sustainable practices into regular business operations. These chances enable staff members to take an active role in improving the company's environmental performance. Hence it can be hypothesized that:

H3: Green human capital has a positive impact on green performance.

2.8 Green Human Capital as a Mediator between Green HRM and Green Performance

The company's most valuable asset is its human capital (Giuliani, 2016; Matthews, 2017). Due to their significance, people are seen as an intangible asset by businesses. The company's "wealth" is its asset. Human capital is crucial to a company's success and must be preserved inside an organization. The concept of

”green human capital” may be described as ”the summation of employees’ knowledge, ability, experience, wisdom, creativities and commitments, etc. about environmental protection or green innovation, and was embedded in employees, not in organization’s” (C.-J. Chen & Huang, 2009). One of the core tenets of organizational science is green human capital, which plays a major role in the adoption of green HRM practices (Yong et al., 2019). Albloush et al. (2022) claim that human capital acts as a mediator between GHRM and organizational performance.

One of the core tenets of organizational science is green human capital, which plays a major role in the adoption of green HRM practices (Yong et al., 2019). But according to (Bon et al., 2018), GHRM creates a competitive edge that might lead to better organizational performance. Workers who use GHRM techniques in hiring, performance management, and green training are more likely to be motivated, skilled, and suited for tasks involving sustainability. The organization gains a competitive edge via efficient resource management and a reduction in environmental impact when its employees are proficient in environmentally friendly activities. With an emphasis on the growing availability of green human capital, managers should plan the scope of green operations, identify talent gaps, and offer professional training (Shoaib et al., 2021). Companies need to develop an environmental identity and image that motivates workers to priorities environmentalism if they want to draw in environmentally conscious individuals. Companies may develop a strong environmental narrative by actively supporting sustainable activities, such as lowering carbon footprints or putting in place eco-friendly regulations, according to (Guerci et al., 2016). This not only improves the company’s image but also acts as a catalyst for employees to adopt eco-friendly practices, creating an atmosphere where employees respect and embrace environmental sustainability.

Strategies for green remuneration comprise long-term goal-achieving rewards and incentives. According to Hassan and Pasha (2023), these incentives motivate employees to engage in environmental activities, enhancing their green human capital and highlighting their commitment to environmental responsibility. Green performance management is used to include environmental goals into the evaluation and feedback procedures. By aligning team and individual objectives with sustainability goals, this strategy promotes workers’ success in tasks connected to

sustainability. Employees are more likely to take part in sustainability initiatives when they are commended and recognized for their environmentally friendly work, which raises the Green Human Capital (Dixon et al., 2017). The adoption of Green HRM practices has the potential to enhance an organization's Green Performance as employees with strong Green Human Capital are better equipped to lead sustainability projects.

It has been suggested that workers' sustainability-related skills and knowledge play a major role in the adoption of green HR practices. Employee dedication resulting from green HRM entails the responsibility of implementing eco-friendly HR innovations, which raises competencies, reduces operating expenses, and boosts employee engagement (Singh & Pandey, 2020). By improving workers' skills, dedication, and motivation, workforce greening promotes a sustainable culture. Green HRM activities are translated into enhanced green performance results through the mediation of green human capital, which encourages workers to actively participate in ecologically responsible actions.

According to Elrehail et al. (2019), workforce greening is an HRM technique that aims to improve employees' general competences, motivation, and commitment in order to improve the firm's green performance. Green human resource management, or GHRM, promotes eco-friendly business practices and cultivates an eco-sustainable company culture. According to Ahmad et al. (2022), GHRM programs enable businesses to include environmental issues into their HR procedures and policies, which encourage a wider range of employees to adopt sustainable behaviors and attitudes. The congruence of HR strategy with environmental objectives fosters a corporate culture that integrates sustainability into the organization's values and operations. Green human resource management (GHRM) techniques are essential for enhancing organizational environmental performance and supporting cost-cutting initiatives, as noted by Tanveer et al. (2024). Businesses may concurrently improve their environmental effect and resource utilization by incorporating eco-friendly practices, such as encouraging energy efficiency, waste reduction, and sustainable procurement, into their HR initiatives. In addition to increasing organizational effectiveness, this alignment of HR procedures with sustainability goals upholds the business's environmental responsibilities, building a favorable

reputation and drawing in environmentally sensitive stakeholders. The relationship between GHRM practices and environmentally conscious employee behavior is particularly interesting as it provides solid insights into how companies might inspire staff to find innovative solutions to environmental issues (Farooq, Ahmed, Akbar, Aslam, & Alyousef, 2021). Training produces the environmentally conscious knowledge, behaviors, abilities, and attitudes that impact an organization's performance based on its environmental policies (Malik et al., 2020). Programs for green development and training are essential for promoting organizational and environmental sustainability. These programs provide staff members the abilities and information they need to adopt environmentally friendly behaviors, which lessens their impact on the environment and improves organizational effectiveness. They help foster a sustainable culture throughout the corporate ecosystem. Few businesses understand how important green development and training programs are for both organizational and environmental sustainability (Pradhan, 2020).

Companies should put in place thorough procedures to evaluate the purchase of resources in order to maintain improved worker performance. This entails creating open procedures for assessing how resources are allocated, making sure that these procedures are in line with strategic goals, and cultivating an efficient and accountable culture at all organizational levels. Organizations must establish corporate-wide procedures to assess resource acquisition if they hope to sustain increased staff performance (Tulsi & Ji, 2020). In order to maintain people in the green program and to acknowledge their organization, green rewards might include the use of work environment and way of life perks, such as carbon credits or free bikes (Suharti & Sugiarto, 2020). Businesses are beginning to recognize the value of green hiring and selection, and HR managers are becoming increasingly interested in luring and keeping exceptional workers especially those who care about the environment. Although this is a difficult process, businesses have realized how important it is (Yong et al., 2019).

Choosing employees that are deeply committed to sustainability is important when discussing green human resource management (GRM). By actively supporting eco-friendly activities and fostering an environmental stewardship culture, this method also contributes to the development of green human capital, which in turn serves

to mediate the connection between green HRM practices and the organization's green performance results. "Green selection" is the process of selecting competent workers who have the drive and dedication to effect positive change and support environmental management initiatives inside businesses, according to [Tang et al. \(2018\)](#).

In keeping with the principles of green human resource management (GHRM), this recruiting approach is crucial to creating an organizational culture that is sustainable and ecologically aware. Previous research shows a link between green practices and people's motivation, competency, and engagement ([Alzgoool, 2019](#)). By fostering dedication to sustainability objectives, boosting productivity, stimulating innovation, and creating a healthy organizational culture, these characteristics also have a beneficial effect on green performance. According to [Longoni et al. \(2018\)](#), GHRM practices encourage environmentally conscious staff and make it possible for businesses to run more sustainably and ecologically.

Organizations may guarantee that sustainability goals are ingrained at every stage of the employee lifecycle, from hiring and selection to training and development, by incorporating environmental concerns into HR policies and practices. According to the AMO (Abilities, Motivation, and Opportunity) hypothesis, an employee's performance is influenced by their motivation, opportunity, and talents taken together.

According to this theory, companies may develop their Green Human Capital by providing chances for workers to participate in green projects, enhancing employees' skills via training, and motivating them by praising and rewarding green behavior. It is used in conjunction with green human resource management (GHRM) techniques for hiring, training, paying employees, and managing performance. This green human capital, in turn, mediates the relationship between green HRM practices and green performance and, ultimately, enhances organizational environmental performance by embodying the knowledge, skills, and commitment of workers to environmental sustainability. Hence, the study makes the following hypothesis:

H4: Green human capital mediates the relationship between green HRM and green performance.

