

**GHRM bundle practices predict  
sustainable performance  
in Pakistan's manufacturing firms:  
A Mediation Model  
of Green Human Capital**

Muhammad Shoaib, Ph.D.

Doctoral Thesis Summary

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**GHRM bundle practices predict sustainable performance in Pakistan's manufacturing firms: A Mediation Model of Green Human Capital**

Přístupy GHRM jako prediktor udržitelné výkonnosti v pákistánských výrobních firmách: Model zprostředkování zeleného lidského kapitálu

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## **ABSTRACT**

Nowadays, every industry is focusing on sustainable growth as environmental issues such as global warming, water shortages, emissions, etc. are becoming more prominent. These issues are becoming more prevalent not just outside the organization, but also inside the organization. Organizations are investing all of their resources into implementing green initiatives to fix these issues. The thesis refers to the absence of an observational study on green human resource management (GHRM) practices in the manufacturing company and a particular circumstance in a developing country. This study investigates the link between green human resource management bundle practices and green human capital and their impact on the triple bottom lines of sustainability performance (i.e., environmental, social, and economic performance). The study focused on workers employed in the pharmaceutical, food, and textile industries, known for high levels of pollution, in Pakistan. A simple random sampling method was used to collect data through a survey questionnaire, resulting in 413 screened responses used for analysis of structural equation models. This thesis provides a new theoretical model for academics, based on data from Pakistan's manufacturing sectors, that sheds light on GHRM, green human capital, and sustainable performance. The results showed that the implementation of GHRM bundle practices has a significant effect on enhancing a firm's sustainable performance. This study is unique in its examination of the combined impact of GHRM bundle practices, green human capital, and sustainable performance in the field of environmental management. It contributes to the existing literature by exploring the relationship between green HR practices and sustainable performance in Asian countries such as Pakistan. This study suggests that a combination of GHRM practices and green human capital is necessary to establish and maintain sustainable performance. It offers guidance to policymakers in selecting effective practices to implement in the manufacturing industry and create sustainable performance programs.

To address the growing environmental issues in the manufacturing industry, this study recommends that managers implement specific GHRM practices in conjunction with a green human capital perspective to facilitate the implementation of environmental policies and achieve sustainable performance.

## **ABSTRAKT**

V dnešní době se každé odvětví soustředí na udržitelný růst, protože se stále ve větší míře objevují environmentální problémy, jako je globální oteplování, nedostatek vody, emise atd. Tyto problémy se stávají stále častějšími nejen vně, ale také uvnitř organizace. Organizace investují všechny své zdroje do zavádění ekologických

iniciativ k řešení těchto problémů. Práce poukazuje na absenci observační studie o přístupech ekologického řízení lidských zdrojů (GHRM) ve výrobní firmě v konkrétních podmínkách rozvojové země. Tato studie zkoumá souvislost mezi praktikami ekologického managementu lidských zdrojů a zeleným lidským kapitálem a jejich dopad na tři dimenze udržitelné výkonnosti (environmentální, sociální a ekonomická výkonnost). Studie se zaměřila na pracovníky zaměstnané ve farmaceutickém, potravinářském a textilním průmyslu v Pákistánu, jenž je charakteristický vysokou mírou znečištění. Ke sběru dat byla použita metoda prostého náhodného výběru prostřednictvím dotazníku, jehož výsledkem bylo 413 vybraných odpovědí použitých pro analýzu modelováním strukturálních rovnic. Tato práce poskytuje akademikům nový teoretický model založený na údajích z pákistánských výrobních odvětví, který blíže vysvětluje GHRM, zelený lidský kapitál a udržitelnou výkonnost. Výsledky ukázaly, že implementace postupů GHRM má významný vliv na zvýšení udržitelné výkonnosti firmy. Tato studie je jedinečná ve smyslu zkoumání souhrnného dopadu postupů GHRM, zeleného lidského kapitálu a udržitelné výkonnosti v oblasti řízení z hlediska ochrany životního prostředí. Přispívá k rozšíření stávající poznatků tím, že zkoumá vztah mezi zelenými praktikami v oblasti lidských zdrojů a udržitelnou výkonností v asijských zemích, jako je Pákistán. Z této studie vyplývá, že pro dosažení a zajištění udržitelné výkonnosti je nezbytná kombinace postupů GHRM a zeleného lidského kapitálu. Práce dále přináší doporučení pro tvůrce koncepce účinných postupů, které je třeba zavést ve zpracovatelském průmyslu, a při tvorbě nástrojů udržitelné výkonnosti. Pro lepší řešení narůstajících environmentálních problémů ve zpracovatelském průmyslu tato studie doporučuje, aby manažeři zavedli konkrétní postupy GHRM ve spojení s aspektem zeleného lidského kapitálu, a usnadnili tak implementaci environmentálních strategií a dosažení udržitelné výkonnosti.

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## 1.INTRODUCTION

Undoubtedly, manufacturing companies' effect on the environment increases, contributing to demands for sustainability activities that address social, economic, and environmental demands (Hussain et al., 2018; Abdullah et al., 2015; Diabat et al., 2013). It is viewed as a complex and, in some situations, the divisive task to achieve this balance (Haffar and Searcy, 2017; George et al., 2015). As the most critical contributor to emissions and environmental problems, the manufacturing sector has been described. It is essential and necessary to support the concept of sustainable performance based on this reality. Pakistan produces 0.4% of the world's overall emissions, steadily rising (Shahzad et al., 2017). It is of considerable importance to stakeholders as well. Business structures also need to be restructured to produce competitive results, to research and improve new and advanced capabilities, which are essential (Malik et al., 2020).

However, in developed and developing countries, the manufacturing industry is a source of diverse environmental pollution types that involve critical evaluation, inspection, and correction of its managerial activities (Rehman et al., 2016). Due to the multiplier effect and role of the manufacturing sector on economic development (Marconi et al., 2016; Szirmai and Verspagen, 2015), this critical sector's environmental impacts are increasingly required for environmentally sustainable practices. Adopting sustainability practices is not confined to particular departments of the organization. In reality, workers are similarly liable for keeping the environment of their company green in all functions of the organization (Opatha and Arulrajah, 2014; Jabbour et al., 2008). Thus, Managers should engage their workers in environmental protection activities at all times. Therefore, a simple guide is required to assist human resource managers in applying and improving green human resource management for environmental performance improvement. All firms are now 'obliged' to make further efforts to align their environmental, social, economic, and efficiency, especially for those who, with community, competitive and regulatory pressures (Russo and Foutus, 1997; Ayuso et al., 2014).

While the extensive literature on GHRM in developing countries is growing (O'Donohue and Torugsa, 2016; Jabbour and Jabbour, 2016; Ehnert et al., 2016; Renwick et al., 2016; Jackson and Seo, 2010; Renwick et al., 2013; Jackson et al.,

2011), there is still confusion as to what HR activities are required for the successful adoption of green human resource management in both developing and developed countries. Consequently, many manufacturing organizations are likely to fail to integrate human resource functions into their environmental management initiatives. Therefore, the most complex challenge is to examine what sort of green human resource management activities should be connected with manufacturing companies' environmental policies to promote their green corporate culture. The current study aims to empirically analyze and quantify GHRM activities on EP in manufacturing organizations.

Moreover, Renwick et al. (2013) argued that, according to a new review of numerous research findings, a group of human resource management practices (i.e., a so green human resource management bundle, including unalterable and adherent human resource management practices) increases environmental efficiency by incorporating ecological standards concepts inside the organization, according to a recent analysis of different scientific studies. In other terms, the bundle GHRM practices are considered to have a beneficial influence on greening an enterprise.

In particular, many scholars addressed the absence of empirical studies in developing countries on the manufacturing sector (Rehman et al., 2016; Zhan et al., 2016). The importance of these experiments often improves if they are conducted in a developing country's demanding climate. Consequently, we must perform this research to grasp further the implementation of GHRM activities in the manufacturing industry to see the sights the impact of these practices on the sustainable performance of manufacturing organizations.

