GREEN HUMAN RESOURCE MANAGEMENT PRACTICES AND ENVIRONMENTAL SUSTAINABILITY OF SELECTED MANUFACTURING FIRMS IN TEMA METROPOLIS, GHANA: THE MEDIATING ROLE OF GREEN EMPLOYEE BEHAVIOUR

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Abstract

Awareness on environmental sustainability has witnessed astronomical growth, especially due the quest for economic gains, which caused considerable damage to the environment. Today, there is a strong preference for organisations that adopt eco-friendly processes and products over those using conventional methods. This study took a departure from previous investigations as it examined the mediating role of green employee behaviour as an essential mechanism for environmental sustainability. Based on the aforesaid, this study investigated green human resource management (GHRM) and environmental sustainability. The study was anchored on the Ability motivation opportunity (AMO), Resource-based view (RBV) theory and stakeholder theory. A quantitative methodology was used, with data collected from three hundred and thirty two (332) employees of selected manufacturing organisations in Tema Metropolis using the convenience non-probability sampling technique. The study employed PLS SEM (Partial least square structural equation modelling) technique to examine the relationship between variables. Results indicated that all variables have positive and significant influence on environmental sustainability as their p values were below or equal to 0.05 except for green compensation and benefits and green recruitment and selection on green employee behavior whose p values were above 0.05. Specifically, we concluded that GHRM practices remains a critical factor in achieving environmental sustainability and contributes to success of sustainable development agenda of manufacturing organisations. Therefore, manufacturing organisations should prioritize integrating environmental goals into their core business strategies, ensuring that sustainability is not just a side initiative but a fundamental aspect of their operations.

Keywords: *Environmental Sustainability, Ghana, GHRM Practices, Green Employee Behaviour and Manufacturing Firms.*

INTRODUCTION

Awareness of environmental sustainability has grown significantly, especially following the industrial revolution, which caused considerable environmental damage (Sun, 2019). Today, there is a strong preference for organisations to adopt eco-friendly processes and products over those using conventional methods. Sustainability is now recognized as development that meets present needs while considering the requirements of future generations (Shafique et al., 2021). It is imperative that every staff member takes individual responsibility for supervising the environment, as their work performance significantly impacts the company's green practices. This encourages cooperation between management and staff towards achieving a unified vision (Masri et al., 2017). Green Human Resource Management (GHRM) is a strategic approach that integrates environmental management concepts and sustainable human resource practices. GHRM aligns environmental goals with organisational objectives, emphasizing the importance of environmental sustainability.

Renwick et al. developed a theoretical framework for GHRM based on the Ability-Motivation-Opportunity (AMO) hypothesis, which encompasses recruitment, training, supervision, compensation, and social development (Yong et al., 2021). GHRM covers various aspects such as green health and safety, labor relations, job analysis, recruitment, training, performance management, and employee involvement. Despite the significance of GHRM, research on its relationship with sustainability remains limited and inconsistent. While some studies show a positive relationship between green management practices and sustainability, others find no significant correlation.

Green HRM initiatives are crucial for enterprises aiming to reduce environmental impact and promote sustainability. However, these initiatives are still in their early stages, and more empirical studies are needed, especially in contrasting contexts such as emerging economies versus industrialized nations. Existing research indicates a link between green HRM and positive organisational outcomes, such as improved employee attitudes and behaviors, lower turnover rates, and enhanced organisational identification. Overall, GHRM plays a vital role in promoting environmental sustainability and should be a key focus for organisations seeking to become more sustainable.

This study addresses the impact of Green human resource management (GHRM) practices such as green recruitment and selection, green training and development, green performance and management and green compensation and benefits on environmental sustainability. As there is a dearth of research and literature on the relationship between Green human resource management practices on environmental sustainability in the Ghanaian manufacturing industry, this study filled this clear research gap. Moreover, the finding of this study provides the need of green employee behavior which helps in organisational sustainability (Muster & Schrader, 2011).

Organisations are the primary stakeholders implementing Green HRM practices, such as green recruitment, training, and performance management, to achieve environmental sustainability. They benefit from reduced costs, increased productivity, and enhanced sustainability. HR Professionals and Managers are stakeholders and are responsible for implementing Green HRM practices. They play a key role in recruiting, training, and managing employees to align with sustainability goals. Many scholars suggested that the green recruitment and selection and green performance and development enhances the environmental sustainability by producing things that are ecological, reusable, recycled so that sustainability be achieved (Roscoe et al., 2019; Haldorai et al., 2022). Sustainable performances and recruitment reduce the cost and time incurred at training and hiring of employees which helps in environmental sustainability (Tang et al., 2018).

Green HRM practices may results in increase revenues, reduced expenses, reduce wastes, water, material, energy and other natural resources in organisation (Yong et al., 2020). The organisation should increase employee's productivity, reduce cost of hiring and training, and promotes green employee behavior and performance as organisation hires employees that have sense of social responsibility and exhibit sustainable organisational performance and policies. This study also filled the gap by addressing how the mediating role of green employee behaviour is essential for environmental sustainability among the selected manufacturing firms in Tema Metropolis, Ghana.