2.9 Agile Leadership Moderates the Relationship between Green HRM and Green Human Capital

According to [Akkaya \(2020\)](#) agile leaders are examples for their followers, being adaptable, result-driven, innovative, and open to change. In addition, they follow the competition and the market with innovation. They decide on a future vision, make plans to realize it or the organization's goals, empower and inspire others who follow them to achieve this vision, and offer them psychological stability. While a lot of study has been done on the link between Green HRM and the expansion of Green HRC, not much has been written about how Agile Leadership affects this relationship ([Haldorai et al., 2022](#)). The work environment and agile leadership have an impact on millennial employees' success ([Setiawati, Wahyuhadi, Joestandari, Maramis, & Atika, 2021](#)). This fosters a dynamic and engaging workplace where millennial feel valued, motivated, and empowered to contribute their best. This ultimately leads to increased productivity, innovation, and overall employee success.

Agile leaders are extremely flexible and change responsive. According to [Eisenbeis et al. \(2018\)](#), they welcome ambiguity and are prepared to modify their plans and tactics as necessary to meet changing objectives and obstacles. Agile leaders are renowned for their capacity to adjust to shifting conditions and successfully take on novel tasks. Agile Leadership may serve as a moderating factor in the context of Green HRM and Green Human Capital by modifying the organization's HR procedures to better match with sustainability objectives and foster the creation of Green Human Capital. Although there are still barriers to implementing an agile strategy in businesses, agile development initiatives can benefit from servant leadership and agile leadership practices ([Neto, Penha, da Silva, & Scafuto, 2022](#)).

Agile leadership is defined by qualities like empathy, growth orientation, and cooperation. It makes it easier to link green human capital with green HRM by encouraging employee well-being, enabling sustainable behaviors, and building collaboration—all of which are especially important in unpredictable settings. Leaders who

readily adjust to new developments demonstrate traits like teamwork, empathy, and concern for their own and their subordinates' growth to accomplish shared objectives, especially in situations when uncertainty prevails (Özdemir, 2023). Agile Leadership may operate as a link in a Green HRM environment, where businesses are adopting eco-friendly HR procedures. Employees are more receptive to accepting and internalizing Green HRM efforts in an atmosphere where agile leaders' collaborative and empathic attitude is fostered. Agility at the organizational level is greatly facilitated by strong leadership. The driving force behind a person's personal trajectory is their experiences that inspire them to take on social endeavors. These endeavors may have as their goal the support of others going through similar difficulties as they have, or they may be connected to the necessity of changing one's lifestyle as a result of a particular experience. Lehmen, Petrini, and Silva (2023). Agile leaders create an environment where everyone's voice is heard and contributions are valued. They also empower their teams by delegating tasks effectively and providing autonomy in decision making. This empowers millennials to take ownership of their work and contribute uniquely to the team's success.

A culture of cooperation, trust, and common purpose is fostered by agile leaders (Hofman, Grela, & Oronowicz, 2023) and is essential in a sustainability setting because achieving green goals requires teamwork. Introducing agile thinking into the workplace may improve workers' speed and adaptability, raise the caliber of their work, and result in more efficient operations. One factor that affects worker performance is adaptable leadership. It is anticipated that agile leadership would increase the efficacy of green HRM procedures. Leaders who embrace agility are more likely to support and champion sustainability initiatives within the organization. Agile leadership is a type of leadership that prioritizes quickness, adaptability, and flexibility while handling change (Junita & Agilitas, 2021). Agile leaders may encourage staff to advance their environmental knowledge and skills by fostering a culture of ongoing learning and innovation. Consequently, this fosters the growth of Green Human Capital.

The Agile leadership style is derived from the Agile product development methodology, which prioritizes iterative and ongoing product development through the

use of the sprint short cycle approach (Dwita, Surapto, & Rahman, 2022). In addition to emphasizing clear and honest communication between team members and leaders, agile leadership places a strong emphasis on fostering an atmosphere that supports workers' professional and skill growth. Because it stresses the capacity to adjust swiftly to these changes, the agile leadership style is thought to be appropriate for businesses experiencing rapid and dynamic change (Attar & Abdul-Kareem, 2020). Agile leadership, known for its flexibility, unites Green HRM and Green Human Capital by incorporating environmental objectives into HR plans quickly, encouraging staff participation in sustainability projects, and guaranteeing organizational stability in the face of sudden changes. In a rapidly changing environmental landscape, agile leaders can help organizations adapt their HRM practices to stay aligned with evolving sustainability goals. Horney, Nguyen, Salvesen, Tomasco, and Berke (2016) defines a leader as agile when they can perceive changes in their surroundings and react quickly, nimbly, and with concentration. Agile leadership promotes teamwork and open communication. This creates a platform for knowledge sharing and collective problem-solving, allowing employees to learn from each other's green practices and develop better solutions together.

According to (Akkaya, 2020), agile leaders promote flexibility and creativity to secure organizational survival and competitive advantage. In their role as moderators, they facilitate the integration of green HRM and green human capital development, maximizing sustainability efforts to preserve agility and accomplish environmental objectives, ultimately bolstering organizational resilience as a whole. When it comes to organizational challenges that are seen by other members of the organization, leadership in those organizations shapes perspectives that impact members' beliefs, commitments, and goals (Ererdi & Durgun, n.d.).

Kasali (2018) discovered that agile leaders can generate strong organizational conditions, have a "must do" mentality, work well in teams, and do a number of other things when faced with uncertain scenarios. Agile leadership fosters an organizational culture of agility, which is necessary for achieving competitive advantage. Agility of the organization Agility in operations and strategy may be fueled by strong leadership. For an organization to continue being agile, to thrive,

and to continue existing, it needs agile leadership (Joiner, 2019). Agile leadership is characterized by a leader that is inventive, flexible, and highly accepting of uncertainty while simultaneously maintaining productivity and accomplishing organizational objectives (Prasongko & Adianto, 2019). Organizational leadership must be adaptable in evaluating organizational identity and figuring out how organizational identity functions in order to maintain organizational members' engagement with the organization through difficult times, uncertain times, and changing work practices (Aitken & Von Treuer, 2021). Agile leadership impacts members' commitment to environmental sustainability, aligning with green HRM and supporting the development of green human capital through the promotion of flexibility and creativity. Organizations may include sustainability goals and encourage group efforts towards resilience and environmental stewardship by having good leadership. When it comes to organizational challenges that are seen by other members of the organization, leadership in those organizations shapes perspectives that impact members' beliefs, commitments, and goals (Ereedi & Durgun, n.d.).

According to Junita and Agilitas (2021), agile leadership places a high value on quickness, adaptability, and flexibility while managing change. Agile leadership functions as a moderator in the context of green human resource management (GHRM) and green human capital, enabling the successful adoption of environmentally friendly practices inside the company. By adopting an agile mindset, executives may quickly address new environmental issues, modify HR policies to support eco-friendly projects, and cultivate an eco-aware workplace culture. Agile leadership's moderating function strengthens the relationship between green human resource management (GHRM) and green human capital, guaranteeing that organizational initiatives towards environmental sustainability are effectively planned and carried out. Employee performance is influenced by agile leadership, workload, and job satisfaction (Dwita et al., 2022).

