

## **The Role of Green Human Resource Management in Promoting Sustainable Development in Manufacturing Industries**

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### **Abstract**

The literature review explores how industries employ strategies to encourage sustainable growth and use green human resource management, or GHRM. As sustainable concerns and regulatory demands continue to grow, industrial organizations are gradually incorporating sustainability into their operational and strategic frameworks by implementing GHRM practices. GHRM encompasses a range of environmentally responsible HR practices, including green hiring, performance evaluations, training, and employee involvement in environmental initiatives. The article includes several theoretical stances, such as institutional philosophy, stakeholder analysis, and the resource-based view (RBV), to demonstrate how GHRM aids organizational initiatives toward sustainability and environmental responsibility. According to the research study, GHRM significantly impacts a sustainable workplace culture, pro-environmental behavior, and environmental performance. The paper also highlights several research gaps, including a lack of empirical data from emerging economies, inconsistent quantification of green HR outcomes, and a lack of longitudinal studies. Although GHRM has a lot of potential to improve industrial processes, the results suggest that its efficacy depends on organizational commitment, leadership support, and linkage with broader sustainability goals. The foundation for further study and practical implementation is laid by this analysis, which emphasizes the critical role that human capital plays in fostering sustainable industrial progress.

### **Keywords :**

Sustainable Development - Environmental Sustainability- Green Practices- Environmental Management Systems (EMS)- Sustainable HR Practices- Eco-Friendly HR Policies

### **Introduction**

As global environmental issues like pollution, resource depletion, and climate change become more urgent, sustainability is a central focus of business strategy and industrial policy. The manufacturing sector, among others, is closely watched because of its substantial ecological impact, which includes high energy use, waste production, and greenhouse gas emissions. These issues call for creative strategies that promote environmental stewardship without sacrificing productivity and economic growth.

As a result, businesses are under increasing demands from governments, investors, consumers, and non-governmental organizations to integrate sustainability into their main business operations. According to the triple bottom line paradigm, sustainable development in manufacturing not only addresses social fairness and economic viability but also resolves related problems. In this paradigm, human resources play a key part as employees are essential for developing and maintaining sustainable practices globally.

Environmentally friendly human resource management, or GHRM, has gained recognition as an effective means of integrating environmental sustainability into HR policies and practices. Green recruiting, evaluation, development, and growth. Employee involvement in sustainability projects is just one of the many activities that fall within the broad area of GHRM. GHRM fosters behavioral change that aligns individual and organizational goals towards sustainability by educating employees about green values and skills.

In manufacturing companies, where operational procedures frequently include significant resource consumption and environmental effects, the strategic integration of GHRM is particularly pertinent. Research has indicated that good GHRM practices help to lower carbon footprints, increase energy efficiency, reduce waste, and promote green technology innovation. Additionally, by improving the Social responsibility of organizations (CSR), organizational commitment, and staff motivation, these strategies offer a variety of advantages.

GHRM deployment in manufacturing confronts several obstacles despite increased demand. These include inadequate organizational support, a lack of awareness of environmental issues among management and staff, and reluctance to change in traditional industrial cultures. Furthermore, thorough empirical research that looks at the long-term effects of GHRM on sustainability Results is lacking, especially among small and medium-sized enterprises (SMEs) and in developing nations.

The goal of the study of the literature is to present an in-depth overview of the state of GHRM research at present and its role in promoting sustainable development in manufacturing organizations. In addition to discussing obstacles to successful implementation, it will examine the main theoretical frameworks that support GHRM and identify best practices and their effects. The article aims to provide insights from an analysis of current data to researchers, workers, and governments interested in employing HRM to achieve sustainable manufacturing goals.

## Literature Review

**Introduction to Green Human Resource Management (GHRM)** Green human resource management (GHRM) is a new idea that incorporates environmental management into HR policies and procedures to support sustainability in businesses. GHRM emphasizes green values in hiring, training, evaluation, and incentive programs to encourage employees to act in an environmentally friendly manner (Renwick et al., 2013). GHRM is crucial for promoting sustainable practices at the operational level in manufacturing sectors, where high levels of energy consumption, waste production, and emissions have a significant negative impact on the environment.

**GHRM's theoretical basis.** A selection of theoretical models can be used to understand the significance of GHRM in sustainable development. According to the Resource-Based View (RBV), human capital is a valuable organizational asset and a source of competitive advantage when it aligns with strategic sustainability goals (Barney, 1991). Stakeholder theory further supports the significance of using environmentally responsible practices to meet the expectations of many stakeholders, such as customers, employees, and regulatory bodies. According to institutional theory, companies are compelled to adopt green HR practices to be accepted by external variables like legislation and societal norms.