This research illustrates three significant theoretical developments. Firstly, it refers to the absence of observational study on green human resource management (GHRM) practices in the manufacturing firm and a particular circumstance in a developing country. Providing empirical evidence of the magnitude of GHRM bundle practices in this vital manufacturing field adds value to the existing body of literature. In reality, this study is the primary type in the manufacturing sector to be carried out in Pakistan. Secondly, it examines GHRM bundles' effect on sustainable performance utilizing the green human capital mediation paradigm. It adds important data from Pakistan to existing GHRM activities and literature on sustainability performance in developing countries. Lastly, a conceptual structure was designed, offering a fair process and valuable perspectives to promote HR practices to enhance sustainable efficiency for manufacturing organizations.

## **2.LITERATURE REVIEW**

### **2.1 Green human resource management practices**



Studies on the greening of organizations increased in the 1990s (Biehler-Baudisch, 1994; Hale, 1995; Wehrmeyer, 1996). The development of environmental protection programs and the introduction of ISO14001, the world's utmost commonly applied ecological management framework, are the essential explanations for this intensification (Jabbour and Santos, 2008; Chan, 2011). Through a growing array of corporate greening research (Marcus and Fremeth, 2009), it became apparent that companies were required to promote human resource management practices to incorporate greening, such as training, performance valuation, and compensations (Govindarajulu and Daily, 2004; Daily and Huang, 2001). At that period, the utmost important study was linked to human resources management and ecological management. Wehrmeyer (1996) presented it in the book *Greening Citizens*. They have increased the necessity for HRM cooperation for green problems by works that discussed more generally the beneficial impact of human capital on corporations' success (Guest, 1997; Pauwe and Boselie, 2005; Schuler and Jackson, 2014).

GHRM contains all traditional practices of human resources (recruitment and selection, performance appraisal, training, and compensations) allied with ecological goals and "strategic dimensions for HRM" (Jabbour et al., 2011) or "new forms of work organization" (Longoni et al., 2015), such as organizational culture, teamwork, and employee involvement (Kumar and Gupta, 2013; Jabbour et al., 2014; Daily et al., 2012). The purpose of recruiting and hiring is to draw prospective candidates and hire them as a specified company (Jabbour and Santos, 2009). The recruitment and selection method attempt to find the optimal applicant for a role (Jabbour et al., 2010). Environmental training is another GHRM practice that has gained considerable interest from academics (Jabbour, 2013). More recently, (Sarkis et al. '2010) claimed that eco-friendly training is necessary to enable more sophisticated environmental management techniques to be followed by workers. The impacts of environmental empowerment and ecological training (independent variables) on employee expectations of environmental performance (dependent variable) were studied by Daily et al. (2012). In the sense of green human resource management, performance appraisal and compensation are connected to incorporating environmental concerns in employee and team performance assessment systems and rewarding workers for their contribution to environmental targets (Jabbour and Santos, 2009). Calia et al. (2009) note that appropriate assessment and incentives for workers based on the effects of environmental initiatives (e.g., emissions reduction) are crucial for organizations to become more environmentally proactive. The promotion of HR is necessary to develop environmental sustainability and create eco-innovations (Ramus, 2002). Furthermore, to these traditional human resource practices, green human resource management also works by building a greener corporate culture with the help of HRM (Jabbour and Santos, 2008; Gupta and Kumar, 2013), employee environmental empowerment (Daily et al., 2012), and

enabling environmental teams to form as alternatives to challenging environmental teams (Daily et al., 2012; Jabbour et al., 2013).

## **2.2 Green human capital**

The concept of green human capital is important because it recognizes that individuals play a crucial role in shaping the future of the planet. By investing in the development and education of people in these areas, society can create a more sustainable future. Green human capital refers to the collective knowledge, skills, abilities, experience, attitudes, wisdom, creativity, and dedication of employees in relation to environmental protection and green innovation. It is a term that emphasizes the significance of these attributes being possessed by individuals rather than being confined within organizations. The concept of green human capital has gained prominence in organizational science, as it is considered a crucial factor in the implementation of effective green human resource management practices (Chen and Chang, 2013; Yong et al., 2019).

In this regard, GHC's crucial role in achieving the goals of sustainable development through the adoption of green business practices was recognized by Yadiati et al. (2019). Individuals with green human capital can contribute to the development of new technologies, policies, and practices that promote sustainable development. They can also help educate and raise awareness among the general public about the importance of taking care of the environment. Furthermore, employees with greater exceptional skills and knowledge of green activities help increase efficiency through the reduction of waste, cost, and consumption, which ensures achieving sustainable performance. GHC regards this as a crucial strategic resource for a sustainable competitive edge in the ever-changing environment of today (Yusliza et al., 2020).

## **2.3 Sustainable performance**

In business processes, SCM, and HRM, the term sustainability has been increasingly important. Jackson and Seo (2010), for example, established the need for human resource management involvement in sustainability; Vachon and Klassen (2008), on the other hand, claimed that environmental sustainability is an obligation of the supply chain. The immediate evaluation of environmental, economic, and social performance requires an important measurement of sustainable performance (GRI, 2006). Consequently, the philosophy of sustainability, specifically the TBL, needs to be embraced to work effectively at present and in the future (Hussain et al., 2018). Therefore, the triple bottom line's sustainability efficiency elements have the same weight and produce ordinary meaning (Svensson et al., 2018). Environmental efficiency, however, refers to the organization's capacity to reduce air pollution and effluent waste, to reduce dangerous and harmful substance use, and to reduce the

number of environmental accidents (Zhu et al., 2008) and Social results, however, relates to the actual influence of green practices on the social facets of the company's image and its products from the point of view of different stakeholders, such as suppliers, employees, buyers and the public (Newman et al., 2016). Economic efficiency relates to changes in financial and marketing performance arising from introducing green practices that boost the company's status compared to the industry average (Zhu et al., 2005; Green and Inman, 2005).

## **2.4 Green human resource management practices and sustainable performance**

It is important to assume greener behavior in any human resource management activity phase, as HRM practices encourage the implementation and maintenance of an EP' scheme, thereby allowing an organization to achieve better EP' (Jabbour and Santos, 2008b). In reality, Green human resource management plays an important role in efficiently spreading and greening companies (Nejati et al., 2017). Besides the apparent environmental gains, the introduction of green policies enhances an organization's attractiveness. It contributes to the acquisition of talent, rendering GHRM a core field of business strategy (Patel, 2014). In contrast, employee recruiting, which considers green credentials or at least respect for the climate, will draw a higher degree of workers who apply because of the strong record of an organization's sustainability practice (Ramus and Steger, 2000; Linnenluecke and Griffiths, 2010). The development and promotion of an employee's environmental priorities and practices are often helpful for an organization, contributing to changes in skills and motivation, improved retention and work-related performance, and better overall economic performance (Wagner, 2015). Margaretha and Saragih. (2013) find out that companies prefer to promote environmentally environmental management practices and strive at a greener organizational culture with ultimate targets of greater efficiencies, reduced prices, and an entirely better employee interaction environment. In reality, it reported that there is proof that individual firms that engaged in social responsibility have tangible benefits in terms of customer and employee satisfaction, exceptional recruiting of workers, and innovation. These factors are likely to consolidate the social performance of an organization. Manufacturing companies that invested in social programs took an important move by strengthening green human resource management, as Rezaei-Moghaddam (2016) stated. These projects naturally concentrate on workers' health and safety in order, for example, to avoid them from being subjected to detrimental pollution and providing a leading role. It is argued that integrating green systems would increase the sustainability of manufacturing firms' results. In the case of social performance, companies must ensure that their production activities include social activities that will maximize the influence of plant actions on both internal (i.e., personnel) and

external (i.e., consumers and suppliers) populations (Pullman et al., 2009). Moreover, there is evidence to suggest that, in addition to addressing their sustainability needs, companies that have implemented GHRM policies have been shown to contribute positively to their workers' living conditions—an overall favorable business impact on the economic performance was the result of worker wellbeing (Mandip,2012; Renwick et al., 2013) also argues that employee wellness and general welfare have gained beneficial consequences by implementing GHRM practices and policies by their company. In conclusion, GHRM practices can play an important role in improving sustainable performance in manufacturing sectors.