The Abilities, Motivation, and Opportunity (AMO) theory provides a comprehensive framework to understand how Agile leadership moderates the relationship between Green HRM and Green Human Capital. First, by providing skill development programs and training efforts that are specifically designed with environmental goals in mind, Agile leadership guarantees that staff members have

the necessary skills to participate in ecologically friendly activities. Second, by emphasizing the value of sustainability and providing incentives for eco-friendly behavior, Agile leaders foster a culture of motivation among their workforce via inspiring leadership and effective communication. Thirdly, by giving staff members the tools, freedom, and support they need to get involved in green HRM activities, agile leadership fosters a sense of dedication and ownership towards the sustainability goals of the company. Agile leadership is a critical moderator in the integration of Green HRM practices and the development of Green Human Capital. It does this by bringing abilities, motivation, and opportunity within the organizational context into alignment. This improves overall organizational resilience and gives organizations a competitive advantage in an increasingly environmentally conscious business landscape. Thus, on the basis of above literature review it can be hypothesized that

H5: Agile leadership moderates the relationship between green HRM and green human capital in such a way it strengthen the relationship.

2.10 Research Model

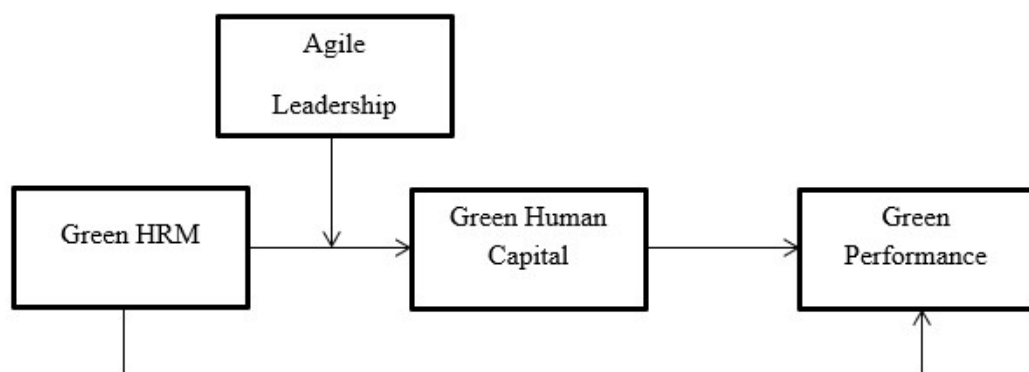


FIGURE 2.1: Research Model

2.11 Summary of Hypothesis

H1: Green HRM has a positive impact on green performance.

H2: Green HRM has a positive impact on green human capital.

H3: Green human capital has a positive impact on green performance.

H4: Green human capital mediates the relationship between green HRM and green performance.

H5: Agile leadership moderates the relationship between green HRM and green human capital in such a way it strengthen the relationship.

Chapter 3

Research Methodology

3.1 Research Design

3.1.1 Type of Study

The current study is causal in nature. Pakistan's manufacturing sector has been targeted for gathering the necessary data. The data was collected at one time only. At first, 384 questionnaires were set as a target.

3.1.2 Research Philosophy and Quantitative Research

The fundamental presumptions of research philosophy guide how the researcher interprets phenomena. Additionally susceptible to practical considerations, philosophy's choice is heavily influenced by the researcher's observations regarding the connection between knowledge and phenomena (Saunders, Townsend, et al., 2018). This study employs the deductive analysis approach, which is predicated on the determinism premise. Our theoretical assumptions have been demonstrated and supported by prior research as well as current conjectures. These have subsequently been tested empirically in order to verify the suggested hypothesis. The quantitative approach has been widely accepted and used to reach a large number of people. The information was subjected to a quantitative study in this manner. In this study, a positivist research approach was adopted to investigate the role of green HRM. Positivism is a philosophy that asserts that empirical data gained

through the senses is reliable and true knowledge originates from measurements and observations. Furthermore, it emphasizes that all observers must provide a description of something that is substantially the same for genuine knowledge to be assumed. The speculative deductive method formerly served to support positivism. Researchers asserts that positivist studies of ideal models are of importance to researchers in the social sciences. In positive research logic, the quantitative investigation of the technique's viewed as the best course of action.

3.1.3 Research Design

The present study examined how green HRM affects outcome variables; the study follows a survey based research design for data collection.

3.1.4 Quantitative Research

The research and findings of the current study are based on data collected from respondents through questionnaires, making it measurable. The data has been evaluated using a variety of statistical methods and tools.

3.1.5 Cross Sectional Study

It is a cross-sectional study. Respondent data from cross-sectional research is only collected once and utilized to inform subsequent research endeavors.

3.1.6 Unit of Analysis

For this study, the individual mid level employees were unit of analysis. The research focuses on mid-level workers who occupy a critical position in the organizational structure, acting as a bridge between entry-level jobs and managerial positions at the top. These workers usually work in middle or supervisory roles, supervising daily operations and carrying out top management's strategic directions while also advising and assisting entry-level personnel. Gaining an understanding of the viewpoints and experiences of mid-level employees is crucial

to understanding decision-making procedures, organizational dynamics, and the efficacy of management techniques used to improve performance and accomplish organizational objectives.

3.1.7 Population

The population consists of mid-level employees who are working in manufacturing sectors in Pakistan. Data was collected via online and survey methods from the people who are employed in manufacturing organizations in Pakistan. In the organizations, over 384 questionnaires were given out. Participants received assurances on the privacy of the data they submitted for the study. A 71 % response rate was achieved when 273 responses were taken into account for data analysis.

In order to receive a response right away, questionnaires were distributed both directly and online. Online data collection is also the most convenient method, according to earlier studies. Furthermore, employing any one of the two methods described above has no discernible impact on the quality of the data, regardless of the data assortment strategy (Church, Elliot, & Gable, 2001). Owing to limitations in both time and resources, the previously indicated techniques have proven highly effective in gathering data for the current study. According to the Labor Force survey 2019-20 the total number of employees working in the manufacturing sector in Pakistan is approximately 4.7million. For this study data has been collected from 15 different manufacturing companies with in Pakistan.

3.1.8 Sampling

A probability sampling technique (simple random sampling) was used. Sampling is a common method for collecting data. Sampling is the most often utilized form of data collecting because it is very difficult to collect data from the complete population due to time and resource constraints. For this reason, a certain category of working professionals was chosen since they accurately represent the intended audience. In order to conduct this study, companies that appeared to have an excessive workload were contacted, and as a result, supervisors there occasionally became more demanding of their assistants in an effort to meet deadlines. As a

result, the study's sample was chosen to be a realistic representation of the target demographic and to include all the essentials necessary to get the desired results.

3.2 Instrument

3.2.1 Measures

A structured questionnaire based on the likert scale was utilized for this study. A reliability test revealed that all of these scales were acceptable. For every variable, an earlier version of the questionnaire was employed. Through the collection of those questions, a selected analysis from multiple authorized sources provided the information. The data was collected through adopted questionnaires. The variables of the study were green HRM, green human capital, green performance and agile leadership. Questionnaires similarly comprise four demographic variables that contain information about the respondent experience, qualification, age, and gender.

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3.2.2 Green HRM

GHRM was measured by using 19-item scale developed by [Tang et al. \(2018\)](#). In this study, a uni-dimensional scale is employed to measure the various types of green HRM practices as a single construct. GHRM uses an integrated approach to assess a comprehensive array of practices, including green recruitment and selection, green training, green performance management, green compensation, and

green involvement. The sample item is "Attracting green job candidates who use green criteria to select organizations". It's a 5-point scale ranging from "1=not agree at all" to "5=totally agree".