**Green HR Practices in Manufacturing Industries:** The following important GHRM practices have been used in manufacturing contexts, according to the literature:

- Employers place a high priority on hiring workers who share their values and are environmentally conscious (Jabbour, 2011).
- Environmentally friendly learning and research: To improve the skills of employees and skills in environmentally friendly production, energy saving, and waste management, companies provide training (Zoogah, 2011).
- Green Performance Management: Environmental goals and behaviors are incorporated into performance appraisal systems as evaluation criteria (Renwick et al., 2016).
- Green incentives and rewards: Workers receive incentives for taking part in sustainability projects, promoting an environmentally conscious culture.

**Effects on environmental sustainability:** Research shows an important connection between GHRM and manufacturing's achievement of the Sustainable Development Goals (SDGs). Improved energy efficiency, waste minimization, and adherence to environmental rules are all benefits of GHRM practices.

- Social Performance: Increased corporate social responsibility (CSR), workplace safety, and employee happiness.
- Economic Performance: Enhanced brand reputation and cost savings from effective Resource use boosts market competitiveness.
- According to Jabbour et al. (2013), businesses that use GHRM have a higher chance of achieving sustainable results over the long run, especially when HR policies are completely linked with environmental management systems (EMS).

**GHRM and Sustainable Organizational Performance:** In several studies, GHRM practices have been strongly associated with improved environmental and organizational performance. Organizational environmental performance immediately improves when GHRM is implemented since it raises employees' green commitment (Ansari et al., 2021). According to Islam et al. (2020), businesses that adopted GHRM had a reduction in staff turnover and an increase in eco-friendly practices—two factors that are critical to the long-term viability of industrial operations.

Zaid et al. (2018) developed this viewpoint by identifying green supply chain activities as mediators in the link between sustainability performance as well as GHRM. This indicates that GHRM's impact extends beyond the organization and affects supply chain sustainability, which is an important component of the manufacturing industry.

**Employee Engagement and Green Behaviors:** In GHRM literature, employee engagement becomes a major theme. Employee empowerment, ecologically focused performance reviews, and green training are all consistently associated with increased pro-environmental behavior. Pham and colleagues (2019) pointed out that when workers feel appreciated and involved in sustainability initiatives, GHRM encourages voluntary green behaviors. According to findings offered by Chaudhary (2019, 2020), organizational identity acts as a link in the relationship between GHRM and green behavior among employees. Developing a shared identity is a calculated approach to boost GHRM efficacy since workers who have a strong sense of loyalty to their companies are more likely to support green projects.

**Challenges in Implementing GHRM in Manufacturing:** Despite GHRM's potential, several studies indicate that implementation in manufacturing settings continues to face obstacles. **These include:**

- Lack of awareness and understanding of GHRM concepts (Renwick et al., 2013)
- Resistance to change among employees and management (Islam et al., 2020)
- Weak leadership commitment and poor green infrastructure

The success of GHRM is further influenced by contextual factors such as leadership emphasis, corporate culture, and industry features. Islam et al. (2020) observed that the organizational preparation and environmental orientation of leadership greatly impact the success of GHRM interventions.

**Theoretical Underpinnings and Frameworks:** GHRM is frequently positioned under theories like the Resource-Based View (RBV), which contends that employees' eco-friendly actions are rare, precious, and unique resources that give businesses a competitive edge (Jackson et al., 2011). Studies that look at how organizational identification impacts green behavior are also supported by social identity theory, as demonstrated by Chaudhary (2020).

**Challenges and Gaps in Existing Research:** Despite the promising findings, several challenges persist in the literature:

- The empirical study on small and medium-sized businesses (SMEs), especially in developing countries, is lacking.
- Inadequate long-term data to evaluate GHRM projects over time.
- Traditional manufacturing cultures' resistance to change, particularly in those with low levels of environmental consciousness.
- Different metrics are used to assess how well GHRM practices are working in different sectors and geographical areas.

To fill these gaps, further research is required, especially in the areas of industry-specific analysis and cross-cultural studies.

## **Results and Discussion**

Green Human Resource Management is growing more acknowledged as an essential tool for promoting sustainable development in manufacturing businesses, according to a comprehensive evaluation of the body of existing literature. Several important conclusions are drawn from the examined studies:

### **GHRM's Effects on Environmental and Organizational Performance**

Research regularly shows that GHRM methods significantly improve some sustainability-related aspects. GHRM improves employees' green commitment and pro-environmental actions, which ultimately results in improved environmental performance, according to Ansari et al. (2021). Islam et al. (2020) also showed that companies that use GHRM methods saw lower employee turnover and more environmentally responsible conduct, both of which are essential for sustainable manufacturing operations. In addition, Zaid et al. (2018) discovered that the relationship between sustainability performance and GHRM practices is mediated by green supply chain practices, which in turn affect the management of green supply chains that is green. These findings show how human resource strategies relate to the broader goals of environmental and economic sustainability.