The generic objective of this study aimed at interrogating GHRM and environmental sustainability of selected manufacturing firms in Tema Metropolis, Ghana with the mediating role of green employee behaviour. Specifically, the study aimed at:

i. examining the effects of green recruitment and selection (GRS) on environmental sustainability (ES);
ii. investigating the influence of green training and development (GTD) on environmental sustainability (ES);
iii. assessing the effects of green performance and management (GPM) on environmental sustainability (ES);
iv. interrogating the effect of green compensation and benefits (GCB) on environmental sustainability (ES);
v. examine the mediating role of green employee behaviour (GEB) on the relationship between green recruitment and selection (GRS) and environmental sustainability (ES);
vi. assessing the mediating role of green employee behaviour (GEB) on the relationship between green training and development (GTD) and environmental sustainability (ES);
vii. ascertaining the mediating role of green employee behaviour (GEB) on the relationship between green performance and management (GPM) and environmental sustainability (ES); and

viii. investigating the mediating role of green employee behaviour (GEB) on the relationship between Green Compensation and Benefits (GCB) and Environmental Sustainability (ES).

Hypotheses Development

The following hypotheses were developed in the study.

Hypothesis 1 (H1): Green Recruitment and Selection (GRS) positively affects Environmental Sustainability (ES).

Hypothesis 2 (H2): Green training and development (GTD) positively influences Environmental sustainability (ES).

Hypothesis 3 (H3): Green performance and management (GPM) positively influences Environmental sustainability (ES).

Hypothesis 4 (H4): Green compensation and benefits (GCB) positively influences Environmental sustainability (ES).

Hypothesis 5a (H5a): The Green Employee Behavior (GEB) mediates the relationship between Green Recruitment and Selection (GRS) and Environmental Sustainability (ES).

Hypothesis 5b (H5b): The Green Employee Behavior (GEB) mediates the relationship between Green Training and Development (GTD) and Environmental Sustainability (ES).

Hypothesis 5c (H5c): The Green Employee Behavior (GEB) mediates the relationship between Green Performance and Management (GPM) and Environmental Sustainability (ES).

Hypothesis 5d (H5d): The Green Employee Behavior (GEB) mediates the relationship between Green Compensation and Benefits (GCB) and Environmental Sustainability (ES).

LITERATURE REVIEW

This section of the study provided lucid explanations on the constructs that made up the study.

Green Recruitment and Selection

Green recruitment positively impacts environmental sustainability. (Roscoe et al., 2019), organisations that incorporate environmental considerations into their recruitment processes are more likely to hire individuals who exhibit pro-environmental behaviors and values. These employees are more likely to engage in sustainable practices, contribute to the organisation's green goals, and promote a culture of sustainability within the organisation. (Castellano, Punzo, Scandurra & Thomas, 2022). Green recruitment processes are essential for attracting talent that values environmental sustainability. These employees not only fit well within the organisational culture but also drive sustainability initiatives forward, leading to better overall environmental performance. (Renwick, 2013), green recruitment helps organisations reduce costs associated with turnover and training.

Employees hired through green recruitment processes are more likely to align with the organisation's environmental values, leading to higher job satisfaction and lower turnover rates. This alignment reduces the costs and resources required for frequent hiring and training, thereby contributing to environmental sustainability. (Haider, Ali, Jamshed, Ryu & Gill, 2021). Green recruitment can enhance the organisation's reputation, making it more attractive to both customers and potential employees who value sustainability. This improved reputation can lead to increased market share and better financial performance, thereby supporting long-term sustainability goals. Pekovic & Bouziri, 2023).

Green Training and Development

Green training refers to the educational programs and initiatives designed to enhance employees' knowledge, skills, and attitudes towards environmental sustainability (Pekovic & Bouziri, 2023). These programs aim to instill a deep understanding of sustainable practices and encourage employees to integrate these practices into their daily work activities. Green Training significantly contributes to environmental sustainability by helping employees to understand the importance of sustainability and equip them with the skills needed to implement green practices effectively (Pekovic & Bouziri, 2023).

Green training is crucial for embedding sustainability into the organisational culture. By providing employees with ongoing training on environmental issues, organisations can ensure that sustainable practices are consistently applied across all levels and functions. According to Nasir, et al, (2021); Song

et al, 2017; Zheng et al, (2020) green training enhances employees' motivation and commitment to sustainability (Zhang & Walton, 2017). Training can lead to innovation in sustainable practices, as employees become more aware of and adept at identifying and implementing eco-friendly solutions. This innovation is critical for long-term sustainability and maintaining a competitive (Edge et al., 2018).

Green Performance and Management

Effective green performance management practices can significantly impact environmental sustainability by ensuring that employees are aligned with the company's environmental objectives and are motivated to engage in sustainable behaviors (Chaudhary, 2019). Green performance management practices such as setting environmentally focused performance goals, providing regular feedback on environmental performance, and recognizing and rewarding employees' sustainable behaviors can lead to improved organisational sustainability goals (Appelbaum & Gallagher, 2000). When employees are assessed and rewarded based on their environmental performance, they are more likely to adopt and maintain behaviors that support sustainability. This alignment of individual performance with organisational environmental goals enhances overall sustainability outcomes (Daily & Huang, 2001; Renwick et al., 2013).