3.2.3 Green Human Capital

A 4 items scale developed by [Chang \(2016\)](#); [Y.-S. Chen \(2008\)](#) is being used to measure the green human capital. The sample item is "The managers in the company can fully support their employees to achieve goals of environmental protection". It's a 5 point Likert scale ranging from 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree

3.2.4 Green Performance

The green performance was measured by using five items scale developed by [Laosirihongthong, Adebajo, and Tan \(2013\)](#). The sample item is "Our firm reduced the environmental impacts of its products/service". It's a 5 point Likert scale ranging from 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree

3.2.5 Agile Leadership

The agile leadership was measured by using scale developed by [Akkaya \(2020\)](#) consisting of 32 items. The sample item is "Our Leader has a strategic vision to achieve its goals". It's a 5 point Likert scale ranging from 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree

TABLE 3.1: Scales Summary

Variables	Scale	Items
Green HRM	Tang et al. (2018)	19
Green Human Capital	Chang (2016) ; Y.-S. Chen (2008)	4
Green Performance	Laosirihongthong et al. (2013)	5
Agile leadership	Akkaya (2020)	32

3.3 Statistical Tools and Techniques

Descriptive analysis was employed to identify means, STDs, min max vales. Furthermore, regression was carried. It is frequently employed for determining the effect of one variable on the dependent variable being studied. Regression analysis is a tool for examining how different factors affect the dependent variable. The [Hayes and Preacher \(2014\)](#) models 7 was used for analysis including moderation and mediation analysis.

3.3.1 Pilot Testing

Pilot testing before moving on to a larger scale data collection is a very fruitful and successful method, as it eliminates several hazards linked to money and time wasting. Therefore, a pilot study comprising of roughly fifty questionnaires was conducted to ascertain the respondents' awareness and compliance with the proposed hypothesis. Following the pilot testing, it was found that the scales were a perfect fit for additional analysis and that there were no significant issues with the variables.

3.4 Reliability Analysis of Scales Used

When an item is tested to yield consistent results or outcomes over time, it is said to have high reliability. When a scale is examined repeatedly, its ability to yield consistent findings is known as scale reliability. Internal reliability of the variables was demonstrated through a reliability test using Cronbach alpha. It demonstrated that the variables are related to one another.

A Cronbach's alpha value of 0.7 or higher is regarded as consistent, while a particular collection of constructions calculated below that threshold are regarded as less dependable. The alpha values for the construct in this study is as fellow. Green human resource (.93), green performance (.94), green human capital (.938) and agile leadership (.93). These values point to a high degree of internal consistency and imply a general close relationship between the components inside each construct. The reliability scores of our variables are justified as excellent, exceeding

the commonly accepted threshold of .70, ensuring strong internal consistency for measuring complex constructs.

TABLE 3.2: Scales Reliability

Variables	No of Item	Cronbach's Alpha
Green Human Resource Management	19	0.93
Green Performance	5	0.94
Green Human Capital	4	0.93
Agile Leadership	32	0.93

3.5 Sample Characteristics

The demographic variables in the study were the employee's age, gender, qualifications, and experience. The details of the sample characteristic are as follows:

3.5.1 Gender

Even though this study made an effort to guarantee gender equality, it was found that there are significantly more male employees than female employees. Table 3.3 represents the ration of male and female employees, where we observed that 70.7% of respondents are male and 29.3 % are female.

TABLE 3.3: Frequency by Gender

Gender	Frequence	Percentage	Cumulative
Male	193	70.7	70.7
Female	80	29.3	100
Total	273	100	

3.5.2 Age

For the purpose of being accessible to respondents, age information was gathered in ranges. Age is imitated as one of the demographics, which respondents occasionally

find agonizing to reveal amicably. It has been shown in Table No. 3.5.2 that most of the respondent's having the ages between 20-30, that, that means 52.4% of the majority of the respondents were having age between 20-30, 31.5% having age ranging between 31-40, 8.7% of the respondents having age ranging between 41-50 & 7.3% of the respondents having age ranging between 51 above.

TABLE 3.4: Frequency by Age

Age	Frequency	Percentage	Cumulative
20-30	143	52.4	52.4
31-40	86	31.5	38.9
41-50	24	8.7	92.7
51 and Above	20	7.3	100
Total	273	100	

3.5.3 Qualification

The key to a country's prosperity and growth is education, which is also a prerequisite for success on a global scale. Qualification is a passionate aspect of the population because education creates a number of unique and fresh avenues for accomplishment. It has been presented in Table No 3.5.3 most of the respondents were qualifying for bachelor's level. Comprises 54.6% of the whole respondents designated as the true illustrator sample of the whole population. 22.3% of the respondents were qualifying for master's level, 5.5% of the respondents were qualifying for MS/PhD, 15.8% of respondents were qualifying for Intermediate and 1.8% of the respondents were qualifying for others.

TABLE 3.5: Frequency by Qualification

Education	Frequency	Percentage	Cumulative
Intermediat	42	15.8	15.8
Bachelors	149	54.6	70.3
Master	61	22.3	92.7
MS	15	5.5	98.2
Any others	5	1.8	100
Total	273	100	

3.5.4 Experience

Different types of experience time have been identified in order to gather information about the respondents' experiences. This allows each respondent to easily ascertain the precise duration of their experience in the relevant field. It has been observed from Table No.3.4 stated the majority of responders had experiences that ranged from 2-5 years. Which signifies that 40.7%, 20.1% of the respondents having the experience ranging 5-10 ,32.6% of the respondents having the experience between 0-1 years and 6.6% of the respondents were having the experience 10 years and above.

TABLE 3.6: Frequency by Experience

Experience	Frequency	Percentage	Cumulative
0-1	89	32.6	32.6
2-5	111	4.7	73.3
5-10	55	20.1	93.4
10 and Above	18	6.6	100
Total	273	100	

Chapter 4

Result and Analysis

Using programs like SPSS, descriptive statistics, Pearson correlation, moderation, and mediation were carried out to look at the results concerning all the variables.

4.1 Descriptive Analysis

Using a variety of statistical techniques, descriptive statistics provide an overview of the observed details that are extracted from the data. Descriptive statistics of each variable such as Green human resource, green performance, green human capital and agile leadership . SPSS was used to determine the means and standard deviations; the results are shown in Table 4.1 below. Greater agreement among respondents is shown by higher mean values, whereas greater disagreement among respondents is indicated by lower mean values.

TABLE 4.1: Descriptive Analysis

Variables	N	Min	Max	Mean	Std
GHRM	273	1	5	4.5	0.49
GHC	273	1	5	4.2	0.89
GP	273	1	5	3.9	0.92
AL	273	1	5	4.4	0.53

Table 4.1 Shows information regarding variables, the independent variable (green human resource management has mean value of 4.57 and the stranded deviation

is .49. The mean value of dependent variable (green performance) is 3.98 with the standard deviation of .92. The moderator (agile leadership) has a mean value 4.48 with the standard deviation of .53. The value of the mean of mediator (green human capital) is 3.98 with standard deviation of .92

4.2 Control Variables

For control variables, an ANOVA test was performed using SPSS. One-way ANOVA was primarily used to determine whether demographic factors had any bearing on the dependent variable, which in this case was project success. Therefore, our main goal is to see the positive relationships that the model forecasted and their effects. All demographic factors were found to be insignificant on the dependent variable, allowing for the independent testing of the suggested correlations, according to the research.

TABLE 4.2: One-way ANOVA

Control Variables	F	sig
Gender	0.08	0.35
Age	0.75	0.52
Qualification	0.37	0.83
Experience	1.4	0.22

4.3 Correlation Analysis

Correlation analysis is used to determine the correlation between variables. Positive signals show that the variables are moving in the same direction, whereas negative signals show that they are moving in the opposite way. Additionally, the value of "r" indicates how strong the relationship of variable. A weak correlation is indicated by a Pearson Coefficient value range of .1 to .3, a moderate correlation is indicated by a value range of .3 to .5, and a high correlation is indicated by a value bigger than .5. The correlation value illustrates many effects.

