Tomas Bata University in Zlín
Faculty of Management and Economics

Doctoral Thesis

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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LIST OF SYMBOLS, ACRONYMS, AND ABBREVIATIONS

GHRM: Green Human Resource Management

GHC: Green Human Capital

GH: Green Hiring

GTI: Green Training and Involvement

GPC: Green Performance Management and Compensation

SMEs: Small-to-medium enterprises

SMEDA: Small and Medium Enterprises Development Authority

SEM: Structural Equation Modelling

SPSS: Statistical Package for Social Sciences

VB-SEM: Variance-Based Structural Equation Modeling

CB-SEM: Covariance-Based Structural Equation Modelling

PLS: Partial least squares

CMV: Common-method variance

CA: Cronbach, s Alpha

CA: Composite Reliability

AVE: Average Variance Extracted

1. INTRODUCTION

1.1 Motivation and need for the study

Green human resource management (GHRM) bundle practices have emerged as a crucial factor in promoting sustainable performance in organizations. GHRM bundle practices refer to the set of activities and initiatives aimed at incorporating environmental and social sustainability into human resource management practices. These practices can range from incorporating sustainability into employee training, recruitment and selection, compensation, performance management, and organizational culture (Bock, A.J. et al., 2015, Ari et al., 2020). Pakistan's manufacturing sector has seen significant growth in recent years, but the industry is facing a number of challenges, including environmental degradation, energy insecurity, and low levels of sustainability awareness among employees. As a result, there is a growing need for organizations to adopt GHRM bundle practices to ensure that the industry remains sustainable and competitive in the long run (Kuijer et al., 2017, Labella-Fernandez & Martnez-del Ro, 2019).

The motivation for this study arises from the need to understand the impact of GHRM bundle practices on sustainable performance in Pakistan's manufacturing firms. Pakistan is a developing country with a significant manufacturing sector. The manufacturing industry contributes significantly to the country's GDP and employment, making it an important sector for sustainable economic growth. Pakistan faces various environmental challenges, such as pollution, resource depletion, and climate change. These challenges have a direct impact on the manufacturing industry, and studying the role of green human capital in addressing these challenges can be valuable. The study aims to examine the mediating role of green human capital in the relationship between GHRM bundle practices and sustainable performance, driven by the growing concern for sustainability in the business world and the need for organizations to adopt environmentally friendly practices (Chen, & Wang, 2015). Pakistan has been implementing environmental regulations and policies to promote sustainable practices in different sectors, including manufacturing. Understanding the effects of green human capital on sustainable performance can provide insights into the effectiveness of existing policies and help in designing more targeted interventions. The study is based on the resource-based view (RBV) and the amenability-motivation-opportunity (AMO) theory, which suggest that a firm's resources, including human capital, play a critical

role in determining its performance. One aspect of human capital that has been identified as important in sustainable performance is Green Human Capital (GHC). This refers to the knowledge, skills, and attitudes of employees that are focused on environmental sustainability. Human capital, including knowledge, skills, and abilities, plays a crucial role in driving sustainable performance. Examining the role of green human capital in Pakistan's manufacturing firms can shed light on the specific competencies required for sustainable development in this context. According to the Ability-Motivation-Opportunity (AMO) theory, individuals are more likely to engage in pro-environmental behaviors if they have the ability, motivation, and opportunity to do so. This suggests that companies that invest in the development of their employees' GHC are likely to achieve better sustainable performance. These theories suggest that a firm's resources and capabilities, such as human capital, can be leveraged to achieve competitive advantage and sustainable performance. Previous research has shown that GHRM bundle practices have a positive impact on organizational performance (Jamali et al., 2010). Despite the increasing emphasis on sustainable development, research specifically focusing on the mediation model of green human capital and its impact on sustainable performance in manufacturing firms is relatively limited, particularly in the context of developing countries. Conducting research in Pakistan can help fill this gap and contribute to the existing body of knowledge. Limited research has been conducted to examine the connection between these practices and sustainable performance specifically within the manufacturing firms of Pakistan. This study aims to address this gap by presenting empirical evidence on the relationship between GHRM (Green Human Resource Management) bundle practices and sustainable performance, while also exploring the mediating role of green human capital. The existing literature emphasizes the significance of GHRM practices in fostering sustainability within organizations. These practices encompass activities such as green training and development, green recruitment, and green performance management, which collectively contribute to building an environmentally conscious workforce that is dedicated to sustainability (Wang & Chen, 2016; Saeed et al., 2018). While the impact of GHRM on sustainable performance has been investigated in various countries, there is a dearth of research specifically examining this subject in the context of Pakistan.

The study was based on a sample of manufacturing firms in Pakistan and uses a structured questionnaire to collect data from Senior Managers and Executives, Middle Level Managers and Other Professional. Data were analyzed using structural equation modeling techniques to test the proposed mediation model. This study is significant as it provides evidence-based insights into the impact of GHRM bundle practices on sustainable performance in Pakistan's manufacturing firms. The findings of the study inform industry organizations about the importance of incorporating GHRM bundle practices into their HRM strategies, as well as the role of green human capital in promoting sustainable performance. Understanding the factors that drive sustainable performance and the role of green human capital can inform the development of strategies and practices that enhance sustainability in the industry. Furthermore, the study informs policy makers in the country about the need to encourage organizations to adopt GHRM bundle practices to promote sustainable economic growth and development in the country.

1.2 From a traditional HRM approach to a sustainable HRM model - shifting the purpose

The Hard HRM and Soft HRM models have had a significant impact on HRM debate since the 1980s (Fombrun, Tichy, & Devanna, 1984). (Beer, Spector, Lawrence, Mills, & Walton, 1984). The Michigan Hard HRM model places a strong emphasis on strategic control and gauges HRM effectiveness in terms of the firm's financial success (Huselid, 1995). This one-dimensional objective, which is viewed as the only goal of the business, emphasizes the necessity to use "best practices" in recruitment, evaluation, rewards, and human resource development in order to generate shareholder value (Fombrun et al., 1984). Concerns from larger societal or environmental stakeholders are not considered.

In the literature by Legge (1995) on context-based HRM, the distinction between Hard and Soft HRM is examined by highlighting the social, cultural, and legal objectives of HRM and its multiple roles in helping employees fulfill the expectations of various stakeholders within and outside the organization. These stakeholders include supervisors, peers, subordinates, customers, clients, family, and society as a whole (Jackson & Schuler, 1995). Context-based approaches propose an integrated framework that promotes value mutuality, effectively bridging the gaps between strategic and human considerations, economic rationality and relational rationality, as well as efficiency and fairness. The overarching objective is to attain

desired outcomes in human resources, including performance, fairness, and social legitimacy, without prioritizing one aspect at the expense of the other, whether it is strategic imperatives or human requirements.

The Hard HRM (Human Resource Management) model, also known as the "best fit" or "universalistic" model, emphasizes the importance of a strict, centralized system of rules and procedures for managing employees. It is based on the idea that there is one best way to manage people and that this can be discovered through scientific research and applied universally to all organizations. The Hard HRM model is associated with the work of authors such as Michael Beer and Richard Walton.

The soft HRM (Human Resource Management) model, also known as the "best practices" or "contextual" model, emphasizes the importance of flexibility and adaptability in managing employees. It is based on the idea that different organizations have different needs and cultures and that management practices should be tailored to fit the specific context of each organization. The Soft HRM model is associated with the work of authors such as David Guest and John Purcell.

The concept of Sustainable HRM emerged almost 20 years ago and has since generated a substantial body of literature. Several studies have examined this topic, including recent reviews by De Stefano, Bagdadli and Camuffo (2018) and Podgorodnichenko, Edgar and McAndrew (2019). To categorize this research, the four dimensions of Sustainable HRM framework is commonly used. Dyllick and Muff (2016) introduced a corporate sustainability typology that considers the organizational perspective as the first dimension (refer to Table 1). They distinguished between an "outside-in" approach, which focuses on addressing social sustainability challenges, and an "inside-out" perspective, which emphasizes the business itself (Dyllick & Muff, 2016: 168).

The inside-out perspective of Sustainable HRM involves initiatives aimed at improving organizational identification and individual task performance, with the goal of reducing business risks and enhancing shareholder value (Shen & Benson, 2016). In contrast, the outside-in approach focuses on the organization's contribution to resolving sustainability concerns and serving the common good (Dyllick & Muff, 2016: 166). "How can businesses leverage their resources, capabilities, and past experiences to effectively tackle significant societal challenges such as climate change, migration, corruption, water scarcity, poverty, pandemics, youth

unemployment, sovereign debt burdens, or financial instability?" is the question actors from an outside-in perspective pose. (Muff & Dylick, 2016: 165)

A classification of Sustainable HRM Types (Source: Dimensions adapted and extended from Dyllick & Muff, 2016).

SUSTAINABLE HRM TYPES	ORGANIZATIONAL PERSPECTIVE (PURPOSE)	SUSTAINABLE HRM INPUTS (WHAT KEY CONCERNS?)	SUSTAINABLE HRM PROCESSES (HOW?)	SUSTAINABLE HRM OUTPUTS (WHAT VALUES, RESOURCES ARE CREATED?)
Type 1 Socially Responsible HRM	Inside-out, i.e. economic and social purpose (the latter as long as it serves the economic purpose)	Creating an awareness of the impact of business on people beyond organizational boundaries and present time frames	Socially responsible HR behavior, practices, strategies, and culture, e.g., health and well-being initiatives	Economic and social values, e.g., enhanced organizational social reputation, employer attractiveness
Type 2 Green HRM	Inside-out, i.e. economic and environmental purpose (the latter as long as it serves the economic purpose)	Using HRM to embed Green values across an organization; implementing Green workplace practices	Green HR behavior, practices, strategies, and culture, e.g. Green recruitment, Green awareness training, Green rewards	Economic and ecological values, e.g., growing employee engagement with reduced carbon footprint
Type 3 Triple Bottom Line HRM	Inside-out, i.e. economic, environmental and social purpose (the latter two as long as they serve the economic purpose)	Uses HRM competencies, skIIs, knowledge, attitudes, to create win-win-win situations	Behavior, practices, strategies, cultures etc., enabling contributions to CS and to perform HRM sustainably	Triple Bottom Line, Quadruple Bottom Line, e.g., Cross-generational (green) management, secures the transfer of knowledge and skills to future generation (economic sustainability) and enhances older workers self-esteem and well-being (social sustainability)
Type 4 Common Good HRM	Outside-in	Uses HRM competencies, skIIs, knowledge, and attitudes to contribute to the common good and to help in solving "grand challenges"	HR practices and behavior enhancing common good values, e.g., trustful employment relationships	Social and Ecological Sustainable Development Impact, e.g., Decent working conditions in supply chains, employment creation, economic democracy

Figure 1: A Classification of Sustainable HRM Types (Source: the author)

The second dimension of our typology (see figure 1) focuses on the inputs of each type of Sustainable HRM. We refer to Sustainable HRM inputs as Sustainable HRM competencies, which are skills, knowledge, and attitudes. Examples include I increasing awareness of HRM's responsibility for the consequences of decisions, (ii) balancing short- and long-term goals, and (iii) supporting regenerative organizational and HRM practices.

Our third feature of sustainable HRM types focuses on how HRM creates sustainable HRM processes to restructure company practices to fit the new perspective and goals (see Figure 1). This is achieved, for instance, I by managing the opportunities and risks associated with not being sustainable or (ii) by integrating sustainability into organizational and HRM activities (also see Dyllick & Muff, 2016). Finally, our fourth component looks at Sustainable HRM outputs, which are the values or

resources produced by HRM, such as the realization of ecological, social and human values, as characterized in an analogy by Dyllick and Muff (2016). According to our classification, there are four different types of sustainable human resource management: common good, triple bottom line, green, and socially responsible. All of these have now been introduced one by one (see figure 1). Trends are changing now. The vote and guarantee of corporate progress by other companies and by its own shareholders is not as much required as in the past for any firm. All the output increased profits etc. must not be at the violation of ecological footprints necessary for environmentally friendly and green management. This new motto or slogan of green management is just a couple of demands old begging in 1990's and become popular in 2000, s.

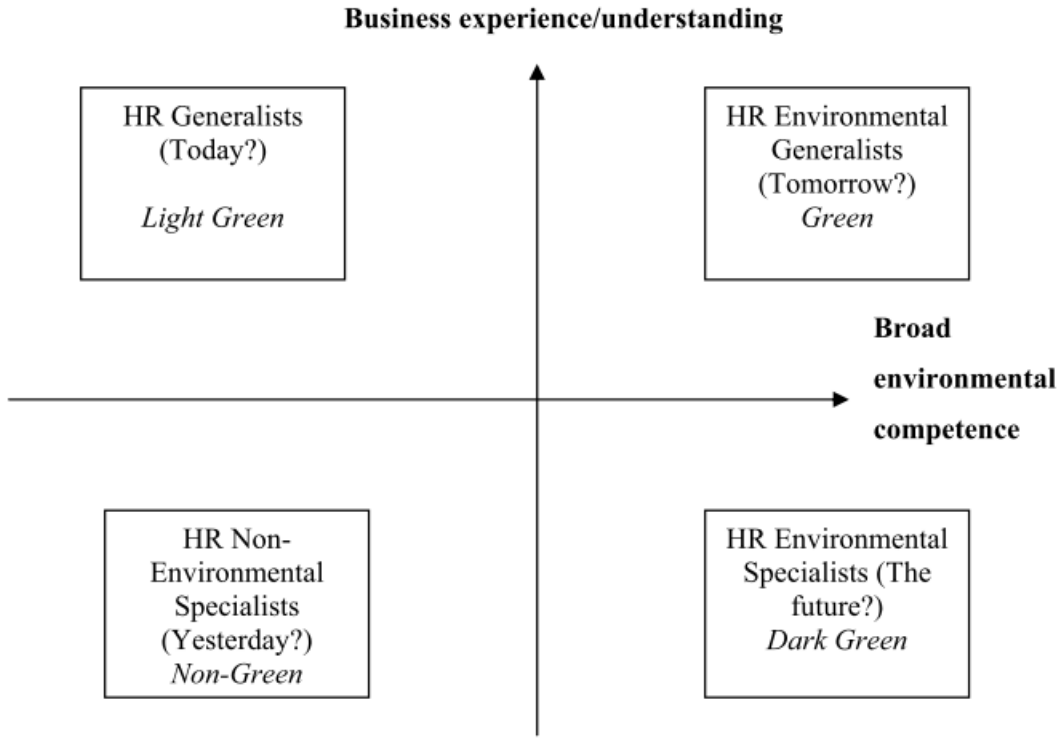
A procedure representation of green human resource management depicts joint cooperation among the green performance and HRM of the firm. If the green credentials of the firm try of HRM can succeed (Renwick at El, 2008). HRM should recruit very sensibly until educated people applying for the job themselves get knowledge of how to work in such firms. (Renwick et al., 2008), other things can also play in to the green performance of the firm such as audit development, green information system and appraisals, etc. (Briscone and Marcus, 1997; Maxwell, Rothenberg).

Firstly, an advanced HR system can motivate the HR to introduce greener policies actively. Employees should also be involved with Green steps. (CIPD, 2009a: u) Furthermore, a survey shows that only 23% of HR professionals truly feel or care about environmental issues, 46% think that HR should play a guide or mentor role, and 23% of providing facilities to achieve this end. (Brockett, 2006)

Secondly, more advancement on environmental reports should be the best improvement to motivate management and employee's implantation on green HRM. There are many proposed measures such as policy statement aims, progress check, overall effect measures, flexible working, transport, recycling, and energy saving (CIPD, 2007, smith and Davies, 2007). Wehrmeyer shoes the significance of factors of work attitude, personal inspiration towards firm, and mutual relations of management and employees.

According to HR Managers and their approach towards Green HRM there are various views categorized to different roles detailed in Figure Below related to their actual positions and future directions.

Figure 1: Shades of Green – A typology of HR environmental executives



(Adapted from James and Stewart, 1996: 145).

To achieve maximum staff co-operation the role of HR environmental executive should be to design a problem finding and solving system as well as implementing environmental policies (Parker, and Wehrmeyer 1996), moreover HR should unify HRM and EM (environment management) in training minimizing status differences and employment screening, etc. (Rothenberg, 2003)

Accurate dimension is crucial in the direction of understanding the recital output between human resource management and natural activities. The function of human resource management can be judged by vital performance measures named 'hard' and 'soft' performance measures. According to Wagner, 2001) personal function too can play there in enforcing environmental management for better performance.