Green Compensation and Benefits

Green Performance practices, such as bonuses for achieving environmental targets, benefits for participation in green initiatives, and rewards for innovative sustainable practices, can motivate employees to contribute to the organisation's sustainability goals (Jabbour & Santos, 2008). When employees see a direct link between their environmental efforts and their financial rewards, they are more likely to prioritize and enhance their sustainable behaviors. This can lead to significant improvements in environmental sustainability by reducing waste, conserving resources, and promoting eco-friendly practices (Yong et al., 2020; Jabbour & Santos, 2008). By linking compensation to environmental performance, organisations can motivate employees to prioritize and actively engage in sustainable practices. (Jackson et al., 2011; Renwick et al., 2013).

Mediating Role of Green Employee Behavior (GEB)

Assessing employee environmental performance is crucial in HRM. Resource-based theory (RBV) highlights how firms can gain a competitive advantage by utilizing their resources effectively. An organisation's information-based philosophy emphasises expertise as its most valuable resource. Integrating environmental objectives into strategic development goals is possible with effective environmental management (EM) according to (Zhang & Walton, 2017). GHRM positively impacts company performance and competitive advantages. Modern HR methods and new environmental management (EM) should be explored to improve long-term sustainability and competitiveness. Employing new employees who showcase good green behaviors using the green recruitment and selection (GRS) process may eventually convert to GEB.

Green Training and Development (GTD) can lead to innovation in sustainable practices, as employees become more aware of and adept at identifying and implementing eco-friendly solutions (Saeed et al., 2019). This innovation is critical for long-term sustainability and maintaining a competitive Edge. Green employee behavior (GEB) is linked to organisational citizenship behavior and negatively related to counterproductive work behavior. Motivating green employee behaviors (GEB) requires careful selection of environmentally conscious personnel and pro-environmental incentives, green performance and management (GPM), and training (Renwick et al., 2013). Organisations must include environmental management contributions among their evaluation criteria to assess performance management effectively.

Theoretical Framework

The theoretical framework for this study was anchored on was based on the Resource-based view (RBV) theory, Ability motivation opportunity (AMO) and stakeholder theory respectively.

Resource-based view (RBV) Theory

The research- based view is a theory in strategic management that focuses on firms' or organisation's internal resources as the key to achieving a sustainable competitive advantage. This theoretical lens explains and helps how an organisation's green human resources management (GHRM) and sustainable capabilities work to improve the environment and social performance of the firm (Wright and McMahan 1992). Many HR theorists employed a research-based view (RBV) to know the effects of Human Resource Management (HRM) on organisational performance (Delaney and Huselid 1996). Research-based view (RBV) emphasizes that a firm's resources and capabilities are the foundation for its success. These resources can be tangible (like machinery, buildings and products etc.) or intangible (like brand reputation) but human resources and intellectual capital are the most important among these assets. These resources give organisations a competitive advantage over others (Barney 2001). Organisations that are extending their products and services line, value chain and principles focused on the environmentally friendly and ecological balance systems, these are the factors which are responsible for achieving sustainability (Chiappetta Jabbour et al. 2017).

Ability motivation opportunity (AMO) Theory

Ability motivation theory (AMO) has been established by Renwick. And primarily focuses on how the motivation of the workforce, the performance of employees and the productivity of the organisation be increased through the implementation of green human resource management (GHRM) practices which then lead to environmental sustainability. (Renwick et al. 2013). The stakeholder theory is a prominent concept in business ethics and organisational management. It states that firms have various responsibilities to stakeholders. A stakeholder is a person who has a stake in a business and can be affected directly or indirectly by firm issues (Werhane and Painter-Morland 2011). Stakeholders include not only shareholders but also employees, customers, suppliers, communities, and other entities affected by the actions of the business (Donaldson and Preston 1995).

Stakeholder Theory

Stakeholder theory offers a valuable framework for businesses to consider the broader social and environmental context of their operations. By balancing stakeholder interests, organisations can achieve sustainable success and contribute positively to society. (Ramasamy et al. 2017). The theory argues that by taking into account the needs and concerns of all stakeholders, a business can create long-term sustainable value and can foster positive relationships with its broader ecosystem and can achieve organisational sustainability (Rehman et al. 2022). According to Tseng et al. (2013), to raise workers' desire to adopt and enhance pro- environmental attitudes and behaviors, positions should be created to motivate or encourage employees to be concerned about the environment and their surroundings and report on environmental management that contributes to organisational sustainability goals. HRM's primary duty is to mold workers' attitudes and actions to achieve the company's overall green strategy. Representatives participate in and get recognized for innovative environmental performance and an organisation's efforts also the organisation should give green training to employees to inform employees about the sustainable organisational goals. Green HRM influences pro-environmental workplace attitudes among representatives inside the company so that environmental sustainability be achieved (Chaudhary 2019).