Analysis of correlation 4.3 shows coefficient between green hrm and green performance is 0.573^{**} at $p < 0.01$ indicating a positive correlation. This means higher level of green hrm is associated with higher level of green performance. Green human capital is a mediator between green hrm and green performance. The Correlation between green hrm and green human capital is 0.524^{**} at $p < 0.01$ respectively. It suggests positive correlation. It implies high level of green hrm associated with high level of green human capital additionally, agile leadership moderates the relationship between green hrm and green human capital. The correlation coefficients between green hrm and agile leadership under $r = 0.469^{**}$ at $p < 0.01$. It means these have positive correlation. More over agile leadership and green performance with $r = 0.558 < 0.01$

TABLE 4.3: Correlation Analysis

Variables	GHRM	GP	GHC	AL
GHRM	1			
GP	.573**	1		
GHC(Med)	.524**	.576**	1	
AL(Mod)	.469**	.558**	.456**	1

Over all table 4.3 shows that green HRM has been positively correlated with green performance, green human capital and agile leadership

4.4 Regression Analysis

Regression analysis, more especially multiple regression, was used in the study to look into the underlying causes of the observed connections between the variables. Regression analysis, as opposed to correlation analysis, which just finds correlations, enables researchers to evaluate the influence of independent variables on the dependent variable while accounting for other variables. The study used Hayes, (2013).

Regression analysis is conducted using a variety of methods and instruments, including the (Hayes & Preacher, 2014) full scale, which is examined for mediation

and moderation using SPSS. Table 4.4 presents a comprehensive summary of our findings, including the significant levels of the proposed hypotheses. It provides essential information such as regression coefficient values, significance values, standard errors (S.E.), lower and upper limits of the confidence interval (LLCI and ULCI, respectively). Within the table, both direct and indirect relationships are presented, with specific focus on mediation. For the regression analysis, Hayes' model 7 was utilized.

Hypothesis 1: Green HRM has a positive impact on green performance.

The regression analysis for hypothesis 1 indicates that a significant positive relationship exists between green HRM and green performance. The β value or regression coefficient is .53 whereas the p-value is .00. The positive sign coefficient β indicates the positive relationship, and the .00 p-values indicate that the relationship is significant. It means with an increase in green hrm will directly affect the green performance. Based on these findings hypothesis 1 is accepted.

Hypothesis 2: Green HRM has a positive impact on green human capital.

The regression analysis demonstrates the relationship of green HRM and green human capital. The value of coefficient $\beta = .269$ with a positive sign means there is a positive relationship between both variables. Furthermore, the p-value for this link is 0.00, which means that this relation is significant. Hence these results validate the acceptance of the hypothesis 2.

TABLE 4.4: Direct and Indirect Effect

Direct Effect	B	S. E	P	LLCI	ULCI
GHRM \rightarrow GP	0.53	0.10	0.00	0.32	0.74
GHRM \rightarrow GHC	2.69	0.45	0.00	1.79	3.59
GHC \rightarrow GP	0.42	0.06	0.00	0.30	0.54
Indirect Effect	B	S.E		LLCI	ULCI
GHRM \rightarrow GHC \rightarrow GP	0.24	0.87		0.91	0.42

Hypothesis 3: Green human capital has a positive impact on green performance.

The findings show that the regression coefficient for this association is $\beta = .42$, which is positive and has a p-value of 0.00. This demonstrates that green performance and green human capital have a positive relationship. The acceptance of hypothesis 3 is validated by the fact that green performance increases with green human capital.

Hypothesis 4: Green human Capital mediates the relationship between green HRM and green performance

The results of the regression analysis demonstrate a link between green human capital and green performance, with a β value of .24 and a p-value of 0.00 for green human capital in this relationship. The positive number indicates that green performance and green human capital are mediated by green human capital. It means in the presence of green human capital positive relationship of will be strengthened. In this case, the p-value is 0.00 which proves to be a significant positive relationship among variables and leads us towards the acceptance of hypothesis 4. additionally the upper and lower limit are in same direction, strengthen the assumption that hypothesis has been supported.

4.5 Moderation Analysis

H5: Agile leadership moderates the relationship between green HRM and green human capital. The moderation analysis examined the relationship between green HRM and green human capital., and specifically tested whether agile leadership moderates this relationship. The coefficient for Int1 is 0.44.

TABLE 4.5: Moderation Effect

Moderator Variable : Agile Leadership	B	S.E	LLCI	ULCI
Int-1 GHRM * GHC	-.22	.10	-.43	-.02

Our study results states that agile leadership does not moderate the relationship between green human resource management and green human capital, suggesting

that increasing agile leadership weak this relationship. Based on the coefficient -.22, it can be suggested that agile leadership undermines the connection between green human resource management and green human capital. We assumed that it would strengthen the relationship but contrary to our assumption it weakens the relationship. Therefore, based on the results, it is suggested that our hypothesis is not supported by the findings of the moderation analysis.

4.6 Summary of Hypotheses

TABLE 4.6: Summary of Hypothesis

Hypothesis	Statement	Results
H1	Green HRM has a positive impact on green performance	Accepted
H2	Green HRM has a positive impact on green human capital	Accepted
H3	Green human capital has a positive impact on green performance.	Accepted
H4	Green human capital mediates the relationship between green HRM and green performance.	Accepted
H5	Agile leadership moderates the relationship between green HRM and green human capital in such a way it strengthen the relationship.	Not Supported

Chapter 5

Discussion and Conclusion

5.1 Discussion

The main results of research's proposed model are described in this chapter. This chapter clarifies the consequences of hypothesis analysis by referencing relevant prior studies in the subject. The chapter's argument was hampered by the implications for theory and practice, the study's limitations, the many references to leadership qualities, and the suggestions and proposals for more research in the end. The current study's main objective was to start considering the connection between green performance in the industrial sectors and green HRM. All hypotheses are completely reviewed as under:

5.1.1 Hypothesis No. 1

H1: Green HRM has a positive impact on green performance.

Green HRM is favorably correlated with green performance, as Hypothesis 1 shows. According to the hypothesis's results, there is a noteworthy and favorable correlation between green HRM and green performance. The findings offer compelling evidence in support of the study's hypothesis, H1. Green performance is significantly impacted by green HRM. GHRM enhances the performance of green businesses (C.-J. Chen & Huang, 2009). GHRM practices may help organizations achieve long-term sustainability and alignment with environmental goals, which

can positively affect green performance. Environmental management research has shown a clear and beneficial correlation between GHRM and environmental performance (Roscoe et al., 2019).

Our hypothesis is validated by the literature and shows that the existence of a green HRM inside an organization positively and encouragingly affects creative green performance. Green human resource management, or GHRM, integrates environmental sustainability into a range of HR responsibilities with the goal of enhancing organizational sustainability and environmental performance.

According to (Karatepe et al., 2020), green employee participation is a motivator or indicator that affects the results of green organizational performance. In order to draw applicants who exhibit a dedication to environmental stewardship and have the necessary abilities for achieving sustainability goals, recruitment and selection procedures have been modified. Training and development are designed to give staff members the skills and information they need in areas like waste management and energy efficiency.

Incentives for taking part in green activities and reaching sustainability objectives are part of compensation and reward packages. Performance management systems assess workers' contributions to environmental objectives and offer appropriate feedback. Green participation programs create a sustainable culture inside the company and motivate employees to participate in environmental projects. According to the study, green HRM was present in manufacturing organizations, which is why green performance improved within those organizations.

The ability, motivation, and opportunity (AMO) serves as the foundation for the efficacy of green HRM in promoting favorable effects on green performance. Green HRM guarantees that people are equipped, motivated, and empowered to support sustainability initiatives within the company by nurturing motivation through rewards and a positive work environment, improving employees' skills through focused training and development, and offering plenty of opportunities for participation in eco-friendly activities.