Assess "hard" considered in conditions of efficiency, for example (sales per employee) and monetary recital, for example (return on assets, return on sales) and performance during the future such as the dimension in innovative work and success (patent counts, research and development expenditure), and closes connection with particular collection of human resource management practices and their economics

effects on elevated recital system. While 'soft' measures are used to improve the overall impact of HRM practices (Wagner, 2011),

It refers to the fact that economic benefits are always expected from environmental activities. It can also be judged through employee satisfaction, retention, and recruitment, e.g., Egri and Hornal (2002) measured it through the employee morale and employee turnover; moreover, to measure the performance of an environmental firm, environmental activities imitated by HRM could be seen to be a general success of organization recital (Daily and Huang, 2001; Daily, 2007; Jabbour & Santos, 2008; Renwick, 2008)

1.3 Research background

The economy has fuelled the advancement of science and technology since the Industrial Revolution. In addition to making life more convenient, this raises our level of living and simultaneously improves the public infrastructure. The environment also suffers from the natural risks that the effects of industrialized movement have on both the public and private sectors as a whole, while the economy is growing. Previously, corporations and their shareholders counted on the firm's financial success as the sole determinant of its prosperity. However, this belief is no longer applicable, and companies must now prioritize social and environmental considerations alongside their financial and economic objectives. Thus, corporate environmentalism or "green management" arose as a new strategic concern in the 1990s and gained popularity internationally in the 2000s (Dwyer et al., 2009). Protecting the environment is therefore a top priority while developing resources and boosting the economy. Since they are a vital element of our society and cannot be separated from the environment, business organizations play an important role in environmental management challenges. In the past, they have actually contributed the majority of carbon footprints (Liu, 2010). In recent years, Pakistan has experienced devastating floods, droughts, and cyclones that have killed hundreds of people, displaced thousands more, destroyed livelihoods, and devastated infrastructure. A harsh reminder that Pakistan is one of the most vulnerable nations to the consequences of climate change is the possibility that these and other natural disasters could become more frequent and severe in the coming decades. With 184.5 million people, Pakistan has the sixth largest population in the world. By 2050, it is expected to have an average annual population growth rate of 2%, making it the sixth most populous nation in the world.

Human resource practices are typically organized into systems by organizations in accordance with their culture and business goals (Boselie et al., 2001). Numerous scholars agree that HRM is one of the best methods for fostering the development of human capital, which improves organizational performance and competitive advantage. However, no earlier research could be found on the impact of GHRM on organizational performance in the industrial sector. Overall, a study is required to assess how GHRM affects organizational performance in manufacturing organizations with the use of green human capital, and it is expected that this study will provide new knowledge to the literature on GHRM in the manufacturing sector. Regarding the availability of primary data and the few organizations that use GHRM, several researches are insufficient. According to the study by Jabbar & Abid (2015), most Pakistani organizations are completely unaware that GHRM exists (Jabbar & Abid, 2015).

1.4 Green HRM

The growing concern about environmental sustainability has made companies more aware of their environmental impacts. Highly polluting sectors, which are under great pressure from these problems, are particularly affected by this occurrence (Masri and Jaaron, 2017). This study saw green human resources management (GHRM) activities as a "bundle" that could enhance the sustainable performance of a firm, in contrast to previous research that indicated that GHRM concentrated on individual practices (Longoni et al., 2016). However, the corporate sector is now seeking to actively become involved in embracing eco-friendly methods, as they recognize the seriousness of this situation. To begin with, they incorporated "Go green" techniques into their company goals. Since human resources dominate organizational operations, it is imperative to combine HR practices with environmental management to achieve environmental sustainability (Margaretha & Saragih, 2013). In organizational settings, the idea of going green is very useful. The same idea should be introduced for environmentally friendly activities within different organs of an organization. The environmentally friendly way is being adopted by more and more organizations. Organizations are now quite concerned about green HRM as it helps in the development and implementation of green strategies. (Sandeep, 2013, Graves and Sarkis, 2018).

In its annual report for 2021, the Global Climate Risk Index ranked Pakistan as the eighth country most affected between 2000 and 2019.

CRI 2000-2019 (1999-2018)	Country	CRI score	Fatalities	Fatalities per 100 000 inhabitants	Losses in million US$ PPP	Losses per unit GDP in %	Number of events (2000–2019)
1 (1)	Puerto Rico	7.17	149.85	4.12	4 149.98	3.66	24
2 (2)	Myanmar	10.00	7 056.45	14.35	1 512.11	0.80	57
3 (3)	Haiti	13.67	274.05	2.78	392.54	2.30	80
4 (4)	Philippines	18.17	859.35	0.93	3 179.12	0.54	317
5 (14)	Mozambique	25.83	125.40	0.52	303.03	1.33	57
6 (20)	The Baha-mas	27.67	5.35	1.56	426.88	3.81	13
7 (7)	Bangladesh	28.33	572.50	0.38	1 860.04	0.41	185
8 (5)	Pakistan	29.00	502.45	0.30	3 771.91	0.52	173
9 (8)	Thailand	29.83	137.75	0.21	7 719.15	0.82	146
10 (9)	Nepal	31.33	217.15	0.82	233.06	0.39	191

Figure 2: The Global Climate Risk Index 2021(Source: the author)

The Global Climate Risk Index (CRI) is an annual report produced by German watch, an independent development and environmental organization. The CRI ranks countries based on the impacts of weather-related loss events (such as storms, floods, heat waves) and the extent to which these are influenced by human-induced climate change. It also looks at the vulnerability of countries to these impacts and the level of readiness to deal with them.

The CRI is based on data from the Munich Re Nat Cat SERVICE, which is the most comprehensive database on natural disaster losses worldwide. The CRI uses a methodology that considers both the number of deaths and the economic losses caused by extreme weather events. The countries are ranked based on the average of the last 10 years.

The CRI has been published since 1999, and the latest report was published in January 2021.

Figure 2 shows that Pakistan has recently witnessed devastating floods, deficiencies, and cyclones that have killed thousands of people, displaced thousands more,

destroyed livelihoods, and devastated infrastructure, leading to losses per unit of GDP of 0.52 between 2000 and 2019. A harsh reminder that Pakistan is one of the nation’s most vulnerable to the consequences of climate change is the possibility that these and other natural disasters could become more frequent and severe in the coming decades.

Pakistan's manufacturing industry is diverse and includes a range of sectors such as textiles, clothing, leather, pharmaceuticals, chemicals, food and beverages, construction materials, and heavy machinery. The textile and clothing sector are the largest and most important sector, accounting for approximately 60% of Pakistan's export earnings. Pharmaceuticals: Pakistan has a rapidly growing pharmaceutical industry, which is the fourth largest in terms of volume and the thirteenth largest in terms of value in the world. Pakistan's food manufacturing industry encompasses a wide range of products, including processed food, confectionery, and beverages. The sector plays a vital role in bolstering the nation's economy by creating job opportunities and facilitating export activities. Some of the key subsectors within Pakistan's food manufacturing industry are: Dairy: Pakistan is the fourth-largest milk producing country in the world and has a large dairy processing industry.

In 2021, Pakistan's gross domestic product (GDP) was estimated to be valued at 346.34 trillion US dollars. Pakistan's GDP accounts for 0.26 % of the global economy. Between 1960 and 2021, Pakistan's GDP increased by 89.76 USD billion on average, with a record high of 356.13 USD billion in 2018 and a record low of 3.75 USD billion in 1960. By the end of 2022, Pakistan's GDP is expected to reach 360.19 billion USD. Pakistan's GDP is expected to grow steadily over the long term, trending between 372.80 USD billion in 2023 and 391.44 USD billion in 2024. Pakistan's GDP from manufacturing industries jumped from 1667362 PKR million in 2020 to 4817690 PKR million in 2021. Based on the predictions of experts and global macro-models from Trading Economics.

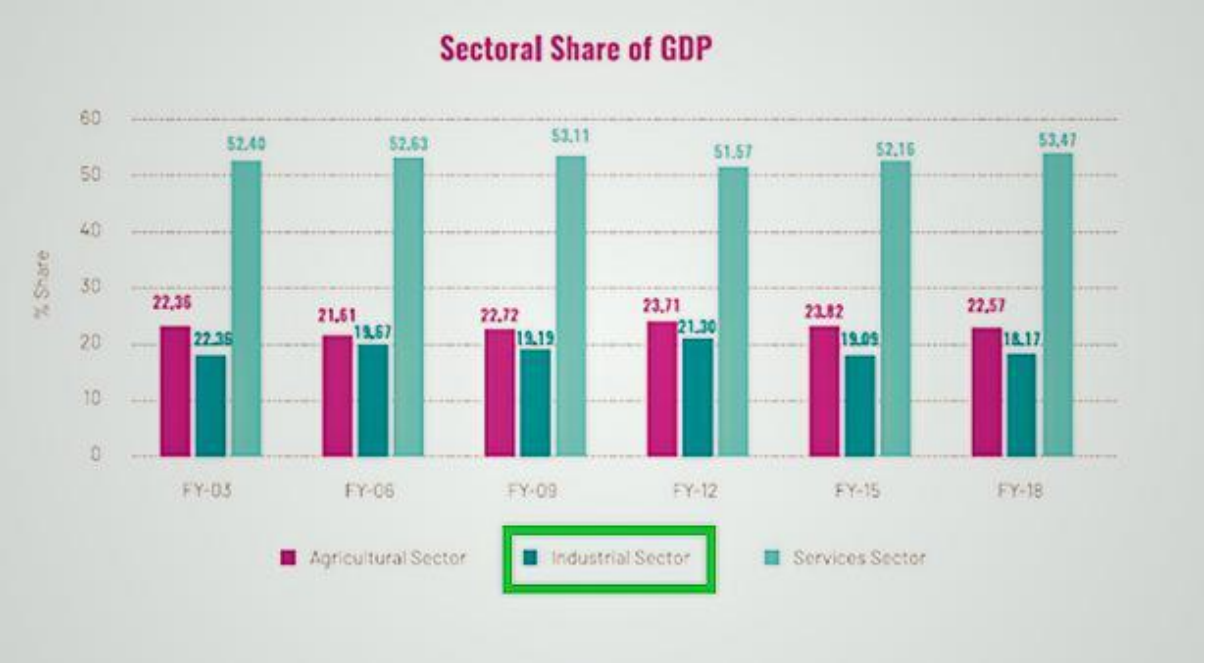


Figure 3: Sectoral share of GDP

Source: https://www.pbc.org.pk/research/pakistan-economic-trade-manufacturing-data/

Figure 3 illustrates three distinct sectors in Pakistan's gross domestic product in terms of their sectoral GDP shares (GDP). More specifically, since FY12, the industrial sector's share of the GDP has decreased. For the past 16 years, this sector's contribution to GDP has been relatively low and stable at 20%.

Undoubtedly, the effect of manufacturing companies on the environment increases, contributing to the demands for sustainability activities that address social, economic, and environmental demands (Hussain et al., 2018; Abdullah et al., 2015; Diabat et al., 2013). Manufacturing companies can have a significant impact on the environment. This can include pollution from the release of chemicals and other pollutants into the air and water, as well as the destruction of natural habitats through the extraction of raw materials and the construction of facilities. Additionally, manufacturing companies can contribute to climate change through the release of greenhouse gases during the production process. However, many companies are now taking steps to reduce their environmental impact, such as through the use of renewable energy sources, recycling and waste reduction programs, and the development of more sustainable production methods. It is viewed as a complex and, in some situations, 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 global emissions, steadily rising (Shahzad et al., 2017). It is also of considerable importance to stakeholders. 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). Although human resources are well recognized to play a significant role in achieving sustainable performance, previous researchers have focused primarily on different HRM strategies to implement a green approach to sustainability (Labella-Fernandez & Martnez-del Ro, 2019).

However, in developed and developing countries, the manufacturing industry is a source of various types of environmental pollution that involve critical evaluation, inspection, and correction of its managerial activities (Rehman et al., 2016). Due to the multiplier effect and the role of the manufacturing sector in economic development (Marconi et al., 2016; Szirmai and Verspagena, 2015), the environmental impacts of this critical sector are increasingly required for environmentally sustainable practices. Adopting sustainability practices is not limited to specific departments of the organization. In reality, workers are similarly responsible for keeping the environment of their company green in all functions of the organization (Opatha and Arulrajah, 2014; Jabbour et al., 2008). The HR department plays its role in building up the sustainability culture of their organization. Cooperation, innovative management, and playing tools have a close connection with quality and facilities. (Shusma, 2014). A green organization is a place fully environmentally friendly, fully resource-organized and responsible. There can be different definitions for the impression of green management to make a balance between organizational growth for wealth design and protecting natural environment for the future (Daily, 2001). Therefore, managers must involve 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).

Although 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, Shoaib et al., 2021; Sharma and Gupta, 2020), 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 kinds of green human resource management activities should be connected with the environmental policies of manufacturing companies to promote their green corporate culture. The current study aims to empirically analyze and quantify GHRM activities in sustainable performance 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 package of so-called green human resource management, including unalterable and adherent human resource management practices) increases environmental efficiency by incorporating concepts of ecological standards within the organization, according to a recent analysis of different scientific studies. Put simply, the implementation of bundle Green Human Resource Management (GHRM) practices is believed to positively impact the environmental sustainability efforts of a company. This study further views the green human resource management bundle as a cohesive set of HR activities that significantly affect the achievements of manufacturing industries by:

I. Green hiring (GH).
II. Green Training and Involvement (GTI).
III. Green Performance Management and Compensation (GPC).

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, Nisar et al., 2021). To increase performance, businesses need to invest in human resources (Wang et al., 2011). Additionally, it makes sense to invest in GHC for organizational growth because employee environmental awareness and applicable skills are crucial for organizational success (Yong et al., 2019). Employees are, in reality, equally liable for sustaining an organization's environmental and green image across all

organizational activities (Jabbour et al., 2008; Opatha & Arulrajah, 2014). In order to protect the environment, managers must include workers at every level of a firm. HR managers must implement GHRM practices to improve environmental performance. Therefore, this study looked at how the practice of GHRM and the impact of green capital on environmental performance are related.

The importance of these experiments often improves if they are conducted in a developing country's demanding climate. Consequently, we must conduct this research to understand further the implementation of GHRM activities in the manufacturing industry to understand the impact of these practices on the sustainable performance of manufacturing organizations.

Groups are being forced to take environmental action by adopting moral and socially responsible behaviors for sustainable performance as a result of increasing pressure from government and non-governmental organizations and community stakeholders (Adebayo et al., 2020). In response to growing demand, organizations are shifting from a conventional profit-driven strategy to an integrated approach that considers economic, social, and environmental objectives in a balanced manner (Saeed et al., 2018). However, environmental deterioration associated with manufacturing has not received much attention in Pakistan due to ignorance. Furthermore, the manufacturing sector in Pakistan gives very little thought to sustainable performance (Tahir et al., 2019). Therefore, it is imperative to take into account how the environmental imprint of the industrial sector affects sustainability (Liebe et al., 2020).

Table 1: Projected Greenhouse Gas Emissions by Sector in 2020 and 2050 Under Business as Usual Scenarios (in MtCO2e)

Sector	1994	2008	2012	2020	2050
Energy	86	157	169	358	2,685
Agriculture	72	120	165	245	1,395
Industrial processes	13	18	14	26	67
Land use change and forestry	7	9	10	14	38
Wastes	4	6	10	7	15
Total national emissions	182	309	369	650	4,200

GHG = greenhouse gas, $MtCO_2e$ = million ton of carbon dioxide equivalent.

Source: Government of Pakistan, Ministry of Planning, Development and Reforms. 2010. *Task Force Final Report on Climate Change*. Islamabad; K. A. Mir and M. Ijaz. 2015. *Greenhouse Gas Emission Inventory of Pakistan for the Year 2011–2012*. Islamabad: Global Change Impact Studies Centre (GCISC).

Figure 4: Sector emission Source: (Chaudhry, 2017)

Figure 4 shows that different sectors in Pakistan have significantly increased their greenhouse gas emissions over time. With this number, we can infer that there is evidence for an increase in CO2 emissions in the near future and beyond. Energy consumption is also a major concern for these industries in Pakistan. Industries rely on fossil fuels for power and transportation, which can lead to emissions of greenhouse gases and contribute to climate change. In addition, the use of inefficient equipment and the lack of energy-efficient practices can lead to higher energy consumption and higher costs for companies. There has been an increase in overall national CO2 emissions (from 1994 to 2050 in all five cases). We may get a general idea of the environmental issues that we have been dealing with recently from the above analysis (compared to the emissions in 2008 and grow by around 4 times by 2050 in the industrial process). Manufacturing companies in Pakistan, particularly in the textile industry, etc., have had a significant impact on the environment. The textile industry is one of the largest contributors to the country's economy, but it also consumes large amounts of water and energy, generates a significant amount of waste, and releases pollutants into the air and water. In fact, the Pakistani government has significant difficulties due to greenhouse gas emissions.

One of the main environmental issues associated with these industries in Pakistan is water pollution. Industries rely heavily on water for various processes such as dyeing and finishing, which can lead to the discharge of pollutants into nearby water sources. These pollutants can include heavy metals, dyes, and other chemicals that can harm aquatic life and make water unsafe for human consumption (Shoaib et al., 2022). Overall, it is clear that these industries in Pakistan have a significant impact on the environment and that steps must be taken to address these issues. This can include implementing stricter regulations and guidelines for water and waste management, promoting energy-efficient practices, and investing in clean energy sources. Additionally, companies in the industry must take responsibility for their environmental impact and take steps to reduce it.