Conceptual Framework
Conceptual Framework

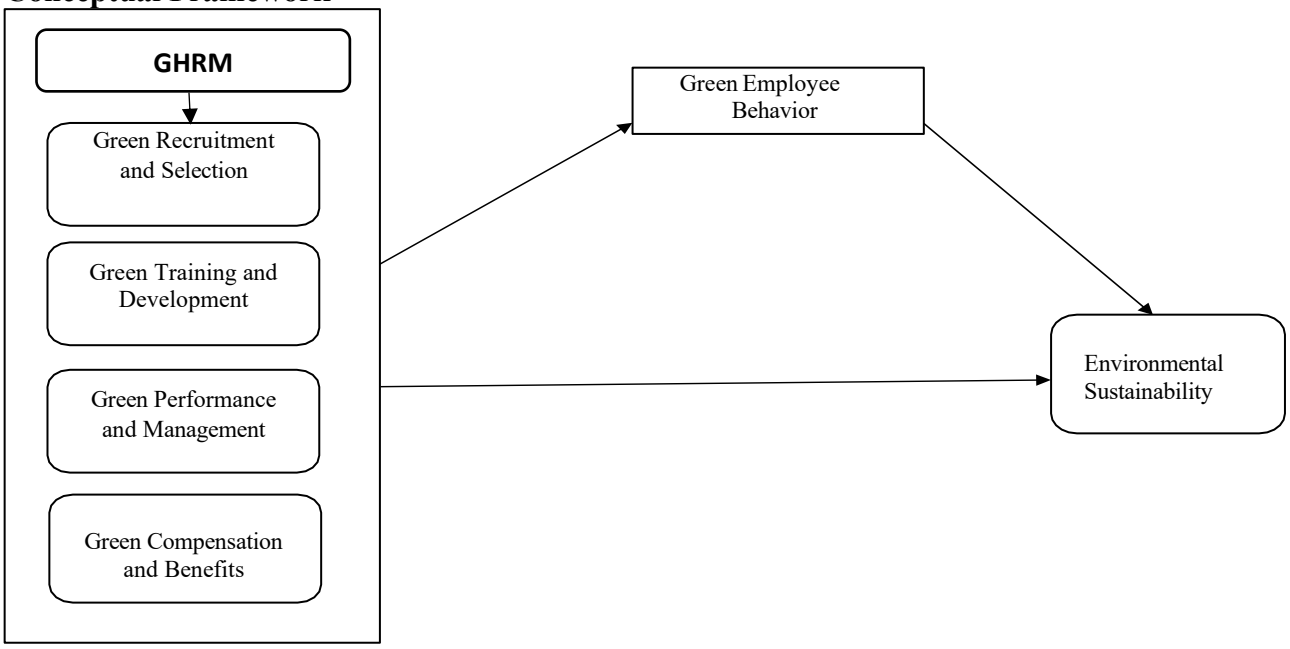

Fig 1.1: Conceptual model explaining the independent, dependent and the mediating variables of the study.
Source: Researchers Schematic Model, (2025)

METHODOLOGY

This section of the study provided a systematic plan on the procedures for which data were collected as well as the various techniques used, and the rationales behind their usage.

This study explored the relationships between the variables using a correlational research design. In this context, the independent variables were Green Human Resource Management (GHRM) practices, including Green Recruitment and Selection (GRS), Green Training and Development (GTD), Green Performance and Management (GPM), and Green Compensation and Benefits (GCB). The dependent variable is Environmental Sustainability (ES). Green Employee Behavior (GEB) functions as a mediating variable, examining how it influences the relationship between GHRM practices and ES. A correlational design was employed to understand the connections between these variables without manipulating them, allowing for insights into how GHRM practices may influence environmental sustainability through GEB. This approach helped in identifying potential patterns and relationships based on existing data, providing a framework for predicting future outcomes.

This study used the quantitative approach. It allowed us to measure the variables and explain the connections between them. Investigating the link between independent and dependent variables was the goal of the study. The deductive approach was also opted because it represents a method in which you move from a general specification or observation to a specific conclusion and principles.
As obtained from the HR desk of the selected manufacturing firms, the population for this study was valued to be two thousand four hundred and twenty-three (2,423). The comprised employees from diverse cadres ranging from junior to management employees of the selected organisations in Tema Metropolis, Ghana.

Table I: List of manufacturing firms used in the study

S/N	Manufacturing Firms	Population
1.	AVS Industries Limited	36
2.	Berra Manufacturing Company Limited	20
3.	Cargill	240

4	Chocomac Ghana Limited	31
5.	Delta Agro Limited	240
6.	DH Industries Limited	320
7.	Irani Brothers Mills	258
8.	Mass Industries Limited	62
9.	Nutri Food Ghana Limited	600
10.	OXY Industries Limited	16
11.	Sentuo Steel Limited	600
	Total	2,423

Source: Fieldwork, (2025)

Based on the population of the study, a sample size of three hundred and thirty-two (332) was derived for our study through the Krejcie and Morgan (1970) sampling determination table. This was obtained at 95% confidence level and 0.05 rate of error. In this study, we used the convenience non-probabilistic sampling technique, as it enabled us conveniently collect our data.

In determining the sampling frame for the study, the probability proportional to seize measure was used. This allowed the researchers to administer the study instrument in direct proportion to the population of each of the firms.

We distributed close-ended questionnaires among employee of the selected manufacturing firms. Items for GHRM practices were adopted from the study by Tang et al., (2018). We distributed several questionnaires to various organisations including both services manufacturing firms to learn about Green HRM practices and to know what employees and HR thought about increasing GHRM practices for environmental sustainability and how green employee behavior should benefit. We collected data from different age groups varying from 20 -50. This study didn't discriminate between men and women respondents during data collection.

The data are collected by means of a questionnaire which was based on a 5-point Likert scale from strongly disagree (1) to strongly agree (5). Items for GHRM are adopted from the study by (Tang et al., 2018). In this study, SPSS, SmartPLS, and SEM are employed to analyze the impact of Green Human Resource Management (GHRM) practices and Dynamic Sustainable Capabilities (DSC) on Corporate Sustainable Performance (CSP). SPSS is used for descriptive analysis, while SEM investigates relationships among variables.