## **2.5 Theoretical background**

### **2.5.1 AMO theory (Ability-Motivation-Opportunity)**

AMO theory addressed HRM practices that enhance a company's human resources vis-à-vis enhanced human capabilities, according to Appelbaum et al. (2000), contributing to productivity, fewer waste, improved output, and higher profits. It is easy to grasp GHRM and its related environmental effects through the AMO theory lens, which helps understand hu practices' impact on inclusive organizational performance (Boselie et al., 2005). According to Renwick et al. 2013), green human resource management contributes significantly to sustainability by improving the "ability" of green workers (A), which includes hiring, recruiting, and training the workforce. In addition, green employee motivation (M) also entails promoting the community by supporting green initiatives and creating opportunities (O) for employees to engage in the company's green initiatives. Acquired green skills are more important than natural green skills, so green training is necessary for employees to improve their performance (Subramanian et al., 2016). Furthermore, Jiang et al. (2012b) stress that three HRM practices, directly and indirectly, lead to organizational outcomes and financial outcomes by human capital and employee motivation.

### **2.5.2 RBV theory (Resource-based view)**

Barney (1991) and Wade and Hulland (2004) indicate the RBV definition that organizations own resources, enabling them to obtain sustained competitive advantage, leading to long-term performance. The Resource-based View theory highlighted the value of human capital to its performance to achieve a strategic edge over rivals (Barney,2001). The company's resources include assets, capabilities, information, knowledge, etc., that enable them to adopt efficiency-boosting strategies (Daft 1983; Barney 1991). Barney (1991) defines three sections in the range of business resources: physical capital resources, organizational capital resources, human capital resources, Etc. Wade and Hulland (2004) highlight tools for detecting and reacting to opportunities and risks, both usable and valuable assets

and skills. Specifically, assets may be tangible (e.g., hardware for information systems, network infrastructure) or intangible (e.g., software patents, relationships). On the other side, capabilities can be skills, employee qualifications, managers' managerial style, processes, etc., which are critical for effectively converting inputs into outputs. Resources may be divided into tangible (assets and equipment) and intangible (intellectual property and knowledge) dimensions, according to Sarkis et al. (2010). Regarding the competitive advantage, businesses pursue a value-creating strategy to gain the competitive advantage, which is not concurrently implemented by all existing and future rivals by the ownership of inimitable, rare, valuable, and non-substitutable capital (Barney 1991; Mahoney and Pandian 1992). The positive credibility is often used as a source of competitive edge (Barney 1991), cost advantage and distinction are used to calculate competitive advantage in hotels (through brand recognition, service quality, and innovations) (Molina-Azorin et al. 2015). Human capital is exclusively tied to and rooted in employees. Still, as they exit the capital, they will disappear from the organization (Chen and Chang, 2012). Human capital is deemed the most valuable intangible asset, contributing to greater employee satisfaction and more significant business performance (Allameh, 2018).

### **3. RESEARCH PROBLEM, RESEARCH QUESTION, AND RESEARCH OBJECTIVES**

#### **3.1 Research Problem**

This study will clarify GHRM bundle practices' roles towards external benefits with the mediation of green human capital, which have not been investigated in previous studies. As a developing country, Pakistan faces multiple climates and environmental problems, such as air pollution, land pollution, soil depletion, water shortages, natural disasters, earthquakes, and global warming. According to the Global Environment Performance Index (EPI) and The Frontier Post (The Frontier Post, 2018), Pakistan is in low air quality countries. Rising populations, carbon pollution, and deforestation are factors correlated with these concerns. According to the study of the International Monetary Fund (IMF) in the year 2018, the critical reasons for Pakistan's environmental problems are industrialization, deforestation due to the energy crisis, urbanization, the unavailability of clean water, and rise of the temperature. It also reported that factories, industries, and hospitals in lakes, rivers, and streams dispose of thousands of tons of waste every day. This is attributed to the absence of an effective waste disposal system, the lack of understanding and knowledge of the environmental aspects, the lack of environmentally committed workers, green creative initiatives, and green practices. There is a need to increase awareness about environmental concerns in all communities and businesses. The US-AEP conducted a study in 1999. Their findings suggested that, there will carry

out much of the world's manufacturing activities in Asia in the next two decades. The recent start of the China-Pakistan Economic Corridor (CPEC) initiative, where China is constructing an economic corridor from China to Gwadar Pakistan, would carry USD 63 billion to Pakistan for investment. Various schemes are included in the passage, i.e., highways, railways, commercial and industrial areas, etc. These economic prospects would pose new concerns about environmental pollution. GHRM's role in coping with such issues would be crucial in the future. Pakistan is not self-sufficient to cope with environmental challenges created by industrial production.

Scholars have viewed GHRM as a new study line with the goal of corporate environmental protection through human resource management practices (Jabbour 2013; Jabbour et al. 2015). If the green HRM practices are adopted in the manufacturing industries, then the human capital initiatives may be more effective and useful. It is because all of the resources of an organization are used by human resources. According to the Green HRM concept, the sustainable usage of resources within organizations is encouraged through HRM policies, which more broadly relates to environmental sustainability purposes (Mishra et al., 2014; Jackson and Seo 2010; Jabbour 2013; Jabbour et al. 2015).

### **3.2 Main research goal**

From the arguments above, the research aims to develop a comprehensive model for investigating the effects of GHRM bundle practices on sustainable performance with a mediation model of green human capital in the manufacturing sectors.

### **3.3 Research question**

The research questions are proposed following the study of GHRM bundle practices that predict sustainable performance in Pakistan's manufacturing industry: A Mediation model of green human capital.

**RQ1.** In what ways do green human resource management bundle affect green human capital in manufacturing firms?

**RQ2.** Does green human capital cause better sustainable performance in the manufacturing firms?

**RQ3.** Does the green human resource management bundle affect sustainable performance in manufacturing firms?

**RQ4.** Is there a relationship between green human capital, green human resource management bundle, and sustainable manufacturing performance?

### 3.4 Research Objectives

The research purpose of the study GHRM bundle practices predicts sustainable performance in Pakistan's manufacturing firms: A Mediation model of green human capital.