The present study offers several theoretical contributions. This research illustrates three significant theoretical developments. Firstly, it refers to the absence of an observational study on green human resource management (GHRM) practices in the manufacturing firm and a particular circumstance in a developing country (Geng et al., 2017, Zaid et al., 2018). GHRM orientation significantly influences sustainable performance (Mousa & Othman, 2019). Providing empirical evidence of the magnitude of GHRM bundle practices in this vital manufacturing field adds value to the existing body of literature. To my best knowledge, this study is the primary type in the manufacturing sector to be carried out in Pakistan. Second, by including mediation elements, this study broadens our understanding of how GHRM bundles affect sustainable performance. Prior research mainly examined the direct impact of GHRM practices without considering the mechanism of their impact on environmental performance (Longoni et al., 2018, Li et al., 2020). Alkerdawy (2018) proposed using some intervening constructs to examine how GHRM affects sustainable performance. As a result, it is suggested that GHC acts as a mediator between GHRM bundles and sustainable performance. It adds important data from Pakistan to existing GHRM activities and the 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 most 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 evaluation, and compensations (Govindarajulu and Daily, 2004; Daily and Huang, 2001). At that period, the most important study was related to human resources management and ecological management. Wehrmeyer (1996) presented this 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; Shen et al., 2019;).

Green may be said to be the most beautiful color and the color of nature (Prasad, 2013). A visit to green hillside, meadows, or forests always reenergizes our bodies and minds while it reduces the stress of life. So, our goal should be to prosper without missing the soothing company of Mother Nature. Green management is evolving as a result of green movement for protection of the environment which resulted from green management philosophy, polices, and management comprising activities helpful for this idea to minimize the carbon footprints and earn carbon credits, their learning and development, and reward and compensation management (Sharan, 2013). Green human resource management practices refer to the strategies and actions that organizations take to minimize the environmental impact of their workforce while promoting sustainable and responsible behavior among employees. GHRM, which encompasses conventional human resources practices like recruitment, selection, performance evaluation, training, and compensation, incorporates ecological objectives alongside strategic dimensions for HRM (Jabbour et al., 2011) or new forms of work organization (Longoni et al., 2015). These new forms include aspects like organizational culture, teamwork, and employee participation (Kumar and Gupta, 2013; Jabbour et al., 2014; Daily et al., 2012; Liu et al., 2019). 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 workers to follow more sophisticated environmental management techniques. 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, (Jabbour and Renwick, 2020). 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). The use of HRM policies that support the use of resources and also supports causes of environmental sustainability is green HRM. it refers people to corporate environmental schedule policies containing video interviews, video recruiting, etc. to reduce travel requirements. Life style benefits and the workplace can be a part of the green reward to keep people in the green program. (Mishra, 2014). Furthermore, in addition 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, (Ari et al., 2020), 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). Additionally, GHRM can inspire employees and this inspiration could lay the foundation for a competitive advantage that results in superior environmental performance (Chiappetta et al., 2017). According to Firdaus and Udin (2014), several companies use GHRM to improve their workforce and bottom line. Along with the environment, GHRM also improves talent retention (Patel, 2014). The need to make "greening" functions the primary factor in improving financial and environmental performance was underlined by Haddock-Millar et al. in 2016. Furthermore, Wagner (2013) asserted that companies that invested in social responsibility saw measurable gains in terms of employee and customer satisfaction, better hiring practices, and innovation, all of which are likely to improve the social performance of the company. Rezaei-Moghaddam (2016)

noted that industrial companies that invested in social programs strengthened GHRM. For businesses, ensuring social performance involves incorporating social activities into their production processes, which in turn can enhance the positive effects of plant actions on both internal communities (such as employees) and external communities (such as customers and suppliers) (Pullman et al., 2009). In summary, green human resource management practices encompass proactive measures aimed at mitigating the environmental impact caused by an organization's workforce, while fostering sustainable and responsible behavior among employees. These practices enable organizations to minimize their carbon footprint, preserve natural resources, and contribute to sustainable development.

Table 1 Green human resource management bundle.

GHRM bundle Practices	**GHRM bundle Practices Definition**
GH	Adoption of environmental requirements in the process for selection and recruitment (Renwick et al., 2013; Jabbour and Santos, 2008).
GTI	Improving the framework of incentives and competencies, strengthening organizational efficiency and enhancing dedication to sustainability programs, encouraging workers to engage in environmental change (Daily et al., 2012).
GPMC	Reward and control programs for employee help for EMs (Berrone and Gomez-Mejia, 2009).

(Source: the author)

2.1.1 Green hiring

Employers with green initiatives must focus on finding candidates who understand and are enthusiastic about environmental protection practices (Renwick et al., 2013). The role of business firms is very vital in environmental issues, as it is an undeniable fact that without environmentally friendly management the future generation will be a serious threat. The leading companies must also realize that they themselves are the real cause of carbon footprints and damaging the environment. Therefore, now they are using every opportunity to reduce harmful environmental destruction inspections by exploring and introducing environmentally friendly technologies such as biotech products and searching for environmentally friendly energy. (Kusku, 2008; Liu, 2010 Ozen). Therefore, it is important to understand that companies must increase the appeal of recruitment due to the growing knowledge of emerging talent. 2009 (Ehnert). Therefore, by doing this, organizations can shape their environmental reputation and foster the perception that they care about the environment (Guerci et al., 2016). Therefore, companies must market their vision for green growth, past environmental performance, and policy to attract potential employees to apply for employment. This is done by hiring the right person with an awareness of environmental problems. Along with environmental assignment, necessary abilities, and knowledge to carry out environmental activities, a thorough job description should also be included in the ad (Chaudhary, 2018). Green hiring refers to the practice of considering an applicant's environmental or sustainability-related experiences, skills, and qualifications when making hiring decisions. One way to verify an applicant's green credentials is by checking references from previous employers, colleagues, or supervisors who can attest to the candidate's experience and expertise in this area. Additionally, an applicant can also provide certifications, awards, or other documentation demonstrating their commitment to sustainability in their work. Therefore, a key component of GHRM practices that stress the development of a workforce that deals with environmental concerns and helps them improve their environmental performance is green hiring (Zibarras & Coan, 2015, Pham et al., 2019).

2.1.2 Green Training and Involvement

GTI has become crucial for any organization because it promotes sustainable development (Pinzone et al., 2019). Additionally, GTI is essential for the successful implementation of the green strategy and cleaner production (Jabbour, 2013, Diana et al., 2017, Omarova and Jo, 2022). Green training refers to education and training programs that focus on environmental sustainability and the implementation of eco-friendly practices. This type of training can be provided to employees at all levels, from entry-level staff to senior management. It can cover a wide range of topics, including energy efficiency, waste reduction, and sustainable procurement. To implement social and environmental concerns practices, companies must do so at each level of employee training and development programs (Mandip, 2012; Mehta & Chugan, 2015). It is crucial to create environmental training programs that take advantage of the advantages of the environment (Cherian & Jacob, 2012). According to a different study, environmental training has a big impact on how environmentally responsible an organization is (Daily et al., 2012). Employees who receive green training and actively participate in environmental initiatives within their organization can be valuable assets to the company. They can help raise awareness, develop, and implement new sustainability initiatives, and drive change. Participation of employees in green initiatives helps businesses project an eco-friendlier image. It serves as a manual for reorganizing your environmental goals, employee motivation, and skill sets needed to address environmental issues, to verify the level of green training and participation of employees, references from previous employers, colleagues, or supervisors can be checked. In addition, employees can also provide certifications, awards, or other documentation that demonstrate their commitment to sustainability in their work and their level of involvement in green initiatives. (Kitazawa & Sarkis, 2000; Florida & Davison, 2001, Lu et al., 2020).

2.1.3 Green Performance Management and Compensation

To improve an organization's economic performance, its environmental performance is crucial (Stefan & Paul, 2008). Green performance management refers to the process of evaluating and managing employee performance with a focus on environmental sustainability. This can include setting sustainability-related goals for employees, providing feedback and coaching on eco-friendly practices, and recognizing and rewarding employees for their contributions to the company's

sustainability efforts. Consequently, implementing a green standard will improve environmental performance (Tang et al., 2018). Organizations must improve the green incentive system for their environmental commitment in order to benefit from green strategy and achieve green goals (Jabbour & Jabbour, 2016, (Jabbour and Renwick, 2020). In terms of compensation, companies can choose to tie employee pay to their performance in meeting sustainability goals and targets. This can be done through bonuses, incentives, or other forms of rewards. This approach aligns the interests of the employee with the company's sustainability goals and objectives. The study found that a company's environmental management could benefit from its green rewards and compensation system, which focuses on preventing unfavorable behavior and encouraging environmentally responsible behavior (Zoogah, 2011). To develop green talents, numerous reward structures are used. In addition to nonmonetary perks like leave and gifts, rewards can also come in the form of monetary benefits like bonuses, cash, and premiums. In addition, recognition-based environmental management rewards might take the form of prizes, meals, promotions, outside positions, and regular compliments. Finally, incentives are determined by feedback and environmental management (Renwick et al., 2013; Opatha, 2013). Another study discovered that offering employees green money increases their dedication to environmental goals and increases the project's sustainability (Merriman & Sen, 2012).

2.2 Human capital

Cantillon (1755) discussed the concept of human capital estimating charges which are rising on a kid till he/she reaches to working age. But Petty in fact introduced it first of all. Adam Smith (1776) took this concept into account in the concept of a general stock of any country. Another definition of human capital is that total investment in activities of the labor market to develop an individual's efficiency, for example, health, education, and training on the job (Becker 1997; Kiker 1966; Schultz 1961).

Human capital, as defined in the Penguin Dictionary of Economics, refers to the collection of skills, capacities, and abilities possessed by an individual, enabling them to generate income. Another perspective describes human capital as the knowledge, skills, competencies, and attributes inherent in individuals that facilitate the advancement of personal, social, and economic well-being (OECD, 2001).

Additionally, human capital may be discussed as the life-time expenditures or investments on the individual on his/her inborn intrinsic potential to convert them into practical skills, knowledge, abilities, etc. (Laroche et al., 1999)

Beck (1975) took human and physical capital as the same thing. Human capital is the skills abilities and physical capital is the assets such as machine equipment, and factory. through investment both can be bettered for more productivities and capacities such as individual professional knowledge or expanding factory and purchase power for equipment. (Beck, 1975)

According to Blaug (1976) human capital investment is the investment by an individual for himself not for present gains but for future economic rewards such as education, working experience, on-job training job searching process, etc. increasing his abilities and productivities. By becoming more aware of job searching methods, there will be least risks of unemployment. It will also win him a better rewarding rate for his labor. (Blaug, 1976)

The founder of human capital theory Schultz (1982) takes it as the accumulated amount of productivities to increase the future revenue, managerial skills, and consumption satisfaction. With better knowledge and skills, personal productivity to work more efficiently compared to any other person who has yet not acquired such abilities or skills (Schultz,1982).

2.2.1 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).

An expectation is that training plans can improve green expertise and increase skills when interested in operations. Therefore, green human capital helps a company understand its intangible assets (capabilities, skills, knowledge, and expertise) and can help execute green solutions to compete well in a diverse and competitive world. The translation of an organization's priorities at all levels and its realization depend on the top management's involvement (Williams, Morrell, & Mullane, 2015). The participation of top management in the adoption of green innovations is critical (Yusliza et al., 2019). It has been suggested that sustainability skills and expertise of employees significantly add to the adaptation of GHRM practices (Campbell et al. 2012), and other hands, it is often shown that the knowledge and skills of employees also polish as employees consider an organizational commitment to sustainability (Bakshi and Chahal,2014). Due to the intangible nature of assets involved in Green Human Capital (GHC), such as knowledge, skills, capabilities, creativity, wisdom, experience, attitude, and employee commitments, they play a vital role in attaining business success in today's highly competitive market. However, there is limited understanding regarding the specific mechanisms through which Green Human Resource Management (GHRM) practices influence employees to exhibit environmentally friendly behavior (Cahyono and Hakimn, 2020; Yusliza et al., 2020; Kim et al., 2019). Therefore, it is argued here that the partnership between GHRM and employee engagement mediates green human capital (Delgado-Verde et al., 2014). A model of green human capital mediation suggests that the relationship between GHRM practices and sustainable performance is mediated by the development of green human capital. In conclusion, green human capital is the knowledge, skills, and abilities of people who are focused on promoting sustainable

development and reducing the negative impacts of human activities on the environment. Investing in green human capital is essential for creating a sustainable future and addressing environmental challenges.

2.3 Sustainable performance

Although sustainable performance is receiving significant attention at both the micro- and macroeconomic levels, its connection to green human resource management is still a subject of research (Yong et al., 2019). Sustainable performance refers to the ability of an organization or system to maintain and improve its performance over time while also being environmentally and socially responsible. This includes considering factors such as energy efficiency, resource management, and social impact. It also includes the ability to adapt and respond to changes in the external environment, such as new regulations or shifting consumer preferences. Innovative organizations around the world have recognized green management and its drivers as crucial concepts. The distribution of resources is based on a commitment to sustainable practices, which also guarantees long-term prosperity-promoting conditions. It is now widely acknowledged that staff members can contribute to sustainable practices in any organization by adopting support for green activities (Suleman et al., 2021).

In business processes, SCM, and HRM, the term sustainability has become 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, sustainability philosophy, specifically TBL, must be embraced to work effectively in the present and 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, Su et al., 2020). According to Ricardo et al. (2011), in order to achieve firm sustainability, GHRM should evolve into human resource strategies, policies, and practices that support the social, economic, and environmental components concurrently. Sustainability in GHRM generally tries to improve performance through innovative environmental management (Jabbour & Santos, 2008). Additionally, it attempts to strike a balance between economic expansion, social justice, and environmental harmony (Bansal, 2005). As a result, to achieve sustainable performance, a company should think about implementing green practices into its daily operations as a means of sustainability and look for opportunities to work collaboratively with its employees to successfully sustain the business without sacrificing its environmental and social performance.

2.4 Green human resource management practices and sustainable performance

Green human resource management (GRM) refers to the integration of environmental sustainability into human resource management practices. This can include practices such as reducing the environmental impact of employee commute, implementing recycling programs in the workplace, and promoting environmentally friendly behavior among employees.

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). The sustainable performance paradigm has emerged to reduce the adverse environmental effects of economic activity by substituting time-consuming procedures with eco-friendly ones (Bombiak & Marciniuk-Kluska, 2018; Zeeshan-Ullah et al., 2021). By implementing sustainable value-oriented and socially responsible business management, companies were forced to consider social and ecological problems in addition to their focus on economic goals (Jaboski, 2016). Thus, combining

economic, ecological / environmental and social performance is what "sustainable performance" is meant (Goran et al., 2018).

In addition to the apparent environmental gains, the introduction of green policies enhances an organization's attractiveness. It contributes to the acquisition of talent, making 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). To achieve company environmental and sustainability goals, HRM practices are crucial (Jabbour & Renwick, 2020). The ability to build green capabilities targeted at reducing waste and pollution-causing activities is better for organizations that strategically focus on training employees to promote green practices (Amrutha & Geetha, 2020). Implementing and maintaining the environmental management system, which enables companies to achieve financial goals, depends on the GHRM practices (Bon et al., 2018). Enhancing collaborative efforts, workforce training, performance evaluation based on environmental objectives, and corporate culture are necessary for sustainable performance (Jabbour & Santos, 2008). Teamwork that prioritizes the environment leads to significant waste reduction and successful corporate environmental performance (Roscoe et al., 2019). Employee participation in green teams leads to a boost in both environmental knowledge and performance, fostering sustainability. Furthermore, these efforts have a substantial influence on financial results, as stated by Harb and Ahmed (2019), Jirawuttinunt and Limsuwan (2019), and Agyabeng-Mensah et al. (2020). Meanwhile, GHRM procedures essentially help spread green culture effectively (Yusoff et al., 2020). The use of GHRM techniques by organizations has helped them gain a competitive edge and improve their triple bottom line, or performance on the economic, environmental and social fronts (Zaid et al., 2018; Mousa & Othman, 2020). GHRM methods have a favorable impact on ecological, economic, and socially responsible outcomes (Longoni et al., 2018). In reality, green HRM is essential to integrating the company's sustainability programs in the hopes of fostering employee skills, motivation, values, and trust in order to attain and preserve the triple bottom line (people, planet, and profit) (Paulet et al., 2021). 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 that companies prefer to promote environmentally environmental management practices and strive for a greener organizational culture with the ultimate objectives of greater efficiency, reduced prices, and an entirely better environment of employee interaction. 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 made 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 the results of manufacturing firms. 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). Furthermore, 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 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.