Convergent validity measures to what degree a several varieties of single concept agree with one another. This measurement is done by factor loading. In this study we look at the impact of Green Human Resource Management (GHRM) practices and mediating role of green employee behavior (GEB) on environmental Sustainability (ES) in both the service manufacturing sector. Convergent validity is ensured by meeting several criteria. Each item's loading must exceed 0.5 (Hair et al., 2014) and constructs are considered reliable with a Cronbach's alpha of 0.7 or higher (Nunnally, 1967). Additionally, the Average Variance Extracted (AVE) should be 0.5 or higher, and Composite Reliability (CR) should be 0.7 or greater (Fornelli & Larker, 1981; Gefen et al., 2000). These measures confirm the reliability and validity of the constructs used in this study.

Validity was evaluated through two key metrics Average Variance Extracted (AVE) and outer loading (or factor loading). For a measure to be deemed valid, the AVE should be higher than 0.5 (50%), and the outer loading should be greater than 0.7 (70%). All variables have significant acceptable Average Variance Extracted (AVE) and outer loading (or factor loading) except green Recruitment and selection (GRS) as its AVE is less than 0.5 and its factor loading is also less than 0.7 which means that this variable is not valid or reliable. The values for AVE and factor loading in this context are as follows:

VARIABLE	ITEMS	Factor loadings	Average variance extracted (AVE)
Environmental Sustainability	ES 1	0.882	0.796
	ES 2	0.879	
	ES 3	0.878	
	ES 4	0.929	
Green Compensation and Benefits	GCB 1	0.814	0.730
	GCB 2	0.915	
	GCB 3	0.860	
	GCB 4	0.826	
Green Employee behavior	GEB 1	0.863	0.796
	GEB 2	0.922	
	GEB 3	0.912	
	GEB 4	0.871	
Green Performance and Management	GPM 1	0.915	0.811
	GPM 2	0.893	
	GPM 3	0.897	
	GPM 4	0.898	
Green Recruitment and Selection	GRS 1	0.514	0.753
	GRS 2	0.659	
	GRS 3	0.606	
	GRS 4	0.865	
Green Training and Development	GTD 1	0.862	0.707
	GTD 2	0.846	
	GTD 3	0.856	
	GTD 4	0.796	

Source: SPSS, (2025)

Discriminant validity

In our investigation into Green Human Resource Management (GHRM) practices and mediating role of green employee, behavior (GEB) on environmental Sustainability (ES) in both the service and the manufacturing sector, ensuring the distinctiveness of constructs is crucial. By adhering to Fornell and Larcker's (1981) criterion of diagonal elements surpassing non-diagonal ones, along with Hair et al.'s (2014) guideline of cross-loading coefficients exceeding 0.5, we confirm Discriminant validity. Additionally, Heseler et al.'s (2015) suggestion of an HTMT coefficient below 0.8 further strengthens the validity of our analysis. These rigorous standards ensure the accuracy of our examination into the relationships between GHRM practices on environmental Sustainability.

Blindfolding and R Square

The significance of the model's predictive relevance is assessed through blindfolding, evaluating the reliability of the framework's forecasts. Blindfolding involves withholding portions of the data to measure the model's ability to predict outcomes based on Green Human Resource Management (GHRM) practices and mediating role of green employee behavior (GEB) on environmental Sustainability (ES). Additionally, according to Nakagawa et al. (2017), the interpretation was measured by the coefficient of determination, or R-square. An R-square valued between 0.25 to 0.50 suggested a mild influence, 0.50 to 0.75 indicates an average impact, and above 0.75 reflects a high impact (Hair et al., 2011).

Statistical Techniques

In this study, SPSS, SmartPLS, and Structural Equation Modeling (SEM) were employed in analysing the data obtained. SPSS was used for the descriptive analysis of demographic data, providing insights into the sample characteristics. SEM, based on regression, was utilized to investigate the correlations between green human resource management (GHRM) practices and environmental sustainability (ES). In addressing the complexity among multiple variables, the Partial Least Squares (PLS) approach was chosen. This approach allows for the estimation of relationships among the constructs and is particularly useful in handling complex models with several predictors and outcomes.

RESULTS AND DISCUSSION

Path coefficient

Path coefficients, indicative of significant relationships, reveal the direct impact of Green Human Resource Management practices and Dynamic Sustainable Capabilities on Corporate Sustainable Performance in the manufacturing sector, with a P value below 0.05 denoting substantive influence (Hair et al., 2014).

Data Analysis

To determine how effectively a model describes particular variables of relevance in a research study, PLS SEM looked into the relationship between variables. Additionally, SMART PLS 3 was used in this study to assess the correlation between the research variables. It demonstrated how variables are interdependent in a transparent manner. However, it also clarified the significance of each and every variable throughout the entire model.

Ethical Consideration

Our study used the information gathered via surveys to investigate sustainable and ethical HR practices. As a result, we place a high value on ethics and give participants' reality and rights top priority. In keeping with the research of Green HRM, we obtain informed consent from all parties involved and save the privacy and confidentiality of the data gathered. Our dedication to conducting ethical research protects the confidentiality and confidence of our subjects while cultivating an open and accountable culture inside our research.