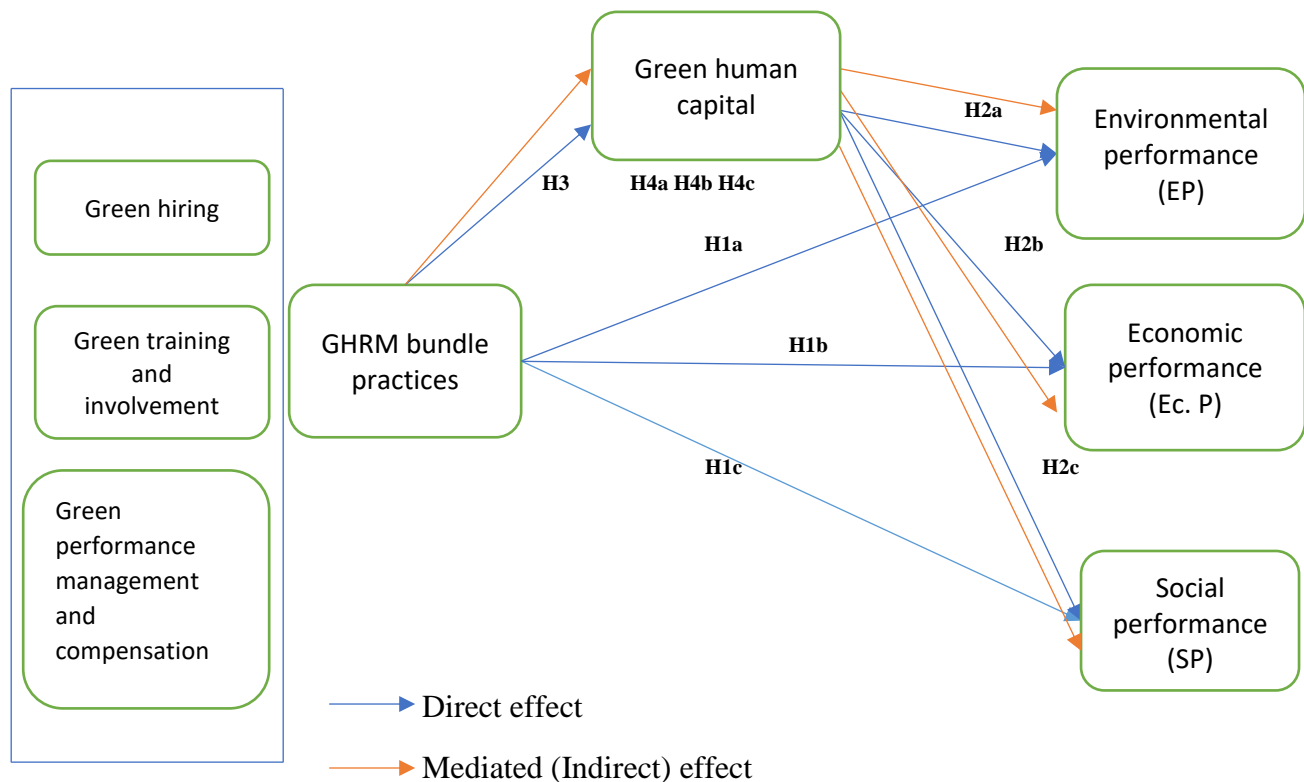
**RO1.** To understand the effect levels of green human resource management bundle on green human capital in the manufacturing firms.

**RO2.** Evaluating green human capital causes better sustainable performance in the manufacturing firms.

**RO3.** To understand the effect levels of green human resource management bundle on sustainable performance in the manufacturing firms.

**RO4.** To find out the relationship between green human capital, green human resource management bundle, and sustainable performance in the manufacturing firms.

### 3.5 Conceptual framework



In this model, GHRM bundle practices were operated as a second-order formative construct with first-order dimensions.

Figure1: research model (Source: the author)

### 3.6 HYPOTHESIS

Table 1 Summary of research Hypothesis

Hypotheses	
<b>H1a:</b>	<i>GHRM bundles positively affect environmental performance.</i>
<b>H1b:</b>	<i>GHRM bundles positively affect economic performance.</i>
<b>H1c:</b>	<i>GHRM bundles positively affect social performance.</i>
<b>H2a:</b>	<i>Green human capital positively affects environmental performance.</i>
<b>H2b:</b>	<i>Green human capital positively affects economic performance.</i>
<b>H2c:</b>	<i>Green human capital positively affects social performance.</i>
<b>H3:</b>	<i>GHRM bundles positively affect green human capital</i>
<b>H4a:</b>	<i>The Green human capital mediates the GHRM bundles practices and the environmental performance.</i>
<b>H4b:</b>	<i>The Green human capital mediates the GHRM bundles practices and the economic performance.</i>
<b>H4c:</b>	<i>The Green human capital mediates the GHRM bundles practices and the social performance.</i>

(Source: the author)



## 4. RESEARCH METHODOLOGY

Table 2 Summary of research methodology

<b>Research paradigm</b>	Positivist
<b>Research approach/ methodology</b>	Quantitative study
<b>Research strategy/ methods</b>	Survey
<b>Research techniques</b>	Questionnaire
<b>Object of analysis</b>	Manufacturing firms (Pharmaceutical, food and textile) in Pakistan.
<b>Sample size</b>	The respondents (Senior Managers and Executives, Middle Level Managers and Other Professional) working in such manufacturing firms.
<b>Data analysis</b>	Smart-PLS, SPSS Respondents' profile Measurement assessment Common method <u><b>Variance</b></u> Mean, standard deviations, and correlation Direct influences Indirect influences <u><b>Analysis</b></u> Data visualization

(Source: the author)

As mentioned above, this study's research objectives aimed to measure GHRM practices' effects on sustainable performance with the mediation effect of green human capital in the manufacturing firms in Pakistan. Thus, the quantitative method was used to achieve these objectives. This study offers the quantitative method because it can help infer the population's characteristics, attitude, or behavior from a population sample (Creswell 2003).

## **5. DATA ANALYSIS AND RESULTS**

### **5.1 Analysis of data for Causal Relationship**

In this study, two types of software are used for data analysis. Version 21 of the Statistical Package for Social Sciences (SPSS) was used for descriptive analysis. To evaluate the hypotheses, Smart Partial Least Squares (PLS) was used. The structural equation model is the best approach to take because this study is based on constructs with a large number of elements (Hair, 2007). The next section provides a thorough description of structural equation modelling (SEM) and the various SEM techniques, such as CB-SEM and PLS-SEM.

### **5.2 Construct measurement**

In this study, the internal consistency of the measuring elements, the reliability of the indicators and the convergence validity were evaluated using Smart-PLS 3.0. Cronbach's alpha and composite reliability were used to gauge internal consistency, and average variance extracted (AVE) was used to gauge convergent validity. Cronbach's Alpha values below 0.6 are considered poor, whereas those above 0.7 are considered good, according to Sekaran (2000). Composite dependability also assesses the instrument's internal consistency. Chin (1998b) asserts that while Cronbach's alpha produces a significant overestimate of internal consistency dependability and assumes that all indicators are equally weighted, composite reliability takes into consideration instruments that have various loadings. If the values are greater than 0.70, internal consistency through composite reliability is considered excellent (Chin, 1998b).

The reliability of the construction indicator was also evaluated. According to Ramayah, Cheah, Chuah, Ting, and Memon (2016), it is recommended that the validity of the indicator be greater than 0.70; consequently, loading scores of 0.60 and 0.50 are sufficient if other loading scores are used to supplement AVE and CR. The convergent validity of the constructs was also evaluated in the pilot study. According to Ramayah et al. (2016), convergent validity is assessed using a single item that reflects a construct that is convergent when compared to items measuring a distinct construct. By evaluating the average variance extracted (AVE), the convergence validity is assessed. If the AVE values are larger than 0.50, Fornell and Larcker (1981) claim that the construct's convergent validity is sufficient.

Table 3 presents the Cronbach, s Alpha (CA), Composite Reliability (CR), and Average Variance Extracted (AVE)

<b>Model Construct</b>	<b>Measurement Items</b>	<b>Loading</b>	<b>CA</b>	<b>CR</b>	<b>AVE</b>
Green Hiring	GH2	0.850	0.853	0.899	0.641
	GH3	0.729			
	GH4	0.785			
	GH5	0.805			
	GH6	0.828			
	GH7	0.828			
Green Training & Involvement	GT2	0.808	0.854	0.909	0.626
	GT3	0.783			
	GT4	0.808			
	GT5	0.757			
	GT6	0.831			
	GT7	0.756			
	GT8	0.756			
Green Performance & Compensation	GPC2	0.700	0.912	0.849	0.529
	GPC3	0.695			
	GPC5	0.777			
	GPC6	0.754			
	GPC7	0.707			
	GPC8	0.707			
Green Human Capital	GH2	0.825	0.876	0.891	0.672
	GH3	0.834			
	GH4	0.797			
	GH5	0.797			

	GH5	0.822			
Social Performance	SP1	0.767	0.845	0.845	0.646
	SP2	0.860			
	SP3	0.782			
Environmental Performance	EP1	0.838	0.899	0.874	0.635
	EP2	0.751			
	EP3	0.787			
	EP4	0.808			
	EP5	0.841			
Economic Performance	ECP1	0.744	0.867	0.839	0.567
	ECP2	0.706			
	ECP3	0.815			
	ECP4	0.743			

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*(Source: the author)*

The findings show that, with the exception of the whole construct, the measures have excellent reliability and validity. It was observed that the loading of the GTI, GHC and GPC indicator was less than 0.50, which resulted in lower values for the AVE and CR of the tangibility construct. Henseler, Ringle, and Sinkovics (2009a) contend that an indicator should only be eliminated when its reliability is poor, and doing so raises the indicator's overall composite reliability. As a result, one of the GTI, GHC, and GPC items was taken out of the survey. The findings showed that the reliability and validity of the measure were satisfactory, and sufficient to permit moving on to the actual survey.