To improve their environmental management strategy and sustainable performance, organizations implement green human resources management techniques to reduce the environmental impact of manufacturing processes and industrial waste (Ola Hmeedat & Rokaya, 2022; Ali et al., 2022). This study aims to examine the effect of GHM techniques on sustainable performance considering the discussion above. Assume that empowering employees to make environmentally conscious decisions, providing green training programs, and creating green teams result in sustainable performance. Together, green human resource management bundle practices and sustainable performance are closely linked. By promoting sustainable behaviors and practices among employees, organizations can reduce their environmental impact and improve their overall sustainability performance. Additionally, organizations

that are able to achieve sustainable performance are often more successful in attracting and retaining talented employees, as they are seen as responsible and socially responsible organizations. For the sake of sustainable development, it is important to highlight green career advancement prospects, green performance-based rewards, and green performance appraisal management. 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)

The AMO theory was first developed by John C. Flanagan in the 1950s and is often used in the field of organizational behavior to explain why employees engage in certain behaviors in the workplace. It is also used in criminology to explain why people engage in criminal behavior.

The Ability-Motivation-Opportunity (AMO) theory is a model that describes the three factors that must be present for an individual to engage in a particular behavior. The theory states that an individual must have the ability to perform a behavior, the motivation to perform the behavior, and the opportunity to perform the behavior in order for the behavior to occur (Flanagan, J. C. 1954).

Ability: refers to the skills, knowledge, and resources necessary to engage in a particular behavior.

Motivation: refers to the willingness and desire to engage in a particular behavior.

Opportunity: refers to the presence of the appropriate environmental and situational factors that make the behavior possible.

The 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 to understand GHRM 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 involves promoting the community by supporting green initiatives and creating opportunities (O) for employees to participate 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). When the components of GHRM can be put together in a broad theoretical framework that explains how they affect environmental cooperation, those components take on greater significance. In contrast to previous studies, which focused primarily on one particular aspect of GHRM (green training), AMO theory allows us to combine three crucial GHRM factors into a single construct (see, e.g., Jabbour, 2013, 2015; Sarkis et al., 2010). To accurately evaluate the effects of AMO elements on employee participation in environmental cooperation projects, the AMO perspective of GHRM requires a measurement scale that includes the dimensions of ability, motivation, and opportunity (Renwick et al., 2013, 2016). The findings are supported by the theoretical framework, which was created on the premise that caring about how people are managed in green human resources management and the effect of this strategy on performance outcomes. This thesis postulated that by providing employees with unique abilities based on sustainability, fostering their passion, and providing them with additional opportunities to engage in green behaviors, companies can improve their performance over the long term (Akanmu et al., 2020). Beyond what is legally required in terms of environmental standards, organizations may be more driven to invest in green practices outside of R&D, which not only results in the creation of novel products and services that increase their capacity for growth and survival but also significantly increase social and ecological impact. High market performance, improved client satisfaction, a powerful brand, and positive stakeholder attitudes are the outcomes of this, which make it simple to achieve sustainable performance and ensure its survival as long as possible. Furthermore, an organization's commitment to green HRM may benefit its potential to succeed in social responsibility over the long run as a result of its dedication to upholding its obligations to its workers (Agudelo et al., 2019). By understanding and addressing each of these factors, organizations can improve the ability, motivation, and opportunity of employees to engage in environmentally sustainable behaviors. This can include providing training and resources, creating a culture of environmental sustainability, and offering incentives for sustainable behaviors. Furthermore, Jiang et al. (2012b) stressed 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)

The Resource-Based View (RBV) theory is a framework that focuses on the internal resources and capabilities of an organization as a means to achieve competitive advantage. The theory suggests that an organization's resources and capabilities can be used to create a unique and valuable position in the market, which in turn can lead to superior performance (Penrose, E. 1959). The RBV theory has been applied to various fields, including strategic management, marketing, and human resources management. In the context of green human resources management, the RBV theory can be used to understand how an organization's internal resources and capabilities can be used to create a sustainable competitive advantage (Barney, J.B. 1991).

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. Resource-based view theory (RBV) states that a company can increase its competitive advantage by utilizing its human resources, which are unique, valuable, nonreplaceable and non-tradable (Agyabeng-Mensah and Tang, 2021). One key application of the RBV theory in green human resources management is the concept of "green human capital." This refers to the knowledge, skills, and abilities of employees related to environmental sustainability. An organization that has a strong green human capital can use this to create a sustainable competitive advantage by being more efficient and effective in environmental management Delmas (M. & Toffel, M. W. 2008). GHC can therefore be directed towards environmental preservation and then BS because it involves the intangible assets of personnel in terms of their knowledge, expertise, capacities, skills, creativity and commitments as a whole (Sugiyanto and Febrianti, 2021; Chang and Chen, 2012; Chen, 2008). 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). 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. By identifying and utilizing these resources and capabilities, organizations can leverage them to achieve a sustainable competitive advantage and also contribute to the green human resources management. (Allameh, 2018).

2.6. Reviewing previous studies

Annexure 1 (Appendices) is a summary of published studies associated with the GHRM application. GHRM has been considered an emerging topic recently. Some researchers have thoroughly clarified the understanding of GHRM practices (Mousa, S. K., & Othman, M. 2020; Chams, N., & Garca-Blandón, J. 2019; Renwick et al. 2008, 2013, 2015; Jabbour and Santos 2008; Ren et al. 2017), and relationships between green human resource management practices and sustainable performance (Yusliza. et al. 2020; Zaid, A. A. & Jaaron, A. A. 2020; Arqawi, S. et al. 2019; Saqib Yaqoob Malik et al. 2020, Shoaib et al. 2021 & Shoaib et al 2022). The following table is a summary of GHRM-related studies (Table 2).

3.RESEARCH PROBLEM, RESEARCH QUESTION, AND RESEARCH OBJECTIVES

3.1 Research Problem

This study clarifies the roles of the GHRM bundle practices in external benefits with the mediation of green human capital, which has not been investigated in previous

studies. As a developing country, Pakistan faces multiple climate 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 one of the poorest countries in air quality. Rising populations, carbon pollution, and deforestation are factors correlated with these concerns. According to the International Monetary Fund (IMF) study in 2018, the critical reasons for Pakistan's environmental problems are industrialization, deforestation due to the energy crisis, urbanization, the inaccessibility of clean water and the rise of 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 environmental aspects, the lack of environmentally committed workers, green creative initiatives and green practices. There is a need to raise awareness of environmental concerns in all communities and businesses. The US-AEP conducted a study in 1999. Their findings suggested that many of the world's manufacturing activities will be carried out 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 63 billion USD 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.

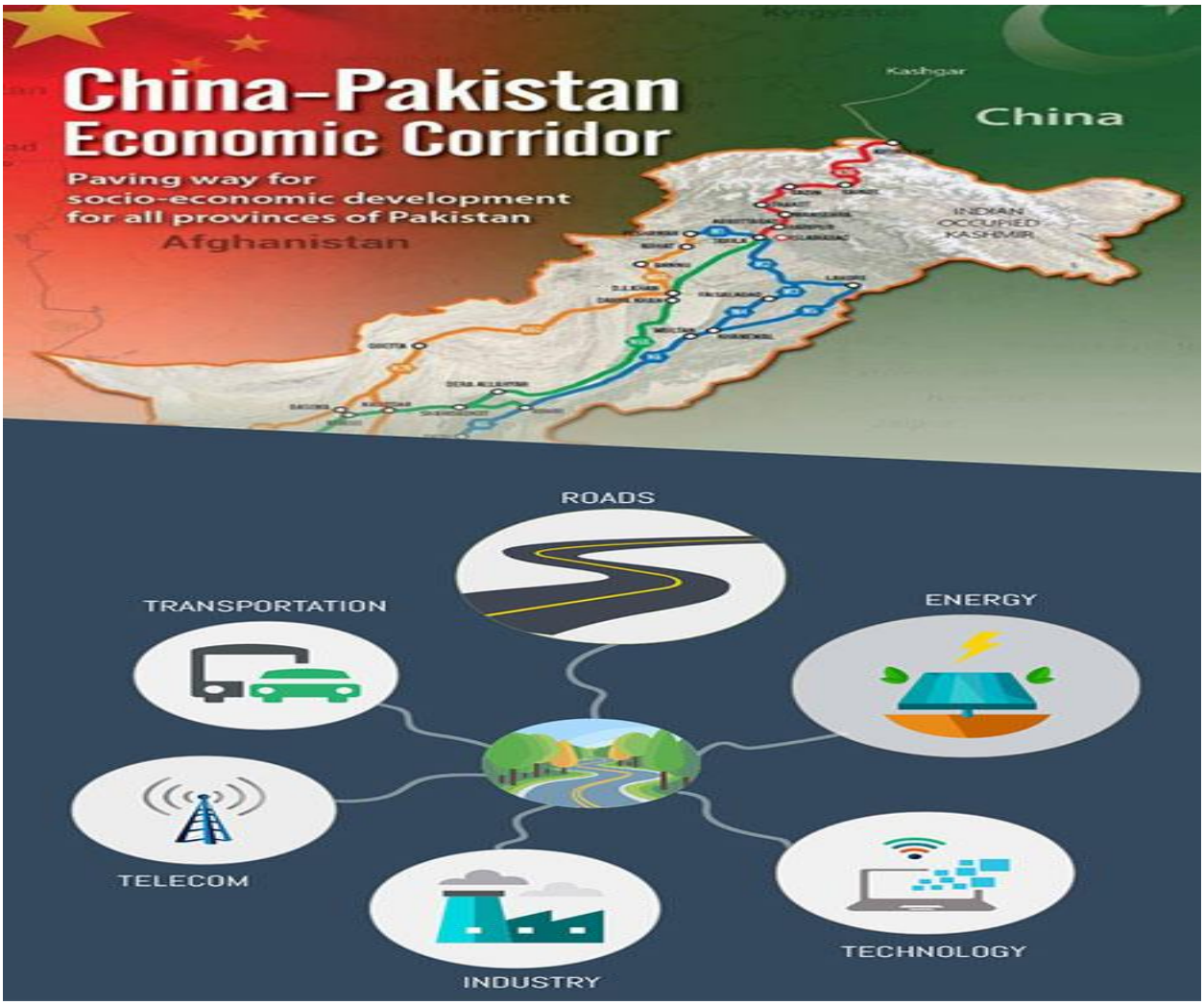


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Figure 5 China-Pakistan Economic Corridor (CPEC) initiative

Source: Ministry of Planning, Development, & Special Initiatives

The role of GHRM in coping with such issues would be crucial in the future. Pakistan is not self-sufficient to deal 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 green HRM practices are adopted in manufacturing

industries, then human capital initiatives may be more effective and useful. Research has shown that the implementation of GHRM practices can lead to the development of green human capital, which in turn contributes to improved environmental and financial performance. For example, a study by Azim et al. (2019) found a positive relationship between GHRM practices and sustainable performance in Pakistani manufacturing firms. The study also found that the development of green human capital partially mediates the relationship between GHRM practices and sustainable performance. It is because all the resources of an organization are used by human resources. According to the Green HRM concept, sustainable use of resources within organizations is encouraged through HRM policies, which more broadly relate 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 above arguments, the research aims to develop a comprehensive model to investigate the effects of GHRM bundle practices on sustainable performance with a model of green human capital mediation 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 does the green human resource management bundle affect green human capital in manufacturing firms?

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

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

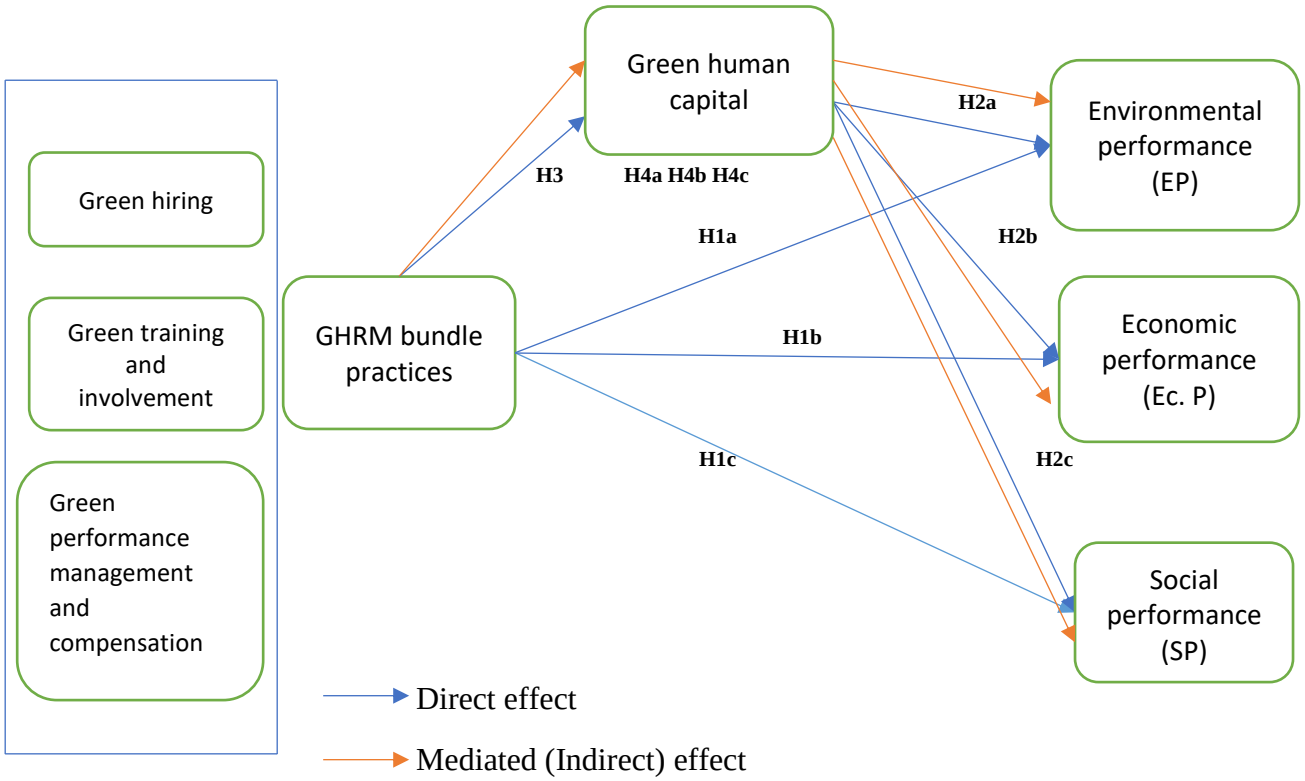
RQ4. Is there a relationship between green human capital, the green human resource management bundle, and sustainable manufacturing performance?

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 the green human resource management bundle on green human capital in manufacturing firms.
RO2. Evaluating green human capital leads to better sustainable performance in manufacturing firms.
RO3. To understand the effect of the levels of green human resource management bundle on sustainable performance in manufacturing firms.
RO4. To find the relationship between green human capital, green human resource management package, and sustainable performance in manufacturing firms.

3.5 Conceptual framework



In this model, GHRM bundle practices were operated as a second-order formative construct with first-order dimensions (see Fig.6).

Figure 6: Proposed research model (Source: the author)

3.6 Hypothesis

3.6.1 GHRM practices and sustainable performance

In leading to the implementation of new sustainable practices, HR practices play a critical role (Da Rosa et al., 2019; Arago and Jabbour, 2017). Recent studies also found positive HRM support to meet green sustainability goals in the organizational stage (Jabbour et al., 2019). Companies with high levels of GHRM practices, such as training and development, performance management, and employee participation, had lower carbon emissions and higher energy efficiency (Den Hartog et al. 2015). Green human resource management practices are essential tasks that encourage the maintenance and deployment of EMs that can help businesses achieve more significant environmental performance (Jabbour and Santos, 2010), mainly where green human resource management practices concentrate on the value of having a workforce that is engaged in environmental concerns that can enhance their EP (Arulrajah et al., 2015). GHRM practices play a crucial role in the dissemination of green culture (Nejati et al., 2017). Another study by Liao et al. (2016) found that companies with strong GHRM practices, such as employee participation and communication, had better environmental performance in terms of reducing waste and improving resource efficiency. Where environmental performance development depends on coordination, staff planning, evaluation, and assessment of environmental goals, corporate culture, and competitive performance will improve organizations' EP (Jabbour et al., 2008), (Iraldo et al., 2009). This might increase the appeal of highly qualified and professional and highly efficient citizens (Patel, 2014). The following theory looks at the GHRM bundle and its constructive interaction with the environmental steps. Therefore, the following hypothesis will examine the positive associations between the green human resource management package and the EP.