Discriminant Validity

The discriminant validity of the constructs was evaluated using the Fornell-Larcker criterion, as shown in the table. Discriminant validity is established when the square root of the Average Variance Extracted (AVE) for each construct, which is greater than its correlations with other constructs (off-diagonal values). This ensures that each construct shares more variance with its own indicators than with those of other constructs. For Environmental Sustainability, the square root of the AVE is 0.892, which is higher than its correlations with all other constructs, except for Green Employee Behavior, where the correlation is 0.866. This suggests a potential issue with discriminant validity between Environmental Sustainability and Green Employee Behavior, indicating that these constructs may not be entirely distinct from each other.

Fornell-Larcker criterion

Fornell-Larcker criterion						
	Environmental Sustainability	**Green Compensation and Benefits**	**Green Employee Behavior**	**Green Performance and Management**	**Green Recruitment and Selection**	**Green Training and Development**
Environmental Sustainability	0.892					
Green Compensation and Benefits	0.772	0.855				
Green Employee Behavior	0.866	0.849	0.892			
Green Performance and Management	0.785	0.825	0.813	0.901		

Green Recruitment and Selection	0.284	0.363	0.348	0.358	0.673	
Green Training and Development	0.717	0.746	0.732	0.758	0.387	0.841

Loading or cross loading

The outer loadings for the Green HRM constructs reflect strong relationships between the indicators and their respective constructs. For Environmental Sustainability, the loadings are high, ranging from 0.878 to 0.929, indicating that these indicators are highly representative of the construct. Green Compensation and Benefits indicators show robust loadings between 0.814 and 0.915, demonstrating a strong correlation with the construct. Green Employee Behavior indicators range from 0.863 to 0.922, reflecting a solid link. Green Performance and Management indicators exhibit strong loadings, from 0.893 to 0.915. Green Recruitment and Selection shows more variability, with loadings between 0.514 and 0.865, suggesting some inconsistency but a meaningful relationship. Green Training and Development indicators range from 0.796 to 0.862, indicating generally strong associations with the construct. Cross- loadings would need to be examined to ensure indicators are not loading highly on unintended constructs, but the provided loadings suggest good construct validity overall.

Cross Loadings

	ES	**GCB**	**GEB**	**GPM**	**GRS**	**GTD**
ES 1	0.882	0.706	0.808	0.699	0.258	0.646
ES 2	0.879	0.667	0.708	0.669	0.255	0.555
ES 3	0.878	0.669	0.730	0.702	0.263	0.665
ES 4	0.929	0.711	0.833	0.731	0.239	0.686
GCB 1	0.634	0.814	0.655	0.697	0.297	0.617
GCB 2	0.705	0.915	0.758	0.754	0.287	0.653
GCB 3	0.628	0.860	0.712	0.659	0.294	0.675
GCB 4	0.668	0.826	0.768	0.706	0.360	0.605
GEB 1	0.732	0.747	0.863	0.706	0.349	0.695
GEB 2	0.773	0.742	0.922	0.739	0.344	0.690
GEB 3	0.834	0.819	0.912	0.759	0.250	0.639
GEB 4	0.746	0.716	0.871	0.694	0.303	0.591
GPM 1	0.706	0.723	0.726	0.915	0.323	0.704
GPM 2	0.670	0.712	0.689	0.893	0.288	0.642
GPM 3	0.744	0.782	0.785	0.897	0.296	0.705
GPM 4	0.705	0.751	0.722	0.898	0.383	0.678
GRS 1	0.069	0.054	0.069	0.060	0.514	0.016
GRS 2	0.070	0.110	0.100	0.133	0.659	0.089
GRS 3	0.114	0.109	0.131	0.143	0.606	0.069
GRS 4	0.310	0.410	0.383	0.385	0.865	0.469
GTD 1	0.585	0.628	0.620	0.617	0.319	0.862
GTD 2	0.579	0.541	0.589	0.546	0.329	0.846
GTD 3	0.686	0.679	0.665	0.688	0.307	0.856
GTD 4	0.548	0.654	0.582	0.696	0.350	0.796

Heterotrait- monotrait ratio (HTMT)

The table you are examining is a Heterotrait-Monotrait (HTMT) ratio matrix, which is used to verify whether various green practices within an organisation are distinctly measured. From the table, we

observe that certain practices related to environmental sustainability, compensation and benefits, and employee behavior are closely intertwined, as indicated by high HTMT values such as 0.861, 0.942, and 0.945. These high values suggest that these areas might overlap in what they are intended to measure, indicating a need for further refinement to ensure they capture unique aspects. The green recruitment and selection practices show much lower HTMT values (0.231, 0.284, 0.278, 0.294), suggesting these practices are more distinct and effectively measured as separate categories. Generally, HTMT values below 0.90 are preferable as they indicate good discriminant validity, confirming that the categories are distinct. This insight is crucial for both academic research and practical implementation of green initiatives within organisations.

Construct reliability and validity

The table presents information on construct validity and reliability for a study on environmental sustainability in the workplace. The average variance extracted (AVE), Cronbach's alpha, composite reliability (Rho a and Rho c), and other metrics are included for a variety of green HR strategies, such as environmental sustainability, green compensation and benefits, and others. Cronbach's alpha values, which evaluate the internal consistency of the scales, show that most constructs have excellent reliability, with "Environmental Sustainability" and "Green Performance and Management" showing the highest levels of reliability at both beyond 0.9. The findings are further supported by composite reliability measures (Rho a and Rho c), indicating the consistency and dependability of the measuring scales. The AVE values are a way to compare the variance a concept captures to the variance caused by measurement error. All things examined, the data points to strong support for the validity and dependability of the constructs employed to evaluate green HR practices within the framework of organisational sustainability initiatives.