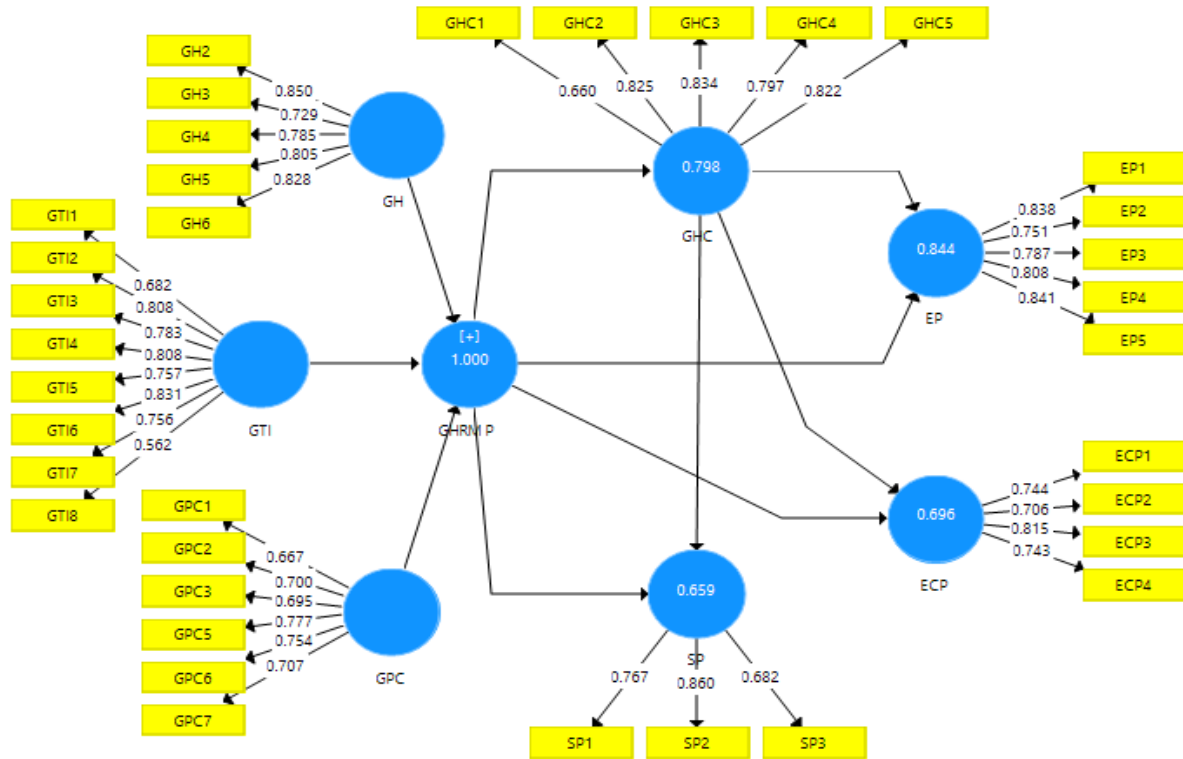


Figure.2 Path analysis model (Extracted from SmartPLS 3.0) Source: Author

This study used SmartPLS 3 analyze the measurement and structural models by the means of algorithms and bootstrapping for partial least squares regression (PLS), while blind folding technique was used to assess the quality of both models.

### 5.3 Evaluation of the reflective measurement model

The assessment of the measurement model typically involves the following criteria to be evaluated to ensure the suitability of the measurement model.

#### 5.3.1 Factor loadings

The measure is said to be reliable when its factor loadings (FL) are above 0.50 (Hair, Black, Babin & Anderson, 2019). All study scale factor loadings were above 0.5, (see Table 3), there were some items that had low factor loadings, eg, GH1, GPC4, SP4, SP5, and SP6 which were deleted from the model to improve the model fitness (Hair et al., 2019). Therefore, an overall base for the reliability of our measures was approximately established.

### 5.3.2 Internal consistency

The reliability threshold for the measure is  $> 0.7$  Cronbach's alpha (CA) scores for each measure (Hair et al., 2019), my estimations met the criteria very well for the study constructs, except SP which had CA = 0.67 (see Table 4).

### 5.3.3 Composite Reliability (CR)

However, due to the issue of underestimation associated with Cronbach's  $\alpha$ , there is a requirement for a more accurate estimation of true reliability (Garson, 2012). As presented in Table 4, my model satisfactorily achieved the desired values of CR ( $> 0.7$ ) for confirmatory purposes, as suggested by Hair et al. (2019).

### 5.3.4 Convergent Validity

For convergent validity, the AVE (average variance extracted) should be greater than 0.5 (Hair et al., 2019). The AVE values in Table 4 are well above the defined criteria to prove the convergent validity of the constructs.

### 5.3.5 Discriminant Validity

It is defined as the degree to which a particular latent construct is dissimilar with other latent variables in any given measurement model (Duarte & Raposo, 2010). I concluded discriminant validity-based HTMT  $< 0.85$  or  $< 0.90$  (Hair et al., 2019), as shown in Table 4 that all HTMT values were not as per the required criteria, so discriminant validity of the measurement model was not established.

### 5.3.6 Quality of the measurement model

The measurement model's predictive validity, which is determined by the values of communality (H<sup>2</sup>), was found to be consistently positive across all blocks (as shown in Table 4). This ensures the high quality and accuracy of the measurement model's predictions.

Table 4 Reliability, Validity, and Quality of the Measurement Model

	CA	CR	AVE	H <sup>2</sup>	HTMT			
					ECP	EP	GHC	SP
<b>ECP</b>	0.746	0.839	0.567	0.441	-			
<b>EP</b>	0.864	0.902	0.649	0.599	0.997	-		
<b>GHC</b>	0.849	0.892	0.624	0.552	0.903	0.964	-	
<b>SP</b>	0.670	0.815	0.597	0.346	1.010	0.977	0.873	-

(Source: the author)

## 5.4 Formative Measurement Model

The formative model does not require factor loadings, AVE or HTMT etc. as the indicator variables are uncorrelated, and it is assessed through the following methods.

### 5.4.1 Collinearity of Indicators

Items in a formative model are required to be noncollinear; to confirm their noncollinearity, VIF values are examined for collinearity preferred to be within 3 to 5 to ensure that there is no collinearity among the formative indicators of a construct (Hair et al., 2019). Table 5 shows that the VIF values for all indicators were less than 3, so this criterion was met to establish the reliability and validity of the formative model.

### 5.4.2 Outer Weights' Significance and Relevance of the Outer Weights

The next step in evaluating the formative measurement model was to examine the outer weights of the indicators (OW) and their significance ( $p < .05$ ). Indicators for the significant outer weights are retained and their relevance is established on the basis of their sizes, the larger the size, the more relevance. Table 5 showed that none of the OW was insignificant.

### 5.4.3 Relevance of Indicators

The final step in evaluating the formative measurement model was to evaluate the outer / factor loadings of the indicator variables (Hair et al., 2019). Outer loading  $> 0.5$  is considered relevant, as shown in Table 5 that all indicators had  $FL > 0.5$ , taken together significance and relevancy confirmed the reliability and validity of the formative measurement model.