H1a: *GHRM bundles positively affect environmental performance.*

Stakeholders, competitors, and culture are significant considerations for company economic and environmental performance (Mishra et al., 2014). There is a strong association between organizational environmental sustainability, environmental conservation, economic performance, and other company management activities (Siyambalapitiya et al., 2018). Wagner (2013) offered quantitative evidence on the

advantages of implementing green human resource management practice, showing a good correlation between green human resource management practices and corporations' Ec.P. Additionally, aligning GHRM practices with sustainability principles will develop organizations' capacity to accomplish their short-term financial targets and future priorities (El-Kassar and Singh, 2019). Environmental practices such as GHRM are correlated with employee skills and engagement that contribute to more significant economic results (Turban and Greening, 1997). Undeniably, recruiting employing and employees involved in sustainable development would inevitably contribute to hiring a talented employee dedicated to environmental concerns. Additionally, a study by Wright and McMahan (1992) found that organizations that used more comprehensive HR bundles had higher levels of employee satisfaction and commitment, which in turn led to better financial performance. Similarly, enhancing employee involvement and contribution to environmental actions and offering green training would improve their knowledge and abilities while improving companies' economic performance (Longoni et al., 2018). Therefore, this study suggests that:

H1b: *GHRM bundles positively affect economic performance.*

Employing a younger staff would allow a company to address environmental problems; thus, a sound effect would be made on certain workers. A healthier picture of the business is something that employees are drawn to, which contributes to them continuing to remain in the firm. Another rise in the workforce will only increase the employee engagement rate (Khurshid and Darzi, 2016). Research has shown that GHRM bundles can have a positive impact on social performance in an organization. For example, a study by Delery and Doty (1996) found that firms that implemented GHRM bundles, specifically standardization and integration, had a positive impact on their financial performance and social performance. Similarly, a study by Harzing and Pinnington (2010) found that organizations that implemented GHRM bundles had a positive impact on their organizational performance, including social performance. The findings of Al Kerdawy (2018) showed that GHRM has a good association with CSR, representing a more socially and environmentally conscious representation of the organization. It should be noted that such interventions can contribute to development and therefore have a beneficial impact on population and climate (Newman et al., 2016), where CSR is related to informal and systemic methods to improve socioeconomic, government, labor, ethical, and environmental

productivity in developing countries (Patnaik et al., 2018). In competitive markets, customer support and loyalty systems can be important for gaining and maintaining customers. Furthermore, it has a positive effect on customer engagement (Park et al., 2014), where engaging in social responsibility can lead to happiness for customers and employees. In conclusion, GHRM bundles can have a positive impact on social performance in an organization. Implementing GHRM practices such as standardization, localization, and integration can lead to improved organizational performance, including better employee satisfaction, commitment, and performance, as well as improved financial performance. Therefore, it suggests that

H1c: *GHRM bundles positively affect social performance.*

3.6.2 Green human capital and sustainable performance

Increased environmental issues should not be overlooked by a company (Yong et al., 2019). Still, the evolving idea of upstream and downstream partners can be useful for companies with high priority sustainable and environmental goals (Glatzel et al., 2009). Therefore, it is essential to research green human capital due to sustainability goals. While the rising business scholarship has illustrated the value of sustainability and business companies' values, there is a need to add the dimension of sustainability, i.e., environmental, economic, and social (Banerjee, 2012). In addition, recent research has also demonstrated the relevance of micro foundations in strategic management, such as strategic implementation, human resource commitments to skills, routines, and value execution (Schoenherr et al., 2015; Felin et al., 2012; Akhtar et al., 2018;). Eisenstat .1996) suggested that adequate human capital could boost businesses' TBL (triple bottom line) performance, while Morgan and Rayner (2018) found an excellent association among green behaviors and employees' environmental awareness. The top-management contribution to sustainability (Banerjee et al., 2004) and top management dedication often impact employee habits (Jabbour and Santos, 2008). The requisite skills that lead to sustainability have been defined by Ehnert (2009), such as personal self-knowledge, understanding of values, the thought of the system, teamwork, and contemplation. Chang and Chen .2013) find that renewable human capital positively impacts the efficiency of green innovation. Furthermore, Akhtar et al. (2015) stated that achieving sustainability and human capital is necessary. The association between

GHC and business survival has, however, not yet been explored by scientific studies. by providing the knowledge, skills, and abilities necessary to implement sustainable practices and make informed decisions about environmental issues. This includes understanding the impacts of human activities on the environment and the ability to design and implement solutions to mitigate those impacts. Green human capital also includes the ability to measure and monitor environmental performance, as well as the ability to communicate and engage with stakeholders about environmental issues. Overall, green human capital is essential for improving environmental performance and promoting sustainable development (Shoaib et al. 2020). As such, this study hypothesizes that:

H2a: *Green human capital positively affects environmental performance.*

H2b: *Green human capital positively affects economic performance.*

H2c: *Green human capital positively affects social performance.*

3.6.3 Relationship between GHRM and green human capital

GHRM plays an important role in the diffusion of environmental ideologies and principles and in the recruitment of competent staff who fully promote environmentally sustainable businesses (Nejati et al., 2017; Jabbour and de Sousa Jabbour, 2016). As Barney (1991) applied, the RBV indicated that HRM practices impact organizational performance by converting employees into an outstanding, substantial and unique resource. The usage of such a resource in business growth guarantees that the organization's priorities will be supported appropriately (Ray et al., 2005). Chen et al. (2009) indicated that the usage of expertise (internal and external) in supply chain processes contributes to an enterprise's goals and supports. In addition, skilled SCM employees can also improve supply chain performance, which contributes to a sustainable competitive edge (Wright et al.

GHRM bundles can have a positive impact on green human capital, which refers to the knowledge, skills, and values that employees possess related to environmental sustainability. Companies with strong GHRM practices had employees who were more knowledgeable about sustainability and more likely to engage in environmentally friendly behaviors (Geng, Y. & Wang, D. 2016). 1994, Ellinger, 2014) proposed that depending on the pool of human capital, may maintain the

comparative edge. Human capital is one of the primary strategic tools for organizational success, according to Subramaniam and Youndt (2005), because the knowledge and skills of employees are essential for managing a company in today's fast-changing climate. Furthermore, Human Resource Theory notes that the more individuals have experience and abilities, the more effective they can be (Davidsson and Honig, 2003). In general, GHRM bundles can be an effective way for companies to promote environmentally sustainable behavior among their employees and build green human capital. Therefore, I hypothesize that**.**

H3: *GHRM bundles positively affect green human capital*

It may also recognize GHRM improvements to organizational performance by enhancing mediating benefits such as green human capital and employee motivation. This claim is reinforced by HRM's behavioural perspective (Jackson et al., 1989). Research has concluded in the previous literature that organizational performance would not benefit explicitly from the implementation of HR practices but rather from employee discretionary efforts (Morrison, 1996). Green human capital is seen as a primary determinant of corporate citizenship and corporate social responsibility conduct in emerging markets (Macke and Genari, 2019; Park and Ghauri, 2015). Katou and Budhwar (2010) note that HRM policies are confirmed by the mediating roles of HRM result, including employee attitude and behaviour, to affect organizational performance explicitly. Harvey et al. (2013) guarantee from the environmental point of view that HRM policies and practices toward the environment will lead to the green priorities of the business by enhancing the behaviors of employees in the workplace (e.g., job satisfaction and organizational commitment) and promoting employee involvement and interaction in green initiatives, which in turn will generate the environmental goals and the other g (e.g., reputation, stakeholder satisfaction and financial performance). This type of human capital can mediate the relationship between Green Human Resource Management (GHRM) practices and economic performance, as it allows employees to implement and manage sustainable practices effectively, which can lead to improved financial performance for the organization. For example, Ren et al. (2017) recently found the benefit of HRM practices in EM that are intended to efficiently translate green awareness, knowledge, abilities, and motivations to staff, which, in turn, is to achieve firm environmental performance. The relationship between green human

capital and GHRM bundle practices is that they work together to drive environmental performance. Organizations with a strong focus on green human capital are more likely to have employees who understand and are committed to sustainability, which in turn makes it more likely that the practices in the GHRM bundle will be effectively implemented and result in improved environmental performance. Additionally, organizations with a strong focus on GHRM bundles practices are more likely to attract and retain employees with green human capital, which can further support their environmental performance. Therefore, I hypothesize the role of green human capital in mediating the influence of green human resource management on sustainable performance.

H4a: *The Green human capital mediates the GHRM bundles practices and the environmental performance.*

H4b: *The Green human capital mediates the GHRM bundles practices and the economic performance.*

H4c: *The Green human capital mediates the GHRM bundles practices and the social performance.*

Green human capital plays a crucial role in mediating the relationship between GHRM bundle practices and social performance. By investing in the development and retention of green-knowledge and skills-based employees, organizations can implement more sustainable practices and improve their social performance. Additionally, organizations that value and promote green human capital are more likely to attract and retain employees who are committed to sustainable development and have a positive impact on society.
In general, the integration of green human capital into GHRM bundles practices and the consideration of its impact on social performance aligns with the sustainable development goals and is essential for organizations to promote environmentally and socially responsible practices.

4. RESEARCH METHODOLOGY

4.1 Overview of the chapter

This chapter describes the tactics and research techniques used to look at economic, social, and environmental performance. As a result, it is necessary to provide a

detailed justification for the method(s) chosen, as well as how the research had conducted. This chapter initially discusses research philosophy, research approach, and research methodology in order to accomplish research objectives. The creation of the instrument and questionnaire design followed this. In addition, the data collection, sampling and research technique process was described. Finally, comprehensive explanations of the statistical methods and data processing stages were provided.

Table 2 Summary of research methodology

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

(Source: the author)

As mentioned above, the research objectives of this study aimed to measure the effects of GHRM practices on sustainable performance with the mediation effect of green human capital in manufacturing firms in Pakistan. Thus, the quantitative method is required 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).

4.2 Research Philosophy

It is necessary to look at the research paradigm in order to propose a suitable research approach. Research methodology refers to the best way to do research to advance knowledge (Collis & Hussey, 2013). According to Collis and Hussey (2013), a paradigm is a set of presumptions that demonstrates a philosophical worldview with regard to a particular field of study. A paradigm is a fundamental collection of assumptions or beliefs that directs our inquiries for a certain study project (Guba & Lincoln, 2005). A paradigm serves many purposes, such as helping professionals understand global problems and challenges from a single point of view. It offers guidelines on theory, practice, and techniques used to address pressing problems (Creswell & Clark, 2017).

Instead of being dedicated to a specific paradigm, choosing a paradigm depends on what one is aiming to achieve (Creswell & Clark, 2017). According to Creswell and Clark (2017), there are three main research paradigms: positivism, interpretivism, and pragmatism. These paradigms are well known and have been applied in studies pertaining to service marketing. The selection of a certain research paradigm for the current study is explained in the section that follows a discussion of these research paradigms.

4.3 Positivist Paradigm

This scenario illustrated how experiments and observation can yield true knowledge (Guba & Lincoln, 2005). Research in positivism maintains that reality is steady and can be observed or characterized using an objective, according to Levine, Sober, and Wright (1987). According to proponents of the positivist paradigm, research done in this way enables one to get a new perspective on a situation to develop, elaborate, extend, or test a theory (Creswell & Clark, 2017). Quantitative research techniques are utilized in the positivist paradigm. Deductive reasoning is the foundation of quantitative research methodology (Collis & Hussey, 2013). In other words, this

strategy entails a means of gathering data and a method of organizing it so that it may be further quantified for statistical analysis. Present research is based on positivist paradigm.

4.4 Research Design

The philosophy of the present study is positivism (basic research). Consequently, the beliefs of words are trustworthy and constructive, and people will quickly notice it. So, credentials to establish and then demonstrate how this particular goal is transformed into finished (Nightingale, 2012). The dissertation takes a deductive approach, whereby the opinions are logically derived from universal evidence. Furthermore, these opinions are recognized or presumed to be established gradually, with the aim of producing a more confident and clearer hypothesis. It is better to practice quantitative research (Daniel, 2011). A survey strategy, a single sample process, was obtained one-time cross-sectional data collection; Saunders et al. (2009) emphasize that the survey strategy is appropriate to apply quantitative data collection and is utilized to measure the relationships between variables and propose the model of relationships.

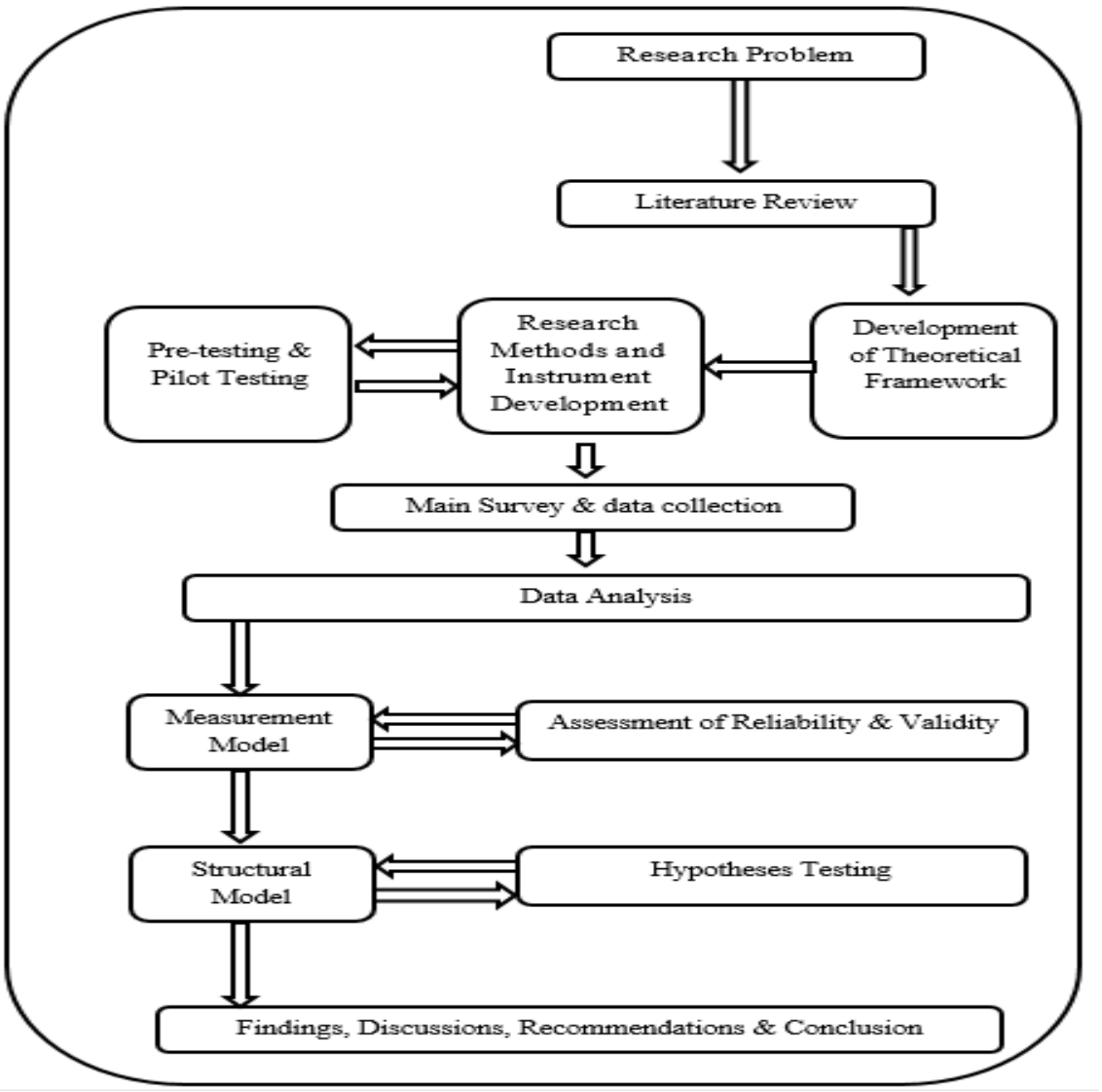


Figure 7: Research Process (Source: the author)

4.5 Sample, Demographics, Data Collection, and Analytic Technique

The quantitative research approach was used. So, the first concern was with the primary data. The questionnaire is considered a sophisticated tool for primary data collection. The questionnaire was adapted from previous studies conducted in this field. The study questionnaire was developed on the basis of the proposed model. It was made in English and distributed to respondents (Senior Managers and Executives, Middle-Level Managers, Other Professional) of related departments such as Production department, Quality assurance department, Administrative departments, HR departments were chosen to collect data. The questionnaire (both

in hard copy and online form) was administered among respondents of the three selected manufacturing firms (i.e. Pharmaceutical, food and textile) based on which produce the highest amount of pollution. The scales used in this study consisted of dimensions and items of green human resource management bundle practices, that is, green hiring (GH), green training and involvement (GTI) and green performance management and compensation (GPC), green human capital, and sustainability.