Construct reliability and validity

Construct reliability and validity				
	Cronbach Alpha	**Composite reliability (rho_a)**	**Composite reliability (rho_c)**	**Average variance extracted (AVE)**
Environmental Sustainability	0.915	0.918	0.940	0.796
Green Compensation and Benefits	0.876	0.879	0.915	0.730
Green Employee Behavior	0.914	0.917	0.940	0.796
Green Performance and Management	0.922	0.924	0.945	0.811
Green Recruitment and Selection	0.737	1.007	0.762	0.453
Green Training and Development	0.861	0.866	0.906	0.707

Path Coefficient

Path coefficients are used to tell us that whether the data is reliable and whether the variables have significant impact or not. The standard p value is 0.05. If the variables have p value less or equal to 0.05, we assume that the variables are reliable and have significant impact (Hair et al., 2011). As per the results of above analysis and the chart below, all of the above variables have positive and significant impact on environmental sustainability as their p value is below or equal to 0.05. except green compensation and benefits on environmental sustainability and green recruitment and selection on green employee behavior as their p values are above 0.05 which shows us that these variables have no significant impact.

Path Coefficient

Variables	**Original sample (O)**	**Sample mean (M)**	**Standard deviation (STDEV)**	**T statistics (|O/STDEV|)**	**P values**
Green Compensation and Benefits -> Environmental Sustainability	-0.004	-0.004	0.09	0.049	**0.961**
Green Compensation and Benefits -> Green Employee Behavior	0.508	0.507	0.079	6.452	**0.000**

Green Employee Behavior -> Environmental Sustainability	0.638	0.638	0.09	7.054	**0.000**
Green Performance and Management -> Environmental Sustainability	0.193	0.194	0.087	2.213	**0.027**
Green Performance and Management -> Green Employee Behavior	0.294	0.294	0.075	3.951	**0.000**
Green Recruitment and Selection -> Environmental Sustainability	-0.055	-0.052	0.028	2.005	**0.045**
Green Recruitment and Selection -> Green Employee Behavior	0.009	0.014	0.033	0.278	**0.781**
Green Training and Development -> Environmental Sustainability	0.128	0.126	0.059	2.155	0.031
Green Training and Development -> Green Employee Behavior	0.126	0.125	0.066	1.922	0.055

R-Square and R-Square Adjusted

R-square tells us about the goodness of fit of model. As it measures the strength of the relationship between variables. R-square valued between 0.50-0.99 is considered to be acceptable as most of the variables have positive significant relationship. The table below shows that Environmental Sustainability and Green Employee Behavior are statistically significant variables.

R-Square

Variables	R-Square	R Square Adjusted
Environmental Sustainability	0.776	0.776
Green Employee behavior	0.766	0.766

Discussion of Findings

According to the results, in first hypothesis it is claimed that (Green Compensation and Benefits -> Environmental Sustainability) the sample mean is -0.004 with a high p-value of 0.961, indicating that the direct relationship between green compensation and benefits and environmental sustainability is not statistically significant. This suggests that merely enhancing compensation and benefits with a green focus does not directly influence environmental sustainability outcomes in the studied sample.

The results support the hypothesis that Green Training and Development (GTD) positively impacts Environmental Sustainability (ES). The path coefficient for GTD to ES is 0.128 with a p-value of 0.031, which is below the acceptable threshold of 0.05, indicating a statistically significant relationship. This suggests that training programs focused on enhancing employees' green skills and awareness contribute significantly to achieving environmental goals. Previous studies also align with these findings, emphasizing the role of continuous environmental education and skill development in fostering a culture of sustainability within organisations

Green Performance and Management (GPM) practices significantly impact Environmental Sustainability (ES), as evidenced by a path coefficient of 0.193 and a p-value of 0.027. These results indicate that effective performance management, including setting environmentally focused goals and rewarding sustainable behaviors, leads to improved environmental outcomes. By integrating environmental objectives into performance evaluations, organisations can align individual employee goals with broader sustainability targets, thus enhancing overall environmental performance.

The mediating role of Green Employee Behavior (GEB) is evident across multiple relationships between GHRM practices and Environmental Sustainability (ES). For instance, GEB significantly mediates the relationship between Green Training and Development (GTD) and ES, as well as Green Performance and Management (GPM) and ES. The path analysis indicates that GEB has a strong direct impact on ES (coefficient of 0.638, p-value < 0.001), reinforcing its critical role in translating GHRM efforts into tangible environmental benefits. This underscores the importance of fostering pro-environmental behaviors among employees as a key lever in driving the overall sustainability agenda of organisation. Based on the findings, the mediator that is green employee behavior (GEB) has a significant impact on Environmental Sustainability (ES) as it's p-values is 0.000 which is below the acceptable significance p-value that is 0.05. The previous studies also suggest the same that Green employee behavior (GEB) has a significant relation with Environmental Sustainability (ES).