Table 5 Reliability and Validity of the Formative Measurement Model

Item / Indicator	VIF	FL	FL - P	OW	OW - P
<b>GH2</b>	2.281	0.850	0.000	0.262	0.000
<b>GH3</b>	1.615	0.729	0.000	0.223	0.000
<b>GH4</b>	1.847	0.786	0.000	0.248	0.000
<b>GH5</b>	1.923	0.805	0.000	0.261	0.000
<b>GH6</b>	2.146	0.828	0.000	0.254	0.000
<b>GPC1</b>	1.407	0.667	0.000	0.207	0.000

<b>GPC2</b>	1.497	0.700	0.000	0.222	0.000
<b>GPC3</b>	1.444	0.695	0.000	0.227	0.000
<b>GPC5</b>	1.693	0.777	0.000	0.258	0.000
<b>GPC6</b>	1.629	0.754	0.000	0.250	0.000
<b>GPC7</b>	1.475	0.707	0.000	0.227	0.000
<b>GTI1</b>	1.596	0.682	0.000	0.150	0.000
<b>GTI2</b>	2.300	0.808	0.000	0.181	0.000
<b>GTI3</b>	2.165	0.783	0.000	0.168	0.000
<b>GTI4</b>	2.505	0.808	0.000	0.179	0.000
<b>GTI5</b>	2.138	0.757	0.000	0.165	0.000
<b>GTI6</b>	2.403	0.831	0.000	0.187	0.000
<b>GTI7</b>	1.877	0.756	0.000	0.167	0.000
<b>GTI8</b>	1.377	0.562	0.000	0.122	0.000

(Source: the author)

## 5.5 Results of Structural Model

Testing the structural model occurred after the model's validity and dependability were established. Using the route coefficient, the R2 determination coefficient, and the assessment of lateral collinearity, the validity of the structural model was evaluated. The magnitude of the effect of the route model (f2) and the relevance of the prediction (Q2) were also evaluated. The following subsections provide an overview of the tests employed to assess the validity of the structural model in this study. The results of the structural model used for this investigation are shown in Figure 3.

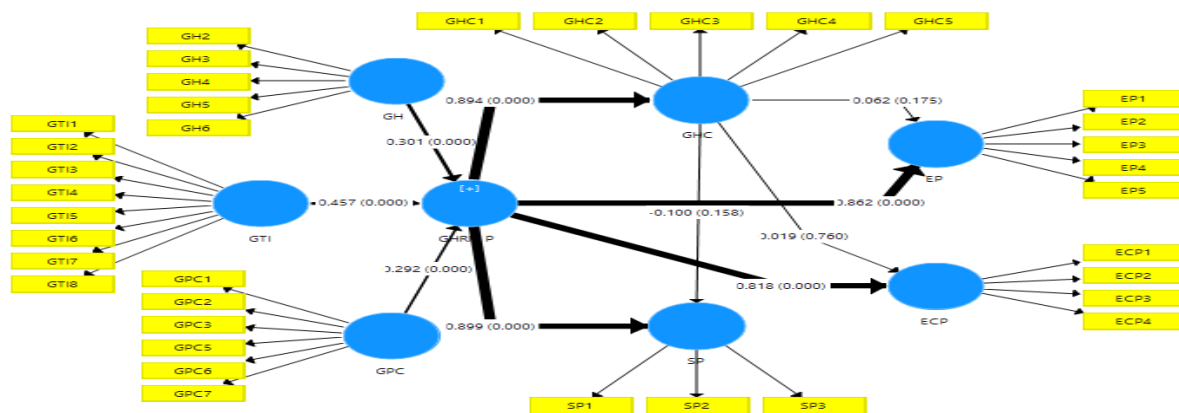




Figure 3: Structural Model (Source: the author)

A structural model presented by Hair et al. (2019) illustrates the connections between different constructs and relevant theories and literature. To examine the hypotheses on direct effects, SmartPLS 3 was utilized, employing algorithms, bootstrapping, and blindfolding techniques for testing purposes.

## 5.6 Hypothesis Testing Results

Non-parametric partial least squares analysis does not require normality of data. Therefore, there is a possibility that the t-values will be inflated or deflated, resulting in a type 1 error. Therefore, the bootstrapping method is advised (Wong, 2013). In the bootstrapping technique, a sizable subset (5000) of the original sample is taken with replacement to calculate the bootstrap standard errors, which in turn provides approximative t values for the structural path's significance testing (Wong, 2013). Other numbers for bootstrapping are also suggested in the literature, such as 1000, according to Chin (1998b).

### 5.6.1 Direct and Indirect Relationship Analysis

The researcher needs to assess the path coefficients, which assist in determining the strength of correlation between two latent variables. In line with the recommendations of Ramayah et al. (2016), Table 6 provides the critical values for significance in both the two-tailed test and the one-tailed test.

Table 6 Hypothesis Testing Results

Path	B	SE	T	P	F <sup>2</sup>	Status
<b>GHRM P → EP</b>	.862	.045	19.358	.000	.955	H1a: Supported
<b>GHRM P → ECP</b>	.818	.056	14.549	.000	0.436	H1b: Supported
<b>GHRM P → SP</b>	.899	.066	13.641	.000	0.474	H1c: Supported
<b>GHC → EP</b>	.062	.046	1.360	.175	0.005	H2a: Not supported.
<b>GHC → ECP</b>	.019	.061	0.305	.760	0.000	H2b: Not Supported
<b>GHC → SP</b>	-.100	.071	1.412	.158	0.005	H2c: Not Supported
<b>GHRM P → GHC</b>	.894	.014	63.597	.000	3.962	H3: Supported

<b>GHRM P → GHC → EP</b>	.056	.041	1.356	.176	-	H4a: Not Supported
<b>GHRM P → GHC → ECP</b>	.017	.055	0.305	.761	-	H4b: Not Supported
<b>GHRM P → GHC → SP</b>	-.089	.064	1.398	.163	-	H4c: Not Supported

(Source: the author)

**Hypothesis Testing:** I employed bias-corrected 95% confidence intervals to examine direct effect hypothesis, see Table 6 and Figure 2 for details.

The proposed hypothesis (H1a, H1b, H1c, H2a, H2b, H2c and H3) were examined and presented in Table 6. All hypothesis was accepted except H2a, H2b, H2c. GHRM bundle practices have a significant positive relationship with environmental performance, economic performance and social performance as well. GHRM bundle--> EP ( $\beta = .862, t = 19.358, p < .001$ ) with a large effect size ( $F2 = .955$ ; Cohen, 1988), GHRM bundle-->Ec. P,  $\beta = .818, t = 15.549, p < .001$ ) with a large effect size ( $F2 = .436$ ), GHRM bundle-->SP= $(\beta = .899, t = 13.641, p < .001)$  with a large effect size ( $F2 = .474$ ). However, the effect of Green human capital on sustainable performance is not statistically significant, so H2a, H2b, H2c are not supported, and GHRM bundle--> GHC ( $\beta = .894, t = 63.597, p < .001$ ) with a large effect size ( $F2 = 3.962$ ) are statistically significant with GHC. The GHC has not significant relationship with environmental performance, economic performance and social performance,  $GHC-->EP = (\beta = .062, t = 1.360, p = .175)$  with an indistinguishable effect size ( $F2 = .005$ ),  $GHC--> Ec. P (\beta = .019, t = .305, p = .760)$  without effect size ( $F2 = .000$ ),  $GHC--> SP = (\beta = -.100, t = 1.412, p = .158)$  with an insignificant effect size ( $F2 = .005$ ).

Mediation test. The direct effect of GRHM and sustainable performance is significant, while the indirect effect is not significant. Thus, H4a, H4b, H4c are not supported. GHRM bundle practices has not significantly impact on environmental performance, economic performance and social performance as seen by in table, GHRM bundle-->GHC -->EP ( $\beta = .056, t = 1.356, p = .1761$ ), GHRM bundle-->GHC --> Ec. P ( $\beta = .017, t = .305, p = 0.661$ ), GHRM bundle-->GHC -->SP ( $\beta = -.089, t = 1.398, p = .163$ ), with the mediated role of green human capital (GHC).