The research population consists of Pakistani manufacturing firms, that is, small to medium enterprises (SMEs) of (that is, pharmaceutical, food, and textile) chosen from the Small and Medium Enterprise Development Authority (SMEDA). SMEDA is an institution of the Pakistani government. In Pakistan, businesses with 10-250 employees and annual revenue of 250 million PKR are manufacturing companies. Manufacturing firms are preferred because they are more involved in concerns with the environment. In Pakistan, a total of 3.2 million small and medium-sized enterprises are registered, 19.72 percent of which are manufacturing firms operating in Pakistan. It is crucial to note that the analysis unit consists of individual companies. To explore the responses of the respondents, a simple random sampling technique was used. This approach is considered more suitable and efficient as it ensures equal opportunity for sample selection among the study subjects, while also mitigating potential sample bias.

The research proposed that several factors must be carefully considered when determining the sample size for multivariate data analysis, including multivariate normality, missing values, model complexity, estimation techniques, and average error variance of reflective factors (Hair et al., 2010). According to the approach recommended by Hair et al. (2014), the sample size was calculated by multiplying the number of items or statements by 5. Consequently, considering that the study constructs comprised 41 elements, a sample size of 205 was considered necessary for the analysis of the multivariate data. To mitigate non-response bias, the study distributed 750 questionnaires to ensure adequate participation.

Before data collection, an invitation letter was sent seeking approval and referring to respondents to the HR department of the selected organizations. Due to the impact of COVID-19 and the safety policies, the employees worked on a rotating basis, which led to the use of online survey questionnaires as the most appropriate method for collecting responses from participants. The data collection process took place

between October 2022 and January 2023. Of the 750 questionnaires distributed, 525 responses were received, resulting in a response rate of 70%. Following the data cleaning process and the removal of influential outliers, 413 valid responses remained for data analysis. The sample size of 121 is considered sufficient for SEM-partial least squares (PLS) to perform data analysis (Hair et al., 2017). To test the hypotheses, I used SPSS 22.0 and Smart PLS 3.0 to analyse the collected data.

4.6 Measures of variables

Initially, the construction of the green human resource management bundle consisted of three dimensions: GH, GTI, GPC, and 20 items. These initial objects are collected after studying initial questionnaires and the research literature (Guerci et al., 2016; Longoni et al., 2016; Nejati et al., 2017; Siyambalapitiya et al., 2018). All elements were measured using a 7-point Likert scale ranging from 1 (strongly disagreed) to 7 (strongly agree).

To measure the impact of Green Human Resource Management (GHRM) bundle practices on firm sustainable performance, I used a tabular explanation that outlines the key variables, indicators, and their relationships.

Table 3 Summary of Measurement Indicators

Variable	**Indicator**	**Measurement**
Green HRM practices	Adoption of eco-friendly HR policies and practices	Likert scale
	Employee engagement in sustainability initiatives	Likert scale
	Environmental training and awareness programs	Likert scale
	Incentives for sustainable behavior	Likert scale

Green Human Capital	environmental awareness training	Likert scale
	sustainability certifications	Likert scale
	employee engagement in green initiatives	Likert scale
Firm Environmental performance	Introduction of innovative environmental practices	Likert scale
	Compliance with environmental regulations	Likert scale
	Adoption of sustainable commuting methods Reduction in carbon emissions	Likert scale
Firm economic performance	Financial performance - Cost savings (reduced energy costs)	Likert scale
	Innovation and product development	Likert scale
	Reputation and stakeholder perception	Likert scale
Firm social performance	Diversity and Inclusion	Likert scale
	Community Involvement	Likert scale
	Social Responsibility Perception	Likert scale

(Source: the author)

The GHC (green human capital) measurement scale was adopted from Chen (2008). Five green human capital items were measured using a 7-point Likert scale, which ranged from 1 (strongly disagree) to 7 (strongly agree).

A sustainability scale was adopted from (Zhu et al. (2008), Laosirihongthong et al. (2013), Paulraj (2011): a seven-point Likert scale ranging from 1 = strongly disagree to 7 strongly agree.

Table.4 Summary of the adapted measurement model construct

Construct/items	**Code**	**Adapted from**
GHRM bundle practice (Green Hiring)		
Our organisation prefers to recruit employees that have knowledge about the environment.	GH1	Siyambalapitiya et al. (2018)
Applicants for jobs in our organisation are subject to interviews to test their knowledge.	GH2	Nejati et al. (2017)
In our organisation addition to other criteria, employees are selected based on environmental standards.	GH3	Longoni et al. (2018)
In general Job seekers are attracted by the environmental image and policies of the organisation.	GH4	Yusliza et al. (2017)
Our organisation job description includes the environmental aspects of the job.	GH5	Siyambalapitiya et al. (2018)
The recruitment message includes the environmental values of organisations in the job announcement.	GH6	Siyambalapitiya et al. (2018)
Green Training and Involvement		
Training programs about environment are provided to large-scale individuals in the organisation.	GTI1	Nejati et al. (2017)
In general, staff are satisfied with the organisation's green training.	GTI2	Nejati et al. (2017)

Topics offered through green training are modern and suitable for the institution's activities.	GTI3	Nejati et al. (2017)
The organisation provides formal environmental training programs for employees to increase their ability to promote them.	GTI4	Nejati et al. (2017)
Environmental training is a priority and an important investment.	GTI5	Yusliza et al. (2017)
The need assessment for green training helps to familiarise employees with environmental practices.	GTI6	Siyambalapitiya et al. (2018)
Evaluation of green training and development helps to measure the level of green knowledge and awareness of employees.	GTI7	Al Kerdawy (2018)
Environmental objectives contain aspects of green training and development.	GTI8	Siyambalapitiya et al. (2018)
Green Performance Management and Compensation		
Specific environmental goals are adopted by every manager and employee in the organisation.	GPC1	Nejati et al. (2017)
When environmental programs are improved, employees are rewarded for their remarkable ideas.	GPC2	Yusliza et al. (2017)
Employees who have achieved or exceeded the objectives of the environmental institution are rewarded with non-cash equivalents or other cash prizes.	GPC3	Siyambalapitiya et al. (2018)

Section managers reward staff in their departments when they improve environmental programs.	GPC4	Nejati et al. (2017)
Environmental performance is recognized in the public.	GPC5	Yusliza et al. (2017)
One of the criteria employee performance is the achievement of environmental objectives.	GPC6	Nejati et al. (2017)
There are adequate assessments of staff performance after attending courses on environmental topics	GPC7	Siyambalapitiya et al. (2018)
Green Human Capital		
The contribution of the environmental protection of employees in our firm is better than our major competitors.	GHC1	Chen (2008)
Employee competence concerning environmental protection in our firm is better than that of our major competitors.	GHC2	Chen (2008)
The product and/or service qualities of environmental protection provided by the employees of this firm are better than our major competitors.	GHC3	Chen (2008)
The amount of cooperative teamwork on environmental protection in our firm is more than that of our major competitors.	GHC4	Chen (2008)
Our managers fully support our employees in achieving their goals in regard to environmental protection.	GHC5	Chen (2008)
Environmental Performance		
Direct and indirect toxic emissions are reduced in our organisation.	EP1	Longoni et al. (2018)

Our organisation increases the volume of recycled materials and reduces waste.	EP2	Rawashdeh (2018)
Increase the rate of purchase of environmentally friendly goods (eg, medicines).	EP3	Longoni et al. (2018)
Increase activities that protect our natural environment such as the presence of green areas in the institution.	EP4	Al Kerdawy (2018)
Reduced the risk of environmental accidents such as medical waste leakage, poisoning, or radiation emissions.	EP5	Paille et al. (2014)
Economic Performance		
We feel that growth in the organisation's profits in general is due to energy consumption and materials reduction.	Ec. P1	Longoni et al. (2018)
We believe that rise in the market share of the enterprise improves the reputation of the organisation.	Ec. P2	Rawashdeh (2018)
We have confidence to reduce the cost of energy use.	Ec. P3	Zhu et al. (2005)
We believe that reduce processing fees and waste disposal are reduced.	Ec. P4	Zaid et al. (2018a)
Social Performance		
Our organisation increase attention to the rules of the health and safety of employees, especially when using hazardous materials and radiation.	SP1	Abdullah et al. (2015)
We feel that our organisation improving community health and safety and infection control.	SP2	Abdullah et al. (2015)

Our organisation developing economic activities in the community and providing more job opportunities.	SP3	Zaid et al. (2018a)
Our organisation reducing the impact of waste of the organisation on the community.	SP4	Abdullah et al. (2015)
Our organisation improving the quality of service provided, and commitment to the code of ethics.	SP5	Rawashdeh (2018)
Our organisation develops and designs better service and participation of staff initiatives in management decisions.	SP6	Rawashdeh (2018)

(Source: the author)

To control for potential influences on sustainable performance, the study carefully considered the experience and qualification of participants involved in data analysis. These factors were recognized as potentially affecting participants' understanding of sustainable performance. In particular, participants with greater experience and qualification were expected to have a stronger association with these variables. This relationship was likely to be more pronounced for people at higher hierarchical levels and with higher qualifications.

To ensure the validity of the measurement instrument, several steps were taken. First, a pre-test was conducted to evaluate the instrument's content validity, face validity, item flow, wording, and format. Three experts in HRM were engaged to provide their assessment and suggestions for improvement. Based on their feedback, minor adjustments were made to the questionnaire.

Then a pilot test was conducted that included 82 respondents. They were instructed to think aloud and provide feedback on the instrument. This step was designed to ensure that both the researcher and the participants had a similar understanding of the questionnaire. The results of the pilot test confirmed the validity and reliability of the measurement instrument.

The Cronbach alpha coefficient was calculated to assess internal consistency. GHRM achieved a Cronbach alpha value of 0.890, GHC obtained 0.848, and

sustainable performance obtained 0.649. Further details and supporting information can be found in Annexure 3 of the Appendices.

5. DATA ANALYSIS AND RESULTS

5.1 Demographic data of the participants

A total of 413 valid responses were analyzed in terms of demographic characteristics such as sex, age, Industry sector, qualification, and experience. Among the participants, 85% (351) were male, while 15% (62) were female. When considering age groups, 37% (152) of the respondents were under 30 years old. The largest group, which represented 47% (194) of the participants, fell within the age range of 31-40. 11% (45) were between 41-50 years old, and only 5% (22) were over 50 years old. Regarding industry sectors, 33% (135) of the participants were from the textile industry, 35% (145) from the food industry and 32% (133) from the pharmaceutical industry. Of the total participants, 19% (78) had secondary level degrees, 35% (145) had bachelor's degrees, and 46% (190) had obtained master's degrees. Experience wise, the majority of participants had 1-5 years (28%, 115) or 6-10 years (39%, 162) of experience. 14% (57) had 11-15 years of experience, 12% (50) had 16-20 years, and 7% (29) had over 20 years of experience in these industries. (see Table 5).

Table 5. Demographic Profile of the respondents

Sr No.	Demographics	Respondents	%
1	Gender		
	Male	351	85
	Female	62	15
2	Age		
	Below 30	152	37
	31------40	194	47
	41------50	45	11
	Above 50	22	5
3	Industry sector		
	Textile industry	135	33
	Food industry	145	35
	Pharmaceutical industry	133	32
4	Qualifications		
	Secondary	78	19
	Bachelors	145	35
	Masters	190	46
5	Experience		
	1-------5 Years	115	28
	6-------10 Years	162	39
	11-----15 Years	57	14
	16-----20 Years	50	12
	Above 29 years	29	7

(Source: the author)

5.2 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.

5.2.1 Structural Equation Modeling

Researchers can evaluate the model's overall fit using structural equation modelling, as well as test the structural model as a whole (Chin, 1998b; Ramayah et al., 2016). According to Hair (2010), structural equation modeling (SEM) is a collection of statistical models used to understand the connections between various variables. These models can encompass a range of multivariate statistical analyzes such as regression analysis, path analysis, and factor analysis, as described by Gefen, Straub, and Boudreau (2000). In addition, SEM enables analysis in four different ways: (i) modelling associations between various predictors and criterion variables; (ii) creating unobservable latent variables; and (iii) modelling measurement error for observed variables. (iv) Statistically compare empirical results with a prior theoretical and measurement supposition (Chin, 1998b). As a result, this study uses structural equation modeling to measure the causal relationship between constructs.

5.3 VB-SEM Analytical Approach

The purpose of the current study investigating the effects of GHRM bundle practices on sustainable performance with a green human capital mediation model in the manufacturing sectors of Pakistan. It is explanatory in nature and places more emphasis on theory testing than theory development. The best course of action is, therefore, to use PLS-SEM. PLS-SEM is the appropriate methodology when the objective of the research is to develop a theoretical framework and generate predictions. Another term used to describe this procedure is soft modeling. According to Sosik, Kahai, and Piovoso (2009), the goal of soft modelling is to maximize the covariance between latent variables and uncover the best predictions of correlations between variables. PLS-SEM is also reliable and effective at analysing data with non-normal distribution. As a result, VB-PLS-SEM is the best methodology for this investigation given its purpose.

5.4 Data Distribution

Examining the data for normality is one of the most crucial steps. Before applying multivariate data analysis tools, this assessment is essential. Using skewness and kurtosis, the normality of all variables in this study was assessed. A normality test is not necessary for SEM, though, especially when the sample size is large. Invalid statistical test results are the cause (van Zyl, 2018; Oppong & Agbedra, 2016). Histograms are compared to the indices to determine whether the distribution of the variables is normal, as determined by the kurtosis and the skewness value. According to (Hair et al. 2010), the most common and important test value for kurtosis and skewness is between 2.58 and 2.58. All the kurtosis and skewness numbers in Table 6 are within the predetermined ranges.

Table 6: Scores of Skewness and Kurtosis

Variable Name	Skewness	Kurtosis
Green Hiring	−.522	.351
Green Training & Involvement	−.236	−.196
Green Performance & Compensation	−.109	−.256
Green Human Capital	−.353	.095
Social Performance	−.560	−.548
Environmental Performance	−.650	1.065
Economic Performance	−.249	.132

(Source: the author)

5.5 Common Method Variance

Statistical corrections must be used, according to Podsakoff et al. (2003), to guarantee that common method variance will not alter the study outcomes. Thus, the CMV issue was investigated using Harman's single factor test. The results of

unrotated factor solutions are examined using Harman's single-factor test to ascertain how many factors are responsible for the variance in the variables (Koh & Kim, 2003). This method has been used and recommended in studies connected by numerous researchers, including Podsakoff et al. (2003), K. N. Shen et al. (2010), and Leimeister et al. (2006). The covariance account for a single factor should not be more than 50% in order to analyse common method bias (Podsakoff, Bommer, Podsakoff, & MacKenzie, 2006). Table 6 displayed the CMV's findings using Harman's.

Table 7: Harman's Single-Factor Solution

Total Variance Explained

Component	**Initial Eigenvalues**			**Extraction Sums of Squared Loadings**		
	Total	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**
1	10.422	29.777	29.777	10.422	29.777	29.777
2	3.775	10.786	40.563			
3	2.886	8.245	48.808			
4	2.579	7.367	56.175			
5	2.055	5.871	62.047			
6	1.887	5.393	67.439			
7	1.468	4.194	71.633			
8	1.266	3.618	75.251			
9	1.014	2.898	78.148			
10	.902	2.577	80.725			

(Source: the author)

The outcome of Harman's single factor solution reveals that just 29.777%, or less than 50%, of the total variance is accumulated in the first component. This demonstrated that the variance of the common technique in this study is not likely to be a problem.

5.6 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 indictor 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 8. presents the Cronbach, s Alpha (CA), Composite Reliability (CR), and Average Variance Extracted (AVE)

Model Construct	Measurement Items	Loading	CA	CR	AVE

Green Hiring	GH2	0.850	0.853	0.899	0.641
	GH3	0.729			
	GH4	0.785			
	GH5	0.805			
	GH6	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			
Green Performance & Compensation	GPC2	0.700	0.912	0.849	0.529
	GPC3	0.695			
	GPC5	0.777			
	GPC6	0.754			
	GPC7	0.707			
Green Human Capital	GH2	0.825	0.876	0.891	0.672
	GH3	0.834			
	GH4	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			

(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.