A favorable environment for improved green performance is created when organizational support, individual motivation, and organizational skills are aligned, leading to sustainable results in all areas.

5.1.2 Hypothesis No. 2

H2: Green HRM has a positive impact on green human capital.

Hypothesis 2 suggest that green HRM has a positive effect on green human capital. In support of the hypothesis, the data illustrate a significant and favorable association between green human capital and green HRM. Green human capital, or skilled and ecologically conscious workers, positively affects green performance. Green human capital promotes eco-friendly innovation, resource conservation, and sustainable practices, all of which eventually improve the company's environmental performance. Organizations that priorities the creation of environmentally conscious cultures through education, training, and other means of green human capital development have shown significant improvements in their green performance ([Abreu et al., 2022](#)).

According to Smith and Brown (2019), an organization's green performance may be significantly enhanced by having green human capital, as it can foster a sustainable culture, encourage innovation, and ensure compliance with environmental regulations. Research has indicated that green human capital and green HRM have good relationships. When used skillfully, it may benefit green human capital that is, employees' environmental sustainability-related knowledge, skills, and behaviors in a number of ways. Through a variety of techniques, Green Human Resource Management (GHRM) has a beneficial influence on green human capital. GHRM incorporates environmental standards into recruiting and selection processes to draw applicants who share its commitment to sustainability.

Programs for training and development center on environmentally friendly methods, improving staff members' abilities to reduce waste and use less energy. Benefits and compensation plans encourage environmentally conscious behavior and promote a sustainable society. [Haldorai et al. \(2022\)](#) suggest that green human capital may benefit from GHRM. By incorporating environmental measurements, performance management honors and rewards contributions made towards sustainability goals. Green engagement programs foster a workforce that is dedicated to environmental responsibility by encouraging employee participation in environmental projects. When combined, these GHRM techniques create Green Human

Capital, which is essential to attaining environmental performance and organizational sustainability. Overall, encouraging a sustainable culture inside the company, giving workers the tools they need to effectively contribute to environmental goals, and encouraging group action towards a more sustainable future are the ways that green HRM benefits green human capital. The analysis demonstrates that a rise in GHRM causes a rise in GHC in the industrial sector.

According to AMO theory, improving employees' skills, motivation, and chances for eco-friendly behavior has a beneficial effect on green human capital in green HRM. This entails educating staff members about environmentally friendly behavior, inspiring them to participate in sustainability initiatives, and offering chances for them to support environmental objectives. The staff that emerges from these initiatives is knowledgeable, driven, and committed to advancing sustainability throughout the company, therefore enhancing its Green Human Capital.

5.1.3 Hypothesis No. 3

H3: Green human capital has positive effect on green performance.

Hypothesis 3 shows that green performance is positively impacted by green human capital. The theory is supported by the data, which show a strong and positive correlation between green performance and green human capital. Green human capital, or the environmental sustainability-related knowledge, skills, abilities, and behaviors of employees, may have a significant positive impact on green performance inside an organization. Because of their intrinsic environmental knowledge and skills, organizations with greater green human capital are likely to profit from it more (Yong et al., 2019). The achievement of environmental sustainability goals and the overall environmental performance of the company are related to green performance. Studies show that green human capital has a favorable effect on green performance.

According to (Allameh, 2018), human capital is the most important intangible asset and enhances both business success and employee happiness. GHC influences employees' behaviors and attitudes towards sustainability. Employees who value environmental responsibility are more likely to adopt and promote sustainable

practices within the organization, such as energy conservation, waste reduction, and eco-friendly purchasing decisions, which positively impact green performance. Green human capital fosters the creation and use of environmentally friendly procedures and technologies that result in the green performance of the company, which improves creativity and problem-solving skills.

Employees with high levels of GHC are often more engaged and empowered to participate in environmental initiatives. Employees are more likely to take ownership of green goals and actively work towards attaining them when they feel respected, encouraged, and empowered to contribute to sustainability initiatives. This results in higher green performance. Organizations may achieve sustainable growth and generate value for both society and the environment by investing in the training and empowerment of personnel with green skills and competences.

According to the AMO, improving employees' skills, motivation, and chances to do environmentally responsible actions has a beneficial effect on green human capital in green human resource management. Employees drive green performance when they are given the tools they need, encouraged to participate in sustainability initiatives, and given chances to help achieve environmental goals. This alignment produces a workforce that is not only aware of the environment but also actively involved in sustainability-related projects, which eventually improves the green performance of the organization.

5.1.4 Hypothesis No. 4

Green human capital mediates the relationship between green HRM and green performance

The results show that green human capital acts as a mediator in the relationship between green performance and green human capital.

Human capital is said to act as a mediator between GHRM and organizational green performance by (Albloush et al., 2022). The connection between green performance and green HRM practices is mediated by green human capital. Employing green HRM strategies helps companies develop their employees' green human

capital through training, environmental awareness initiatives, and the development of a sustainable culture. Employees are more equipped to take on green initiatives and push for environmental changes inside the company as they gain greater knowledge and expertise in environmental sustainability. Because green human capital acts as a mediator, green HRM practices positively affect green performance. With an emphasis on the growing availability of green human capital, managers should plan the scope of green operations, identify talent gaps, and offer professional training (Shoaib et al., 2021).

Strong green human capital enables workers to recognize possibilities for environmental development, develop innovative solutions, and carry out green projects with efficiency. Rewards encourage staff members to take an active role in environmental activities, strengthening their Green Human Capital and promoting their dedication to environmental responsibility (Hassan & Pasha, 2023).

Green HRM practices that prioritize employee involvement and empowerment create a sense of ownership and responsibility among employees towards sustainability goals. When employees feel valued, empowered, and included in decision-making processes related to environmental initiatives, they are more likely to actively engage in efforts to improve Green Performance.

Organizations may utilize their human capital to promote good environmental impact and meet sustainability goals by investing in the knowledge, skills, and attitudes of their workers about environmental sustainability. This integrated approach ensures that sustainability principles are embedded in organizational culture and practices, leading to holistic and enduring environmental performance improvements.

According to AMO theory, green HRM programs build Green Human Capital by improving workers' skills, motivation, and chances to participate in eco-friendly activities. This, in turn, makes it easier to translate Green HRM initiatives into enhanced Green Performance by guaranteeing that staff members have the tools, motivation, and authority necessary to successfully contribute to sustainability objectives.

Green HRM practices and their favorable effects on the sustainability performance of organizations are therefore mediated by green human capital.

5.1.5 Hypothesis No. 5

H5: Agile leadership moderates the relationship between green HRM and green human capital

The findings of Hypothesis 5 indicate that there is no moderating effect of agile leadership on the association between green HRM and GHC. Agile leadership is a method that combines these abilities, combining effective leadership and organizational flexibility, promoting teamwork, making timely and flexible choices, and adjusting to technology developments ([Şahin & Alp, 2020](#)). Agile leaders have a critical role in making sure that GHRM principles are successfully applied and adjusted to the changing sustainability context. An agile leader, according to [Bushuyev et al. \(2021\)](#), is someone who takes down obstacles so that teams may accomplish their objectives and provide value to the project.

Agile leadership, according to [Abbasi and Ruf \(2020\)](#), requires a new way of thinking about and seeing leadership. It is apparent that little is known about the impact of agile leadership on this relationship in the literature ([Haldorai et al., 2022](#)). Agile leadership is a management style that prioritizes cooperation, adaptation, flexibility, and change-responsiveness. Agile leadership may not always be able to manage the link between green human capital and green HRM in the context of environmental sustainability, even if it may be useful in fostering organizational change and innovation in a variety of situations.