## 5. 7 Quality of the structural model

The predictive relevance of the structural model was measured using Stone-Geisser Q2, R2 and VIF. Q2 is used to measure the eminent quality of the structural model. The positive values of Q2 (> 0) are acceptable for the good quality of a structural model. R2 is the measure of the overall effect size, as indicated in Table 7 that 84.3% of EP, 69.5% of ECP, 65.7% of SP, and 79.8% of GHC were explained by the

relevant prediction model. Furthermore, this model was also free from suspects of path contamination and collinearity, since the VIF values were  $< 5$  (Hair et al., 2019), suggesting good quality of the model.

Table 7 Quality Measures of the Structural Model

<b>Outcome Variable</b>	<b>Q<sup>2</sup></b>	<b>Adjusted R<sup>2</sup></b>	<b>VIF</b>
EP	0.543	0.843	4.962
ECP	0.386	0.695	4.962
SP	0.374	0.657	4.962
GHC	0.491	0.798	1.000

*(Source: the author)*

## 6. DISCUSSION

This study examined the influence of Green Human Resource Management (GHRM) practices on sustainable performance in Pakistan's manufacturing industries, while also considering the mediating role of green human capital. The findings of the study support some proposed hypotheses and some are unsupported. The first hypothesis suggested that GHRM practices have a positive impact on sustainable performance. The results confirmed that GHRM practices significantly contribute to sustainable performance, which is consistent with previous research (Pham et al., 2019; Aboramadan, 2020; Ari et al., 2020; Shoaib et al., 2022). Therefore, the first hypothesis is supported, indicating that organizations need to integrate green practices into their HRM policies to achieve sustainable performance.

To promote sustainable performance, organizations should focus on adopting green-oriented approaches in recruitment and selection processes, as well as implementing green training programs to enhance employee skills. Additionally, it is important to encourage and empower employees to engage in green practices by incorporating these behaviors into performance evaluations and rewards. The implementation of green HRM practices in organizations leads to improved environmental, economic, and social performance, all of which contribute to the achievement of sustainable performance. Approaches such as green staffing, green training programs, green performance management systems, and the development of green human capital are instrumental in fostering environmentally and socially responsible practices, ultimately improving economic performance.

The second hypothesis investigated the correlation between green human capital and sustainable performance. However, the outcomes indicated that the influence of green human capital on sustainable performance did not exhibit statistical significance. In particular, there was no direct effect of green human capital on financial, economic, and social performance. Nevertheless, these findings align with prior research conducted by Kim & Stepchenkova (2018), Jian et al. (2020), and Su et al. (2020). The inconsistency in the findings could be attributed to the increased emphasis placed by organizations on environmental-friendly actions and the level of readiness among employees. It is important to acknowledge that the absence of idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration within companies in developing nations could have played a role in shaping these findings. However, the presence of green human capital still plays a role in promoting pro-environmental behaviors among employees for sustainable performance.

The results of the mediation hypothesis indicate that there is no statistical evidence to support the idea that green human capital acts as a mediator between GHRM practices and sustainability. Both direct and indirect effects between these factors are not significant, as reported by Jabbour & Jabbour (2015), Khan & Muktar (2020), and Jabbour & Renwick (2020).

However, it has been found that, despite the lack of a significant indirect effect of green human capital on sustainable performance, the presence of green human capital still plays a crucial role in fostering pro-environmental behaviors among employees, thereby contributing to sustainable performance.

Civil society plays a crucial role in environmental governance and performance, particularly in the effective implementation of environmental policies. Nongovernmental organizations (NGOs) are active members of civil society, advocating for ecological concerns and playing a vital role in promoting sustainable environmental governance (Karlsson-Vinkhuyzen, Friberg, & Saccenti, 2017). Numerous non-governmental organizations (NGOs), community stakeholder organizations, and civil society groups are actively involved in promoting awareness regarding specific policies and causes pertaining to environmental sustainability. Furthermore, activists actively participate in debates and campaigns focused on pressing ecological concerns, aiming for substantial changes in social and environmental policies. Their efforts possess the capacity to prioritize sustainability issues on a national scale and prompt revisions to current environmental regulations that foster sustainability (Torney, 2019).

## **6.1 Comparative analysis with previous studies**

The analysis of relevant research on green HRM policies and practices suggests that companies can enhance their sustainability by improving their understanding and

broadening the scope of such initiatives. Although it is a recent development, organizations must recognize the importance of green HRM to better coordinate their environmental and social objectives with responsible human resource practices (Adel Ali Yassin Alzyoud, 2021). Adopting a green approach to HR management strengthens the influence of corporate social responsibility on long-term success. This is because the GHRM approach helps organizations fulfil their social obligations to society by promoting performance outcomes that align with their social responsibility goals, such as reducing waste, increasing efficiency, and providing high-quality services. By working to protect the environment from damage or degradation, the green approach also improves the organization's financial and environmental performance (Ola Hmeedat & Rokaya Albdareen, 2022).

This study found some outcomes that align with previous research and others that diverge. Specifically, the finding of a significant impact of the GHRM bundle practices on sustainable performance aligns with previous studies of (Mousa & Othman, 2019; Almemari et al., 2021; José-Moleiro Martins et al., 2021., Shoaib et al., 2022). Mousa and Othman (2019) This study examined the impact of three human resource management practices, namely green hiring, green training and participation, and green performance management, on economic performance, social performance, and environmental performance. The results showed that the combination of these practices had a significant positive effect on all three aspects of performance. The study by Almemari et al. (2021) also found evidence of the positive impact of GHRM practices on economic, social and environmental performance. Ababneh (2021) examined the impact of GHRM on sustainable performance. The results showed that by effectively implementing practices such as environmental-focused talent acquisition, training and development, evaluation, and compensation, organizations can achieve sustainable performance as it promotes a green culture and develops the skills of employees in all areas of operation (Wei & Huang, 2022). However, unlike previous research, it looked at three aspects of GHRM and evaluated its combined impact on green human capital and sustainable performance. Regarding the unexpected findings, the mediating role of green human capital was not supported. Maintaining this factor alone is not enough to mediate the effects of GHRM on sustainable performance. Jain and Dlima (2018) and Shoaib et al (2021) analyzed the relationship between GHRM practices and green human capital within an organization, demonstrating that it is feasible to drive the organization towards sustainable development through environmental awareness and the determination to maximize profits while maintaining environmental quality (Gopinath et al., 2021). The findings of this study showed that the effect of GHRM practices on sustainable performance was not mediated by the connection between green human capital and sustainable performance. In summary, the presence of

green human capital still plays a role in promoting the fact that combining GHRM practices with green human capital leads to improved sustainable performance.

## **6.2 Theoretical contribution**

This thesis presents theoretical and practical findings and contributes to the field of organizational sustainability by examining the relationship between GHRM practices, green human capital, and sustainable performance. It is an important addition to the existing literature on this topic.

This study provides new insights into the role of environmental management in human resource management, specifically in relation to green human capital and sustainable performance. Previous research has examined the impact of GHRM practices and green human capital separately on sustainable performance, but this study is unique in that it examines the combined effect of these factors on sustainable performance. This research fills a literature gap by exploring the simultaneous impact of GHRM and green human capital in promoting sustainable performance among employees. To be more specific, the GHRM paradigm gives full practices (including green hiring, green training and participation, green performance management, and compensation) that influence sustainable organizational performance. This research makes a valuable contribution to the limited body of literature on sustainable performance in the manufacturing sector of developing countries, specifically in the case of Pakistan (Shoib et al., 2021, 2022). Previous research has shown that GHRM orientation has a significant impact on sustainable performance (Mousa & Othman, 2019). However, this relationship needs to be further examined in the context of emerging Asian countries to ensure that the findings can be generalized to other regions (Zaid et al., 2018). It is important to consider generalizability and cultural differences when examining similar models in other countries, as results may vary. As more organizations adopt a GHRM approach, understanding these techniques could have a significant impact on both the practical and academic aspects of human resource management. Therefore, it is essential to study similar models in both emerging and developed countries. Moreover, based on resource-based view (RBV) (Barney 1991) theoretical frameworks, this study clarifies GHRM bundle practices' roles towards external benefits with the mediation of green human capital, which have not been investigated in previous studies as per my best knowledge. Following RBV theory (Barney 1991), this study identifies the mediating role of green human capital toward influences of green human resource management practices on sustainable performance. Regarding empirical contributions, this study provides new research related to the GHRM perspective in manufacturing firms and a developing country such as Pakistan to fill the empirical gaps mentioned above.