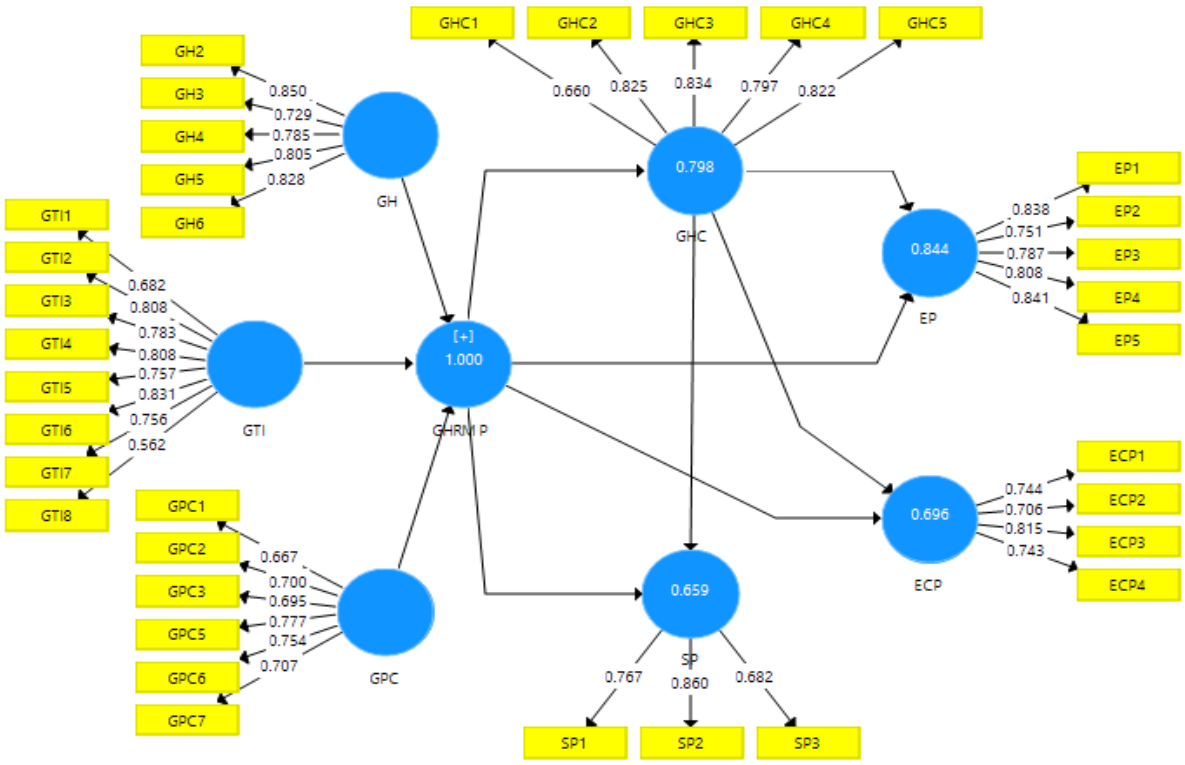


Figure.8 Path analysis model (Extracted from SmartPLS 3.0) Source: Author

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.

5.7 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.

5.7.1 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 8), 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.

5.7.2 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 9).

5.7.3 Composite Reliability (CR)

However, due to the issue of underestimation associated with Cronbach's α, there is a requirement for a more accurate estimation of true reliability (Garson, 2012). As presented in Table 9, my model satisfactorily achieved the desired values of CR (> 0.7) for confirmatory purposes, as suggested by Hair et al. (2019).

5.7.4 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 9 are well above the defined criteria to prove the convergent validity of the constructs.

5.7.5 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 9 that all HTMT values were not as per the required criteria, so discriminant validity of the measurement model was not established.

5.7.6 Quality of the measurement model

The measurement model's predictive validity, which is determined by the values of communality (H2), was found to be consistently positive across all blocks (as shown in Table 9). This ensures the high quality and accuracy of the measurement model's predictions.

Table 9. Reliability, Validity, and Quality of the Measurement Model

	CA	CR	AVE	H^2	HTMT			
					ECP	EP	GHC	SP
ECP	0.746	0.839	0.567	0.441	-			
EP	0.864	0.902	0.649	0.599	0.997	-		

GHC	0.849	0.892	0.624	0.552	0.903	0.964	-	
SP	0.670	0.815	0.597	0.346	1.010	0.977	0.873	-

(Source: the author)

5.8 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.

5.8.1 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 10 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.

5.8.2 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 10 showed that none of the OW was insignificant.

5.8.3 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 10 that all indicators had FL > 0.5, taken together significance and relevancy confirmed the reliability and validity of the formative measurement model.

Table 10. Reliability and Validity of the Formative Measurement Model

Item / Indicator	VIF	FL	FL - P	OW	OW – P
GH2	2.281	0.850	0.000	0.262	0.000

GH3	1.615	0.729	0.000	0.223	0.000
GH4	1.847	0.786	0.000	0.248	0.000
GH5	1.923	0.805	0.000	0.261	0.000
GH6	2.146	0.828	0.000	0.254	0.000
GPC1	1.407	0.667	0.000	0.207	0.000
GPC2	1.497	0.700	0.000	0.222	0.000
GPC3	1.444	0.695	0.000	0.227	0.000
GPC5	1.693	0.777	0.000	0.258	0.000
GPC6	1.629	0.754	0.000	0.250	0.000
GPC7	1.475	0.707	0.000	0.227	0.000
GTI1	1.596	0.682	0.000	0.150	0.000
GTI2	2.300	0.808	0.000	0.181	0.000
GTI3	2.165	0.783	0.000	0.168	0.000
GTI4	2.505	0.808	0.000	0.179	0.000
GTI5	2.138	0.757	0.000	0.165	0.000
GTI6	2.403	0.831	0.000	0.187	0.000
GTI7	1.877	0.756	0.000	0.167	0.000
GTI8	1.377	0.562	0.000	0.122	0.000

(Source: the author)

5.9 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 8.

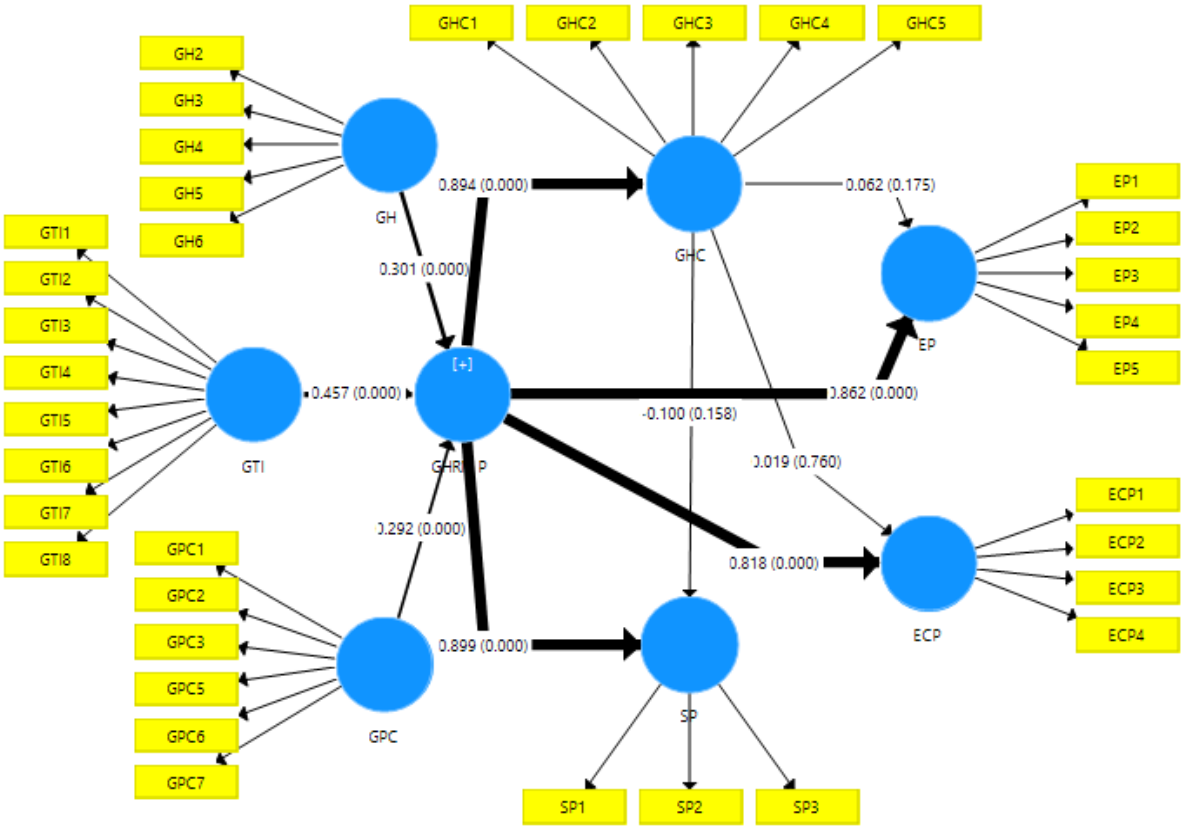


Figure 9: Structural Model (Source: the author)

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.

5.10 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).

5.10.1 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 11 provides the critical values for significance in both the two-tailed test and the one-tailed test.

Table 11. Hypothesis Testing Results

Path	B	SE	T	P	F^2	Status
GHRM P → EP	.862	.045	19.358	.000	.955	H1a: Supported
GHRM P → ECP	.818	.056	14.549	.000	0.436	H1b: Supported
GHRM P → SP	.899	.066	13.641	.000	0.474	H1c: Supported
GHC → EP	.062	.046	1.360	.175	0.005	H2a: Not supported.
GHC → ECP	.019	.061	0.305	.760	0.000	H2b: Not Supported
GHC → SP	-.100	.071	1.412	.158	0.005	H2c: Not Supported
GHRM P → GHC	.894	.014	63.597	.000	3.962	H3: Supported
GHRM P → GHC → EP	.056	.041	1.356	.176	-	H4a: Not Supported
GHRM P → GHC → ECP	.017	.055	0.305	.761	-	H4b: Not Supported
GHRM P → GHC → SP	-.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 11 and Figure 8 for details.

The proposed hypothesis (H1a, H1b, H1c, H2a, H2b, H2c and H3) were examined and presented in Table 11. 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= (β = .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 (β = .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 = (β = .062, t = 1.360, p = .175) with an indistinguishable effect size (F2 = .005), GHC--> Ec. P (β = .019, t = .305, p =.760) without effect size (F2 = .000), GHC--> SP = (β = -.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 (β = .056, t = 1.356, p = .1761), GHRM bundle-->GHC --> Ec. P (β = .017, t = .305, p = 0.661), GHRM bundle-->GHC -->SP (β = -.089, t = 1.398, p = .163), with the mediated role of green human capital (GHC).

5. 11 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 12 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 12. Quality Measures of the Structural Model

Outcome Variable	Q^2	Adjusted R^2	VIF
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).

Enhancing awareness and adaptability necessitates the widespread sharing of knowledge regarding sustainable development. Hence, non-governmental entities have played an active role in conducting training sessions and workshops for various

stakeholders such as organizations, communities, media outlets, and government officials. By assuming roles as advocates, activists, researchers, representatives, trainers, information providers, and watchdogs, NGOs wield substantial influence in generating information, not only for the general public but also for organizations and policymakers (Haris et al., 2021).

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 (Shoaib 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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Current work:

Du Jianguo, Muhammad Asim Shahzad, Muhammad Junaid, **Muhammad Shoaib**, Muhamad Irfan: Unleashing the Nexus Among Green HRM, Employee Well-being, and citizenship behavior in China's Hospitality Sector, Environmental Science and Pollution Research, ABS-3, ABDC-A, Scopus: Q2, Web of Science: SSCI, Current status Under-review.

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Transformation towards Sustainable Performance in the Selected Sectors". Guarantor: doc. Ing. Roman Zámečník, Ph.D.

Awards and Recognition

From 2019 to 2023, the student has been awarded several extraordinary scholarships by the rector of Tomas Bata University in Zlin. These scholarships were given in recognition of the student's outstanding research performance throughout their PhD program. These scholarships were awarded to the student for actively working towards achieving the goals of the IGA project. The IGA project refers to a specific research project or initiative that the student was involved in. The student received these scholarships for publishing the articles in different Journals.

Ad-hoc Reviewer:

Frontiers in Psychology, section Organizational Psychology.
Journal of Environmental Planning and Management
Cogent Business & Management

APPENDICES

Annexure 1: Summary of GHRM -related studies

Authors	Purpose	Major GHRM-related findings	Journal
Darvishmotevali & Altinay (2022)	This research examines the connection between green human resource management, pro-environmental performance of employees, environmental consciousness, and servant leadership.	The results indicate that environmental awareness plays a role in the effects of green human resource management on proactive pro-environmental performance, but it does not have an impact on pro-environmental	Journal of Tourism Management

		performance related to specific tasks.	
Ye, J., Zhang et al (2022)	The aim of this study is to investigate the psychological link between green human resource management and the environmentally conscious actions of new employees, both within and outside of their job responsibilities.	The examination reveals the mediate influence of green human resource management on the environmentally conscious actions of new employees, both in and out of their job responsibilities, as well as the role that the perceptions of being part of the organization and the perception of external prestige play in this relationship.	International Journal of Manpower
Ababneh (2021)	This research applied the classical theory of fit between individuals and organizations to investigate how certain personality traits affect the relationship between human resource management practices and employee involvement in environmental initiatives.	This research highlights the significance of the interaction between the organization and the individual in promoting employee involvement in environmental initiatives.	Journal of Environmental Planning and Management

Khan & Muktar (2021)	This study summarizes past, present, and future efforts in the field of green human resource management, sustainable development and serves as an introduction for researchers who are new to this topic.	The findings showed that Green HRM is still evolving and is a multifaceted concept, with green training as a crucial component. Factors such as teamwork, management support, and a green organizational culture are crucial in promoting sustainable development for both the company and its employees.	International Journal of Sustainable Development and Planning
Abbas, Z., et al (2022)	The purpose of this research is to evaluate the effects of green human resource management practices on sustainability in higher education in a developing country by using the Resource-Based View theory as a framework.	This research expands the knowledge of the growing global trend of green mobility and emphasizes the effect of green human resource management practices on sustainability as perceived by academic professionals.	International Journal of Manpower
Usman & Mat (2021)	This research aims to investigate how green Human Resource Management practices influence environmental performance by conducting a narrative literature review. The study emphasizes the	This research recognizes the significance of identifying key components or elements of green HRM practices in order to enhance environmental performance. Studies of green HRM provide strong	International Journal of Economics, Management and Accounting

	importance of implementing green HRM as a crucial factor in achieving successful environmental performance.	evidence of the positive impact of green HRM on environmental performance. Implementing green HRM can lead to improved environmental performance.	
Bombiak (2020)	The aim of this study is to organize knowledge about sustainable human resource management and to assess the extent of practical implementation of the new HR function model in Polish companies.	Sustainable development is a contemporary concept of societal development that arose from the requirement to reduce and eliminate the negative impacts of economic activity. Its implementation necessitates altering the philosophy of managing organizations by incorporating social and ecological objectives in their strategy.	European Research Studies Journal
Hameed et al. (2020)	Recent studies have shown a growing recognition among the business community of the significance of environmental issues. Green human resource management has become an essential business tactic for	The structural regression analysis showed that Green Human Resource Management has a considerable indirect impact on organizational citizenship behavior for the environment through green employee empowerment. The results	International Journal of Manpower

	companies because the human resource function can play a vital role in promoting environmentally-friendly practices.	also showed that an individual's green values moderate the positive association between green employee empowerment and organizational citizenship behavior for the environment.	
Mousa, S. K., & Othman, M. (2020)	This paper aims to evaluate the extent of adoption in Palestinian healthcare organizations of green human resource management practices and their effect on sustainability performance in this critical service sector.	This research illustrates the recognition and prioritization of green practices, where 'green recruiting' and 'green training and engagement' were the most prominent practices;' green performance monitoring and compensation' was the least effective green practice.	Journal of Cleaner Production
Wantao Yu et al. (2020)	This research evaluates the importance of green human resource management in facilitating environmental collaboration with customers and suppliers, and how internal green supply chain management practices moderate this relationship.	This study suggests that Human Resource Management professionals should establish green HRM practices that provide training, incentives, and conducive environments to facilitate environmental collaboration. Additionally, Supply Chain Management practitioners should improve internal green	International Journal of Production Economics

		SCM to enhance the impact of green HRM practices.	
Çop, S. et al. (2020)	This study reflects on building a deep relational capital inside an organization through the leader's transformative capacity to combat environmental problems.	By assessing green transformational leadership's effect through the mediating role of green job commitment to green teams' resilience. The result assesses that green transformation leadership positively affects green work engagement and the longevity of green teams. The engagement to green work fully impacts the relationship between the variables.	Journal of business strategy and environment
Yusliza. et al. (2020)	This study aimed to establish the link between green intellectual capital and sustainable results. Many studies focus on sustainable development, but this paper provides the first study on green intellectual capital.	For eco-friendly enterprises and organizations, in particular, this analysis's findings would have diverse consequences. This study's uniqueness is green intellectual capital's value to promoting sustainable firms' success and researcher's reputation.	Journal of Cleaner Production
Zaid, A. A., & Jaaron, A. A. (2020)	This article aims to understand Green Human Resources Management (GHRM)	The GHRM bundle made positive contributions in all four dimensions of organizational	International Journal of Scientific &