Although agile leadership can encourage innovation, its emphasis on processes over content, lack of attention to environmental sustainability, complexity of Green HRM practices, and differences in organizational context and culture may prevent it from directly moderating the relationship between Green HRM and Green Human Capital. In order to achieve their unique sustainability aims and objectives, organizations aiming to advance environmental sustainability may need to supplement agile leadership with specialized Green HRM strategies and initiatives. According to AMO theory, agile leaders provide flexible support for the growth of workers' skills, drive, and environmental action opportunities in the framework of green HRM programs. Agile leaders facilitate the efficient execution of green HRM practices, thus augmenting Green Human Capital, by their adoption of

adaptability, cooperation, and promptness. But the findings revealed that employees sometimes take agile leadership negative, they might feel comfortable with traditional leadership style, this strict command and control may give a negative vibes and as a result green HRM might not be able to build green human capital. The findings are unique in Pakistani context and would give a new theoretical perspective demanding more flexible approach in multiple sectors.

5.2 Theoretical Implications

The use of Green HRM practices in Pakistan's manufacturing sector involves strategically aligning HR procedures with sustainability objectives to promote organizational transformation towards environmental stewardship. Embedding a culture of sustainability into manufacturing enterprises requires the implementation of initiatives including eco-friendly recruiting, extensive training on sustainable practices, and performance assessments based on environmental criteria.

Incentives for staff members to incorporate eco-friendly practices into their everyday workdays as well as training courses on waste management, energy efficiency, and environmental compliance may fall under this category. Employees in Pakistan's industrial sector have information, skills, and attitudes about environmental sustainability through Green HRM practices. They would get a greater understanding of how their actions affect the environment and be more prepared to support green initiatives inside their organizations.

Green HRM and Green Performance would be mediated by this growth of Green Human Capital. To effectively respond to environmental concerns, agile leadership in Pakistan's industrial sector would include cultivating a culture of flexibility, adaptation, and collaboration. Employees led by agile practitioners would be empowered to find areas for development, try out novel concepts, and put creative fixes into practice in order to improve environmental performance. Agile leadership would make it easier to translate Green HRM principles into noticeable gains in Green Performance by adjusting the organizational context. Theoretically, the alignment of employees' ability, motivation, and opportunity to contribute to green goals determines how effective environmental sustainability initiatives are. This

is the theoretical implication of integrating the AMO theory into the relationship between Green HRM, Green Human Capital, Green Performance, and Agile leadership. Green HRM methods help people become more capable and motivated to engage in sustainable behaviors, and agile leadership modifies the organizational environment to support their creativity and active participation.

Through an understanding of how workers' skills, incentives, and opportunities interact to drive environmental performance, organizations may create comprehensive sustainability plans that support agile leadership concepts, use Green HRM practices, and nurture Green Human Capital. This integrated strategy improves organizational resilience, competitiveness, and long-term sustainability in addition to improving environmental performance.

5.2.1 Practical Implications

Businesses should create integrated sustainability plans that incorporate agile leadership concepts, green human resource management techniques, and green human capital development. To achieve continual improvement in environmental performance, this entails coordinating HR procedures with environmental objectives, funding staff training and development about sustainability, and cultivating a collaborative and adaptable culture. The use of training programs and capacity-building activities to improve staff members' knowledge and abilities regarding environmental sustainability are examples of practical consequences. Workshops, seminars, and online courses on subjects like waste management, energy saving, and environmental legislation compliance may be part of this. Organizations may cultivate a proficient workforce that can successfully contribute to green initiatives by allocating resources towards employee training and development. Employers should provide their staff members the freedom to actively engage in environmental sustainability programs and decision-making processes. Decentralized decision-making and cross-functional cooperation are two agile leadership concepts that may help employees get more involved and take ownership of sustainability projects. One way to address these practical issues is by giving staff members the chance to lead green teams, make creative suggestions, and use sustainable methods in their areas of expertise. Incorporating environmental performance data

into employee performance reviews and award programs is one of the practical consequences. Employees may be encouraged to priorities sustainability goals and coordinate their efforts with those of the company.

The use of agile leadership concepts, such adaptive performance management and real-time feedback, can improve the efficacy of performance evaluation procedures by promptly acknowledging efforts towards environmental sustainability. To increase environmental performance, organizations should promote an innovative and continuous improvement culture. This entails motivating staff members to try out novel concepts, tools, and procedures that advance sustainability goals. Agile leadership concepts that facilitate the testing and scaling of creative ideas, such fast experimentation and iterative planning, can help with this. The implementation of feedback methods to gather recommendations for improvement from employees, the creation of cross-functional green teams, and idea development workshops are examples of practical consequences. Engaging stakeholders, such as staff members, clients, vendors, and local communities, is one way to practically express the organization's commitment to environmental sustainability and get their input on green projects. By promoting trust and alignment with stakeholder expectations, agile leadership concepts like transparent communication and stakeholder cooperation may improve the efficacy of engagement initiatives. Creating sustainability forums, releasing yearly sustainability reports, and taking part in sector-wide campaigns to encourage environmental stewardship are examples of practical ramifications. Agile leadership encourages continuous learning and development, which may boost the efficacy of green human resource management (HRM) by guaranteeing that staff members are always advancing their eco-friendly behaviors and abilities, which in turn improves the eco-performance of the company.

5.3 Limitations

The findings of the study may be limited in their generalizability to other industries or contexts beyond the manufacturing industry of Pakistan. Factors such as organizational size, sectorial differences, and cultural variations could influence

the relationship between Green HRM, Green Human Capital, Agile leadership, and Green Performance in different settings. The study's findings may be influenced by the characteristics of the sample population, such as the demographic composition of employees, organizational structure, and level of environmental awareness. A more diverse or representative sample may yield different results, limiting the generalizability of the findings. The study's cross-sectional design limits its ability to establish causal relationships or capture temporal dynamics. Longitudinal or experimental designs would provide stronger evidence of causality and allow for the examination of how the effects of Green HRM, Green Human Capital, and Agile leadership unfold over time. Practical limitations such as time, budget, and access to data may constrain the scope and scale of the study. As a result, researchers may need to make trade-offs in terms of sample size, research methods, or variables included in the analysis, which could impact the robustness and validity of the findings.

5.4 Future Direction

The study opens up several promising avenues for future research. Conduct longitudinal studies to examine how the relationships between green HRM, green human capital, agile leadership, and green performance evolve over time. The investigation of causal links as well as the detection of dynamic patterns and trends in sustainability practices and results would be made possible by longitudinal research approaches. Investigate cross-cultural variations in the relationships between green HRM, green human capital, agile leadership, and green performance. Comparing organizations from different cultural contexts would provide insights into the cultural aspects that affect how well sustainability is adopted and implemented: Explore the applicability of the study's theoretical framework to different sectors beyond manufacturing, such as services, healthcare, or technology. Each sector may have unique challenges and opportunities related to environmental sustainability, which could shape the nature of the relationships between green HRM, green human capital, agile leadership, and green performance. Investigate additional mediating and moderating mechanisms that may influence the relationship

between green HRM and green performance. For example, organizational factors such as innovation climate, supply chain management practices, or stakeholder engagement strategies could serve as additional mediators or moderators in the relationship.