The Green Compensation and Benefits (GCB) also have a significant impact on Green Employee Behavior (GEB) as its p-value is 0.000 which is less than 0.05. The previous literature also indicates the same as green compensation and Benefits (GCB) have a positive relationship with Green Employee Behavior (GEB). The Green Performance and Management (GPM) have a significant impact on the mediator Green Employee Behavior (GEB) as its p-value is 0.000 which is below the acceptable significant value of 0.05. This hypothesis is also in line with the previous researches conducted. The Green Recruitment and Selection (GRS) have an insignificant impact on the mediator Green Employee Behavior (GEB) as its p-value is 0.781 which is above the acceptable significant value that is 0.05. This might be due to some discrepancies in data that's why it's not in line with the previous literature.

The Green Training and Development (GTD) has a significant impact on the mediator Green Employee Behavior (GEB) as its p-value is 0.055 which is almost equal to the acceptable value of 0.05. The previous studies also suggest that Green Training and Development has a positive relationship with Green Employee Behavior (GEB).

CONCLUSION AND RECOMMENDATIONS

This study established the critical role of Green Human Resource Management (GHRM) practices in enhancing organisational sustainability within the selected manufacturing organisations in Tema Metropolis, Ghana. By integrating environmental objectives into HR practices such as recruitment, training, performance management, and compensation, organisations can foster eco-friendly behaviors among employees, reduce costs, and improve productivity. Our research utilized Partial Least Squares Structural Equation Modeling (PLS-SEM), leveraging the versatility of this technique to manage complex models with multiple predictors and outcomes, particularly in light of our substantial sample size. The analysis, conducted with a sample of 322 corporate employees, exceeds the minimum recommendations for Structural Equation Modeling (SEM) as suggested by Kline (2011) and falls short of the "extremely excellent" benchmark set by Comfrey and Lee (1992). This substantial sample size bolsters the credibility of our findings, allowing us to confidently examine employee attitudes and perceptions regarding Green HRM practices, including their impact on social responsibility, environmental policies, and sustainable practices.

The validity and reliability of the measurement model were rigorously assessed through various criteria. Convergent validity was confirmed with the Average Variance Extracted (AVE), discriminant validity was ensured using the Fornell-Larcker criterion and the (HTMT) ratio, and indicator reliability was verified through factor loadings. These assessments collectively affirm the robustness of our findings and the accurate representation of latent constructs in our model. Our results highlight a significant relationship between GHRM practices and ES, illustrating the positive influence of effective HRM strategies on environmental outcomes. This reinforces the importance of integrating green practices into HRM frameworks to promote sustainable development.

From the study findings, the researchers recommended thus:

i. Manufacturing organisations should prioritize integrating environmental goals into their core business strategies, ensuring that sustainability is not just a side initiative but a fundamental aspect of their operations;

ii. They should invest in employee training programmes focused on environmental awareness and sustainable practices, empowering staff to contribute actively to green initiatives;

iii. Additionally, they should implement incentive schemes that reward employees for achieving green objectives, to foster a culture of environmental responsibility;

iv. They should establish clear metrics for measuring the success of Green HRM practices to help in tracking progress and make data-driven adjustments;

v. They should collaborate with other businesses and industry leaders to share best practices and innovations can also accelerate the adoption of effective Green HRM strategies;

vi. Continuous monitoring and adapting to new environmental standards and technologies will keep manufacturing organisations at the forefront of sustainability efforts, ensuring long-term environmental and economic benefits.

Theoretical Implication

This study tells us the need of significance of green human resource management in organisation and its impact on environmental sustainability. As our environment is in grave danger through various human practices which greatly cost us, even our lives. The need for green human resource management can benefit not just us but our future generations. As more organisations implement green human resource management, the better it would be for our environment. Thorough green recruitment and selection, we can ensure that employees are environment conscious and can contribute in the safety of environment and can comply with our companies' green polices. Green training and development of employees is beneficial as they are trained to work in an organisation which focuses and prioritizes environment as they are trained to produce boo degradable products and reduce carbon emissions which is greatly harming our environment.

Furthermore, Green performance and management in companies ensure that our workforce complies with our green policies and visions and is working under the banner of environmental sustainability. As they should be use renewable energy resources to save environment. Other than that green compensation and benefits is what motivates the employees to do their best and share new ideas related to environmental safety and sustainability. Green employee behavior ensures environmental sustainability and mediates the relationship between green human resource management practices and Environmental Sustainability. The hypothesis and our theoretical and conceptual framework also emphasize on the significance of GHRM on environmental Sustainability. The previous studies also tell us that how much pivotal role Green human resource management in organisation plays in environmental sustainability.
Moreover, the study gives deep insight to other organisations and encourages them to implement green human resource management in organisation. And it also highlights the need for government to make green policies and ensure that all organisations comply with the government policy about GHRM to work for environmental sustainability.

Managerial Implications

The findings of this study have critical managerial implications, emphasizing the need for organisations to strategically align their HR practices with environmental sustainability goals. By integrating green criteria into recruitment and selection processes, managers can attract talent that is inherently aligned with the company's sustainability vision, thus fostering a workforce committed to environmental stewardship. Investment in comprehensive green training and development programs is essential to empower employees with the knowledge and skills required to innovate and implement sustainable practices effectively.

Furthermore, linking performance management and compensation to environmental outcomes can significantly motivate employees to prioritize sustainability in their work, ensuring that organisational goals are met with a strong commitment to eco-friendly practices. Lastly, fostering green employee behaviors is crucial, as it serves as a mediator that enhances the overall impact of Green HRM initiatives on environmental sustainability, driving long-term success and competitive advantage in a market increasingly focused on sustainability.

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