	's impact on the Palestinian manufacturing sector for fiscal, financial, social, and organizational efficiency.	performance. This research allows the manufacturing sector to determine the required approach for adopting greening HRM practices.	Technology Research
Saqib Yaqoob Malik et al. (2020)	This analysis aims to evaluate the impacts of GHRM practices and green intellectual capital on sustainability through cross-sectional data.	The findings suggest that GHRM practices such as recruiting and placement, and incentives, positively affect an organization's success in sustainability. Green management methods and green awareness have a beneficial impact on successful strategic architecture.	Journal of Sustainability
Singh, S. K. et al. (2020)	This study explores how green human resource management interacts with green leadership in transformation, green creativity, and environmental performance.	This research advances the theory significantly and demonstrates the connection between HRM and performance. It depends neither on the additive influence of, as a backdrop and mediator, green transformational leadership and green innovation, nor on their interactive influence, but on a mixture of mixed types (i.e., additive and interactive) that influence	Journal of Technological Forecasting & Social Change

		firm environmental performance.	
Arqawi, S. et al. (2019)	This paper aims to explore the views and level of acceptance of GHRM practices among manufacturing firms in Palestine.	The outcome revealed that a firm in Palestine had followed GHRM practices to a much greater extent. May apply the results through more research on the problems. Researchers and professionals should extend this outcome to their study and business plans to effectively enhance sustainable performance and incorporate GHRM practices.	Journal of Resources Development and Management
Bag, S., & Gupta, S. (2019)	This research explores the relationship between green human capital for reverse logistics strategy implementation and the remanufacturing activity efficiency.	These results suggest that green human capital has a positive effect on projects of reverse logistics and remanufacturing. Sustainability culture would have a beneficial impact on affordability as well as attract creativity. The supply of green human capital, industrial facilities, and the success of recycling operations have a moderating influence on economic and social stability.	International Journal of Manpower

Ojo & Raman (2019)	Green human resource management involves coordinating the company's human resource management practices with its environmental management system.	The study discusses the outcomes of the research and provides recommendations on how to implement green human resource management practices to encourage employees to adopt pro-environmental information technology behavior.	In World Conference on Information Systems and Technologies
Sinaga & Nawangsari (2019)	The purpose of this research is to examine the impact of green recruitment, green training, and organizational citizenship behavior for the environment on employee performance.	The findings of this study are: 1) Green recruitment, green training, and Organizational Citizenship Behavior for the Environment have a positive and significant impact on employee performance. 2) Green recruitment and green training have a positive and direct impact on employee performance through their effect on Organizational Citizenship Behavior for the Environment.	Dinasti International Journal of Management Science
Saeed et al. (2019)	This study posits that the relationship between board diversity and the quality of corporate social responsibility disclosure in Pakistan	The study found that there is not a universal rule for how diversity on a board supports corporate social responsibility, as the characteristics of different	Corporate Social Responsibility and Environmental Management

	should differ from previous research conducted in other countries.	institutional contexts are unique.	
Chams, N., & García-Blandón, J. (2019)	Sustainable human resource management is one of the disciplines that support "green" organizations (SHRM). The Sustainable Development Goals (SDGs) are accomplished by implementing the organization's human capital of modern ecological approaches and integrating creative, sustainable strategies.	The primary function of SHRM is discussed in this comprehensive literature review. To build a sustainable environment for work and to promote the achievement of SDGs. This analysis identifies the context and findings of SHRM based on a collection of scientific and conceptual papers. It illustrates the challenges to successful adoption, not just at the organization stage but also from an international context.	Journal of Resources, Conservation & Recycling
Yong, J. et al. (2019)	Green human resource management (HRM) has been a critical tool for organizations to shift into a sustainable organization.	Surprisingly, only green human capital and green structural capital have been primarily discussed by human resource experts and managers among three aspects of green intellectual capital. In contrast, green relational capital has hardly been observed in applying green HRM.	Journal of Management Development

Yusoff, Y. M. et al. (2019)	This study focuses on the connection between green intellectual capital and its three facets (green human capital, green structural capital, and green relational capital) and sustainability.	The findings indicate that the green structural capital and green relational capital are correlated with firms' sustainability, while the green human capital is positively associated with sustainability.	Journal of Cleaner Production
Zaid, A. A. et al. (2019)	This study investigates the implementation of GSCM practices and their impact on the performance of organizations.	In particular, this research's effects would be essential for manufacturing firms that seek to increase their organizational performance.	International Journal of Recent Technology and Engineering
Yong, J. Y. et al. (2019)	The relationship between the two was explored in this research. These are green intellectual capital and green human resource management.	There is a close relationship between green human capital and green relational capital that impacts green human resources management. This feature is not positively correlated with green HRM.	Journal of Cleaner Production
Akhtar, P. (2019)	This research examines the factors and impact of GSCM policies on manufacturing firms' economic performance in Pakistan's economy in three sectors (textile, chemical, and pharmaceutical).	The findings indicate that structural stresses are the most potent enablers of competition and the establishment of GSCM programs, while social pressures and competitive pressures also significantly affect. The	Journal of Competitiveness

		effects on business competitiveness and economic results of GSCM interventions were also evaluated and found to be necessary.	
Zaid, A. A. et al. (2018)	This study intends to explore the link between green supply chain management and green human resource management bundle practices (i.e., internal practices and external practices) and their effectiveness on green triple bottom line results (i.e., economic, environmental, social, and performance).	This study suggests that green human resource management and green supply chain management methods significantly impact each other. It can be inferred that green human resource practices significantly affect environmental efficiency.	Journal of Cleaner Production
Zaid, A. A. et al. (2018)	In this article, instead of being an entity, GHRM practices are considered a bundle, offering various benefits.	This paper also lays forth a paradigm of GHRM, which can be used in organizational efficiency. To introduce the GHRM, it will be helpful for a manufacturing firm to find a profitable means for itself.	International Journal of Engineering & Technology
Masri, H. A., & Jaaron, A. A. (2017)	This paper aims to define, prioritize, and verify green human resource management practices that impact	The findings of this analysis show that GHRM practices have a favorable effect on EP. The study also indicated a	Journal of Cleaner Production

	manufacturing organizations' environmental performance.	statistically optimistic and important association between the six green human resource management practices and environmental performance at a significant level ($\alpha \leq 0.05$).	
Mishra (2017)	This research aims to investigate the current state and difficulties of green human resource management in India, which has not been widely studied. Additionally, it presents a theoretical framework to address the identified gaps and establish a sustainable organization.	The results indicate that there is room for improvement in using green human resource management practices to promote pro-environmental behavior within organizations.	International Journal of Organizational Analysis
Tariq et al. (2016)	This study concentrates on combining and organizing literature on how to encourage employees to perform green tasks, as influenced by green employee empowerment.	Human resources are crucial for the success of any organization. A motivated and environmentally conscious workforce can significantly impact the social and financial performance and productivity of an organization.	Qual Quant (Springer)

Jabbour & Jabbour (2016)	Implementing practices of green supply chain management, like green purchasing and collaborating with clients, faces challenges often caused by inadequate training in green practices	The findings revealed that green training has a positive association with the implementation of green supply chain practices in green purchasing and collaboration with clients, supporting the primary hypothesis of the study.	Journal of Cleaner Production
Cheema et al. (2015)	This study delves into the various elements of green HRM and examines the obstacles encountered during the implementation of its practices.	This study examines the factors that affect the adoption of green HR practices, including age, experience, and gender, and their impact on employee performance. The results suggest that these factors have a significant impact on the implementation of green HR practices	Journal of Business Studies Quarterly

(Source: Author own elaboration)

Annexure 2 Questionnaire items

Please select the right option (1, 2, 3, 4, 5, 6 or 7) 1= strongly disagree, 2=Disagree, 3=Slightly disagree, 4=Moderate, 5=Slightly agree, 6=Agree, 7=strongly agree.

Construct/items							
GHRM bundle practice (Green Hiring)							
Our organisation prefers to recruit employees that have knowledge about environment.	**1**	**2**	**3**	**4**	**5**	**6**	**7**

Applicants for jobs in our organisation are subject to interviews to test their knowledge.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
In our organisation addition to other criteria, employees are selected based on environmental standards.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
In general Job seekers are attracted by the environmental image and policies of the organisation.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Our organisation job description includes the job's environmental aspects.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
The recruitment message includes organisations' environmental values in job advertisement.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Green Training and Involvement							
Training programs about environment are provided to large-scale individuals in the organisation.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
In general, staff are satisfied with the organisation's green training.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Topics offered through green training are modern and suitable for the institution's activities.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
The organisation provides formal environmental training programs for employees to increase their ability to promote them.	**1**	**2**	**3**	**4**	**5**	**6**	**7**

Environmental training is a priority and an important investment.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
The need assessment for green training helps to familiarise employees with environmental practices.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Evaluation of green training and development helps to measure the employees' level of green knowledge and awareness.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Environmental objectives contain green training and development aspects.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Green Performance Management and Compensation							
Specific environmental goals are adopted by every manager and employee in the organisation.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
When environmental programs are improved, employees are rewarded for their remarkable ideas.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Employees who have achieved or exceeded the objectives of the environmental institution are rewarded with non-cash equivalents or other cash prizes.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Section managers reward staff in their departments when they improve environmental programs.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Environmental performance is recognized in public.	**1**	**2**	**3**	**4**	**5**	**6**	**7**

One of the criteria employee performance assessment is the achievement of environmental objectives.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
There are adequate assessments of staff performance after attending courses on environmental topics	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Green Human Capital							
The contribution of the environmental protection of employees in our firm is better than our major competitors.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Employee competence concerning environmental protection in our firm is better than that of our major competitors.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
The product and/or service qualities of environmental protection provided by the employees of this firm are better than our major competitors.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
The amount of cooperative teamwork concerning environmental protection in our firm is more than that of our major competitors.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Our managers fully support our employees in achieving their goals concerning environmental protection.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Environmental Performance							
Direct and indirect toxic emissions are reduced in our organisation.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Our organisation increases the volume of recycled materials and reduce waste.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Increase the rate of purchase of environmentally friendly goods (e.g., medicines).	**1**	**2**	**3**	**4**	**5**	**6**	**7**

Increase activities that protect our natural environment such as the presence of green areas in the institution.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Reduced the risk of environmental accidents such as medical waste leakage, poisoning or radiation emissions.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Economic Performance							
We feel that growth in the organisation's profits in general is due to the energy consumption and materials reduction.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
We believe that rise in the market share of the enterprise and improve the reputation of the organisation.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
We have confidence to reduce the cost of energy use.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
We believe that reduce processing fees and waste disposal.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Social Performance							
Our organisation increase attention in the rules of the health and safety of employees, especially when using hazardous materials and radiation.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
We feel that our organisation improving community health and safety, and infection control.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Our organisation developing economic activities in the community and providing more job opportunities.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Our organisation reducing the impact of the organisation's waste on the community.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Our organisation improving the quality of service provided, and commitment to the code of ethics.	**1**	**2**	**3**	**4**	**5**	**6**	**7**

Our organisation develops and design better service and participation of staff initiatives in management decisions.	**1**	**2**	**3**	**4**	**5**	**6**	**7**

Annexure 3 pilot study results

Table Construct Model

Constructs	**Indicator**	**Factor Loadings**	**VIF**
Economic Performance (EP)			
	Ec. P1	0.887	1.314
	Ec. P3	0.836	1.314
Environmental Performance (Ec. P)			
	EP1	0.750	1.458
	EP3	0.822	1.648
	EP4	0.770	1.598
	EP5	0.741	1.388
Social Performance (SP)			
	SP2	0.861	1.140
	SP5	0.778	1.140
Green Human Capital (GHC)			
	GHC1	0.832	1.898
	GHC2	0.877	2.366
	GHC3	0.800	1.807
Green Human Resource Management bundle (GHRM)	GHC4	0.804	1.853
	GH1	0.783	1.970

GH2	0.851	2.380
GH3	0.792	2.001
GH4	0.679	1.720
GH5	0.736	1.617
GH6	0.743	1.624
GTI2	0.850	1.614
GTI3	0.776	1.374
GTI4	0.805	1.493
GPC1	0.757	1.316
GPC3	0.571	1.166
GPC4	0.630	1.220
GPC5	0.783	1.233

Note: VIF= Variance Inflation Factors **Source**: Author own

Table Construct Reliability and Validity

Construct	**Cronbach's Alpha**	**rho_A**	**Composite Reliability**	**Average Variance Extracted (AVE)**
Green human capital	0.848	0.853	0.898	0.687
GHRM bundle		0.898	0.909	0.439
Green Hiring	0.890	0.863	0.894	0.587
Green training and	0.858	0.743	0.852	0.658
involvement	0.739	0.683	0.782	0.477
Green PMC	0.642			
Environmental		0.779	0.854	0.595
Performance		0.670	0.853	0.743
Economic Performance	0.773	0.534	0.805	0.674
Social Performance	0.657			
	0.519			

Author processing from SmartPLS 3.0. **Source**: Author own

Table Fornell-Larcker Discriminant Validity

Variable	Ec. P	EP	GH	GHC	GHRM	GPC	GTI	SP
Ec. P	0.862							
EP	0.899	0.771						
GH	0.532	0.543	0.766					
GHC	0.581	0.624	0.571	0.829				
GHRM	0.663	0.705	0.900	0.739	0.662			
GPC	0.530	0.560	0.546	0.765	0.754	0.691		
GTI	0.634	0.689	0.670	0.648	0.889	0.654	0.811	
SP	0.556	0.755	0.504	0.451	0.623	0.462	0.600	0.821

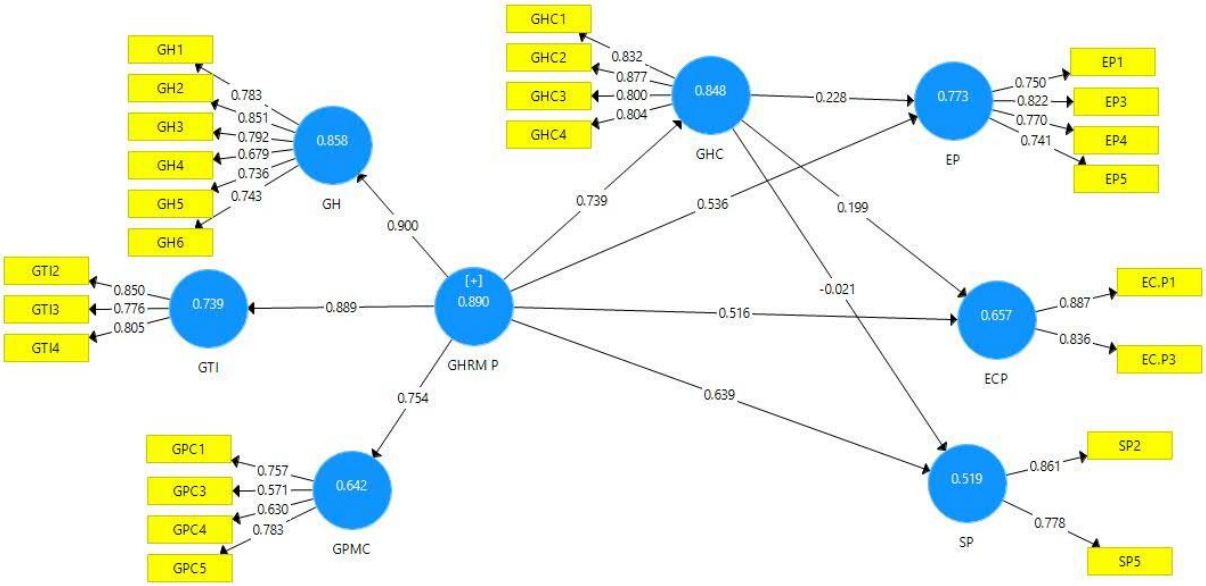
Square roots of average variance extracted (AVE's) shown on the diagonal source: Author estimations from SmartPLS 3.0 **Source:** Author own

Table. Path Coefficient: Direct and Indirect relationship

Relationship	Coefficient (β)	Sample Mean	Standard Error	t-value	p-values	Empirical remarks
Direct Effect						
GHRM bundle--> GHC	0.739	0.746	0.061	12.118	0.000	Supported
GHRM bundle--> EP	0.536					Supported
GHRM bundle-->Ec. P	0.516	0.523	0.135	3.974	0.000	Supported
GHRM bundle-->SP	0.639	0.509	0.108	4.774	0.000	Supported
GHC-->EP	0.228	0.638	0.127	5.018	0.000	NotSupported
GHC--> Ec. P	0.199	0.255	0.146	1.557	0.120	NotSupported
GHC--> SP	-0.021	0.216	0.125	1.589	0.113	NotSupported
		-0.011	0.159	0.134	0.894	
Indirect Effect						
GHRM bundle-->GHC -->EP	0.168	0.194	0.121	1.390	0.165	NotSupported
GHRM bundle-->GHC --> Ec. P	0.147	0.164	0.102	1.444	0.149	NotSupported
GHRM bundle-->GHC -->SP	-0.016	-0.007	0.122	0.129	0.898	NotSupported
Construct	Coefficient of Determination (R2)					

Green Human Capital (GHC)	0.848
Environmental Performance	0.773
Economic Performance	0.657
Social Performance	0.519

Goodness of Fit	Value
SRMR	0.121



Path Analysis Model (Extracted from SmartPLS 3.0) ***Source****: Author own*

Muhammad Shoaib

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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