### **6.3 Practical contribution**

This doctoral thesis presents practical findings that offer compelling evidence for organizations, particularly manufacturing firms, to adopt environmentally friendly practices within their human resource management (HRM) processes. These practices, including green hiring, green training and participation, green performance management, and green compensation, have the potential to significantly contribute to the sustainable performance of manufacturing firms across environmental, economic, and social dimensions. Primarily, this study highlights the importance of incorporating sustainable practices into human resource management for manufacturing organizations. These organizations have been found to have a significant impact on the environment, through resource depletion and emissions from waste and processing methods. The study's findings indicate that in order to promote environmental conservation and achieve sustainable objectives, manufacturing organizations should consider restructuring their leadership and human resource activities (Choong et al., 2020). By providing training on environmental responsibility and offering incentives for environmentally friendly behavior, organizations can improve their overall performance and contribute to environmental conservation (Mousa & Othman, 2019). Additionally, forming green teams and implementing sustainable strategies can also help address and solve environmental issues within the workplace. (Jia et al., 2018). Incentivizing employees through opportunities for career advancement, green performance evaluations, and rewards for eco-friendly behavior can encourage creativity and environmentally conscious actions. Additionally, managers can establish teams focused on implementing sustainable strategies and addressing environmental issues within the workplace. Additionally, this study will have important implications in promoting green human resource practices, such as green human capital, which can help companies gain a competitive advantage and improve their organizational and environmental performance. To achieve sustainable performance, manufacturing organizations should hire a workforce that is dedicated to meeting economic, social, and environmental goals. To support this, HR managers should introduce green practices to employees. This study carried out in the Pakistan manufacturing sector has revealed that an integrated model of green human resource management and green human capital can lead to sustainable performance. Although cultural factors may affect results, the importance of these practices and their impact on sustainable performance cannot be denied in any organization or location. Finally, the study provides a basis for further research on the relationship between GHRM practices and sustainable performance in the manufacturing sector, which can contribute to the advancement of knowledge in this field. In general, the results of this study can contribute to the development of more sustainable and environmentally friendly business practices in the manufacturing sector in Pakistan and beyond. The model

can be applied in different sectors and countries. The statistical results, theoretical insights, and practical suggestions provided in the study support the implementation of this model in various geographical regions. The model is beneficial and can be adapted to different regions.

#### **6.4 Limitations and avenues for future research**

The current study has some limitations that should be considered in future research. One limitation is that the study focused only on the manufacturing sector, and future studies should investigate the impact of green HR practices on sustainable performance in other sectors such as agriculture and services. The study only focused on a limited number of GHRM practices and did not examine the interaction effects of different GHRM practices. Furthermore, the study relied on quantitative data collection methods and future research could benefit from a mixed-method approach for a more comprehensive understanding of the subject. Another avenue for future research would be to explore the impact of green human capital on other important outcomes, such as employee turnover, innovation, and stakeholder engagement. It would also be valuable to examine the impact of customer awareness on sustainable performance. Finally, it would be beneficial to replicate the study in different settings and industries to increase the generalizability of the findings. Overall, the results of this study highlight the need for further research on the relationship between GHRM practices and sustainable performance in the manufacturing sector.

### **7. CONCLUSION**

In conclusion, the study finds that Green HRM bundle practices can positively predict sustainable performance in Pakistan's manufacturing firms through the mediation of Green Human Capital. This highlights the importance of incorporating environmentally sustainable principles into HR policies and practices, as it can not only benefit the environment, but also lead to improved financial performance and improved reputation among stakeholders. It is recommended that manufacturing firms in Pakistan adopt a comprehensive approach to green HRM, including training and development programs, green recruitment and retention practices, and sustainable compensation and benefits schemes, to fully leverage the potential benefits of green human capital for sustainable performance.

The implementation of green HR practices, such as analysing and designing job roles with environmental considerations, recruiting environmentally conscious staff, providing training and incentives for sustainable performance, and fostering a culture of environmental stewardship through green teams and green human capital, can lead to improved sustainable performance in the manufacturing industry. This



study, conducted in Pakistan, found that these practices have a statistically significant impact on the sustainable performance of employees. By actively promoting environmentally conscious behaviour through recruitment, training, and rewards, organizations can encourage their employees to contribute to sustainable performance. The implementation of green HR practices can have a positive impact on both the environment and the bottom line of the company, by reducing costs associated with waste and energy consumption and by attracting and retaining environmentally conscious employees. Furthermore, the combination of these Green HR bundle practices influences the development of green human capital, leading to improved social, economic, and environmental performance. The results of this study highlight the importance of considering the role of green human capital in promoting sustainability in the manufacturing sector and suggest that Pakistani companies should prioritize the integration of GHRM practices in their operations.

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## **List OF PUBLICATIONS BY AUTHOR**

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**Shoib, M.**, Nawal, A., Zámečník, R., Korsakiene, R., & Asad, R. (2022). Modeling GHRM, Green human capital, and environmental performance; Moderating role of Pro-environmental attitude. The 12<sup>th</sup> conference of contemporary



Issues in Business, Management and Economics Engineering" hosted by Vilnius Tech University, Lithuania. DOI: **10.3846/bm.2022.781**

Asad, R., **Shoib, M.**, Zámečník, R., Nawal, A., & Korsakiene, R., (2022). Integrated adoption of management systems: A dual sword. International management conference hosted by Faculty of Management, Academy of Economic Studies, Bucharest, Romania. DOI: **10.24818/IMC/2021/01.04**

**Shoib, M.**, Zámečník, R., Abbas, Z., Javed, M., & Asad, R. (2021). Green human resource management and green human capital: A systematic literature review. the conference of contemporary Issues in Business, Management and Economics Engineering" hosted by Vilnius Tech University, Lithuania. DOI: **10.3846/cibmee.2021.649**

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**Shoib, M.**, Zámečník, R., Abbas, Z., & Kalsoom, G., (2021). Managing responsibly: Green human resource management leads to corporate social responsibility. International Bata Conference for Ph.D. Students and Young Researchers, Tomas Bata University in Zlín, Czech Republic. DOI: **10.7441/dokbat.2021.43**

Abbas, Z., Zámečník, R., Kalsoom, G., **Shoib, M.**, Hussain, M., & Javed, M. (2021). How green human resource management drives corporate social responsibility: A literature review. International Bata Conference for Ph.D. Students and Young Researchers, Tomas Bata University in Zlín, Czech Republic. DOI: **10.7441/dokbat.2021.43**

Abbas, Z., **Shoib, M.**, Zlamalova, J., & Zámečník, R. (2020). Green Human Resource Management as a way to Support Sustainability: A Literature Review, International Bata Conference for Ph.D. Students and Young Researchers, Tomas Bata University in Zlín, Czech Republic. DOI: **10.7441/dokbat.2020.01**

Abbas, Z., Zámečník, R., Javed, M., Gulzar, S., Hussain, K., **Shoib, M.**, & Yousaf, M., (2020). A systematic quantitative literature review of GHRM under AMO theoretical perspective. 14th International Scientific Conference INPROFORUM Business Cycles more than Economic Phenomena, University of South Bohemia in České Budějovice, Czech Republic.

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Journal of Environmental Planning and Management  
Cogent Business & Management

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**GHRM bundle practices predict sustainable performance in  
Pakistan's manufacturing firms: A Mediation Model of Green  
Human Capital**

Přístupy GHRM jako prediktor udržitelné výkonnosti v pákistánských výrobních  
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