5.5 Conclusion

In conclusion, the study sheds light on the intricate interplay between organizational practices, employee capabilities, leadership styles, and environmental outcomes. Through an exploration of these relationships, several key insights emerge: Firstly, green HRM practices play a crucial role in fostering environmental sustainability within organizations. By integrating sustainability principles into HR processes and policies, organizations can cultivate a culture of environmental responsibility and empower employees to contribute meaningfully to green initiatives. Secondly, green human capital serves as a critical mediator between green HRM practices and green performance. Employees who possess the knowledge, skills, and attitudes related to environmental sustainability are better equipped to implement green initiatives, drive innovation, and achieve environmental goals within their organizations. Thirdly, agile leadership does not moderate in the relationship between green HRM and green performance. By understanding the synergistic effects of green HRM, green human capital, and agile leadership, organizations can leverage their human resources and leadership capabilities to enhance their environmental performance. By investing in training and development, empowering employees, and fostering a culture of agility and collaboration, organizations can drive positive environmental outcomes while simultaneously achieving business objectives and maintaining competitive advantage in a rapidly changing world. In conclusion, the study underscores the importance of integrating sustainability principles into HRM practices, developing employees' green competencies, and fostering agile leadership behaviors to promote environmental sustainability and achieve long-term success in the manufacturing industry of Pakistan, as well as in organizations across various sectors globally.

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Appendix A

CAPITAL UNIVERSITY OF SCIENCE & TECHNOLOGY
ISLAMABAD

Questionnaire

Dear respondent,

I am MS research scholar at Capital University of Science and Technology, Islamabad, I am collecting data for my thesis title: **The Impact of Green HRM on Green Performance: Mediating Role of Green Human Capital and Moderating Role of Agile Leadership**. It will take you 10 to 15 minutes to answer the questions and to provide the valuable information. I assure you that data will be strictly kept confidential and will only be used for academic purposes. To ensure anonymity, you are not supposed to write your name or name of organization anywhere in the questionnaire.

Regards,

Asma Sabir

Department of Management Sciences

Appendix**Section I**

Please provide the following information.

Education:

Intermediate	bachelors	masters	MS/PhD	Any others
1	2	3	4	5

Experience:

0-1	2-5	5-10	10-above
1	2	3	4

Gender:

Male	Female
1	2

Age:

20-30	31-40	41-50	51-above
1	2	3	4

Section 2**Green HRM:**

1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree

Items	1	2	3	4	5
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1. My organization attracting green job candidates who use green criteria to select organizations.	1	2	3	4	5
2. My organization use green employer branding to attract green employees	1	2	3	4	5
3. My organization recruits employees who have green awareness	1	2	3	4	5
4. My organization have develop training programs in environment management to increase environmental awareness, skills and expertise of employees	1	2	3	4	5
5. My organization have integrating training to create the emotional involvement of employees in environment management	1	2	3	4	5
6. My organization have green knowledge management (linking environmental education and knowledge to behaviors)	1	2	3	4	5
7. My organization use green performance indicators in performance management system and appraisals	1	2	3	4	5
8. My organization sets green targets, goals and responsibilities for managers and employees	1	2	3	4	5
9. In my organization, managers set objectives on achieving green outcomes included in appraisals	1	2	3	4	5
10. In my organization, there are dis-benefits in the performance management system for non-compliance or not meeting environment management goals	1	2	3	4	5
11. My organization make green benefits (transport/travel) available rather than giving out pre-paid cards to purchase green products	1	2	3	4	5
12. In my organization, there are financial or tax incentives (bicycle loans, use of less polluting cars)	1	2	3	4	5
13. My organization has recognition-based rewards in environment management for staff (public recognition, awards, paid vacations, time off, gift certificates)	1	2	3	4	5
14. My organization has a clear developmental vision to guide the employees' actions in environment management	1	2	3	4	5
15. In my organization, there is a mutual learning climate among employees for green behavior and awareness in my company	1	2	3	4	5

16. In my firm, there are a number of formal or informal communication channels to spread green culture in our company	1	2	3	4	5
17. In my organization, employees are involved in quality improvement and problem-solving on green issues	1	2	3	4	5
18. My organization offer practices for employees to participate in environment management, such as newsletters, suggestion schemes, problem-solving groups, low-carbon champions and green action teams	1	2	3	4	5
19. My organization emphasizes a culture of environmental protection	1	2	3	4	4

Green Human Capital

1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree

Items	1	2	3	4	5
1. The managers in the company can fully support their employees to achieve goals of environmental protection	1	2	3	4	5
2. The employees' competence in environmental protection in the company is better than that of its major competitors	1	2	3	4	5
3. The cooperative degree of teamwork about environmental protection in the company is more than that of its major competitors	1	2	3	4	5
4. The production and contribution of employees about environmental protection in the company are more than that of its major competitors	1	2	3	4	5

Green Performance:

1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree

Items	1	2	3	4	5
1. My firm reduced wastes and emissions from operations	1	2	3	4	5
2. My firm reduced the environmental impacts of its products/service	1	2	3	4	5
3. My firm reduced environmental impact by establishing partnerships	1	2	3	4	5

4. My firm reduced the risk of environmental accidents, spills, and releases	1	2	3	4	5
5. My firm reduced purchases of non-renewable materials, chemicals, and components	1	2	3	4	5

Agile leadership:

1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree

Items	1	2	3	4	5
1. My Leader has a strategic vision to achieve its goals.	1	2	3	4	5
2. My leader creates a suitable working environment for employees to develop their creativity and exploration-oriented behaviors.	1	2	3	4	5
3. My leader assigns the right person to the right job at the right time.	1	2	3	4	5
4. The bonuses and bonuses my leader provides affect the behavior of the personnel positively	1	2	3	4	5
5. My leader makes employees aware of why they are doing that job.	1	2	3	4	5
6. He/she leads his/her employees with his/her actions rather than words.	1	2	3	4	5
7. My leader rewards innovative ideas and practices.	1	2	3	4	5
8. My leader motivates its employees.	1	2	3	4	5
9. The quality of opportunities such as working environment, social facilities and job security is high.	1	2	3	4	5
10. My leader attaches importance to establishing and developing cooperation between the departments of our company.	1	2	3	4	5
11. My leader includes its subordinates in the decision processes in all processes and stages from the preproduction of the product or service to the delivery to the customer.	1	2	3	4	5
12. My leader rewards team performance rather than individual performance.	1	2	3	4	5
13. My leader Emphasizes team collaboration rather than individuality.	1	2	3	4	5
14. My leader Thanks to the effective feedback culture in our company, it gives importance to developing its employees.	1	2	3	4	5
15. My leader allows employees at any management level to demonstrate their leadership on a subject.	1	2	3	4	5

16. My leader has a high ability to persuade his employees.	1	2	3	4	5
17. My leader has sufficient up-to-date technological knowledge to follow the trends in the market.	1	2	3	4	5
18. My leader reaches the personnel quickly by using new communication channels based on social media and technology.	1	2	3	4	5
19. Since my leader enables quick decision making, he/she does not gather all the authority on itself, but transfers the authority to the expert.	1	2	3	4	5
20. My leader makes flexible plans to produce different products and models.	1	2	3	4	5
21. My leader gives importance to the flexibility of producing different amounts of products and services in line with technological and environmental changes.	1	2	3	4	5
22. My leader is flexible in personnel exchange between departments or teams within the scope of human resources policies.	1	2	3	4	5
23. My leader allows the personnel to be flexible in their working hours.	1	2	3	4	5
24. My leader does not insist that employees do things they do not believe in.	1	2	3	4	5
25. My leader gives importance to deliver products and services to the customer as soon as possible.	1	2	3	4	5
26. The speed of decision making in the production processes is high.	1	2	3	4	5
27. My leader acts quickly in producing products that may be in demand in the market and presenting these products to the market.	1	2	3	4	5
28. My leader senses environmental and technological changes.	1	2	3	4	5
29. My leader has the knowledge, skills and ability to adapt new technological products and services to our company.	1	2	3	4	5
30. My leader has the hand-on experience to handle new technological products and services to our company.	1	2	3	4	5
31: My leader gives more importance to short-term goals to increase the company's profits.	1	2	3	4	5
32: My leader prepares our company in advance for environmental and technological changes.	1	2	3	4	5