### **Employee Engagement as a Catalyst for Sustainability**

The literature emphasizes how important employee involvement is to GHRM results. Sustainable training, employee involvement, and performance management all significantly boost employees' voluntary green behaviors, according to Pham et al. (2019), which enhances the performance of the environment. Organizational identification mediates the relationship between GHRM practices and green employee behaviors, according to Chaudhary (2019, 2020), indicating that cultivating an awareness of organizational participation is essential to the achievement of GHRM implementation.

### **Challenges and Moderating Factors**

There are still obstacles to successfully implementing GHRM in manufacturing sectors, despite the encouraging data. Among the most significant obstacles are a lack of awareness, resistance to change, and inadequate managerial support. External elements that greatly influence the effectiveness of GHRM practices include leadership emphasis, company culture, and industry type. For example, Islam et al. (2020) emphasized that the degree to which GHRM practices result in sustainable outcomes depends on how prepared the organizational environment is. To customize GHRM projects to a particular industry setting

### **Theoretical and Practical Implications**

According to the findings, GHRM is essential to the process of integrating sustainability into the organizational procedures. In practice, manufacturing companies can make use of GHRM tactics, like green hiring, training, and performance rewards, to foster an eco-aware workforce and support sustainable development. These approaches are more effective when combined with leadership support and corporate culture.

### **Conclusion of the Literature Review**

According to the literature, GHRM is a tactical instrument for attaining sustainable development in the industrial sector. Businesses can improve performance in environmental, social, and economic domains by coordinating human resource practices with environmental objectives. However, more empirical studies, policy backing, and leadership commitment are necessary for GHRM to realize its full potential. The future of responsible manufacturing will continue to be greatly influenced by GHRM as sustainability emerges as a key factor in business performance.

### **Future Research Directions**

While recent studies have confirmed the positive impact of GHRM, more research is required to look at external factors that affect its effectiveness, such as societal norms and regulatory frameworks. A longitudinal study may help us understand how GHRM practices affect environmental performance over some time.

**Summary Table: Key Studies on GHRM in Manufacturing**

Author(s)	Variables Studied	Key Results
Ansari et al. (2021)	Green involvement, sustainability, and GHRM practices	GHRM promotes environmental performance by improving employee behavior and green commitment.

Islam et al. (2020)	Environmental behavior, employee turnover, and GHRM procedures	GHRM lowers turnover and improves environmental behavior preparedness among organizations is essential for success.
Zaid et al. (2018)	GHRM, performance in sustainability, and green manufacturing techniques	The relationship that exists between GHRM and initiatives to improve the supply chain is maintained by sustainability performance.
Pham et al. (2019)	Green culture, employee engagement, and voluntary green behavior	Engagement among staff members serves as a go-between for environmental outcomes and GHRM.
Chaudhary (2019, 2020)	GHRM practices, organizational identification, and eco-friendly activity	The correlation between GHRM and green behavior among employees is mediated by organizational identification.
Renwick et al. (2013)	Green HRM, sustainability in the environment, and results for workers	GHRM improves sustainability performance and promotes pro-environmental behavior.
Jabbour & Santos (2008)	Organizational performance, management of environmental systems, and GHRM	GHRM supports the integration of environmental management systems into HRM, boosting performance
Yong et al. (2020)	Sustainable achievement, innovative green technologies, and GHRM practices	Green technology is positively impacted by GHRM, which results in long-term company performance.
Tang et al. (2018)	Environmental efficiency, corporate citizenship behavior (OCB), and green HRM	In engaging employees, GHRM encourages environmental OCB and performance.
Mousa & Othman (2020)	Green habits, support from organizations, and GHRM	The association between green behavior and GHRM among workers increases when perceived organizational support is present.
Dumont et al. (2017)	GHRM, greener psychological environment, employee green behavior	The correlation between GHRM and pro-environmental behavior is controlled by a green psychological climate.

Singh et al. (2020)	Green society, sustainability, and GHRM	GHRM contributes to developing a green society that enhances environmental performance
Yusliza et al. (2019)	Green HRM, psychological green climate, and sustainable behavior	The LINK between GHRM and environmentally friendly conduct is controlled by psychological green environment.
Ahmad (2015)	GHRM, environmental management, HR functions	Green HR methods are important for achieving environmental management objectives.
Opatha & Arulrajah (2014)	Green HR functions, green hiring practices, and green management of performance	Greener job design and appraisal systems align with sustainability.
Norton et al. (2015)	Pro-environmental behavior, HRM systems, and sustainability	Supportive HRM systems encourage voluntary environmental behavior
Milliman & Clair (2017)	GHRM, ecological values, and organizational practices	Ecological values embedded in HRM lead to stronger sustainability practices
Kim et al. (2019)	GHRM, Sustainability, and green leadership that transform	Management and GHRM work together to improve sustainability performance.
Jackson et al. (2011)	HRM policies, the environmental approach, and the results of the company	Integration of HRM with an environmental approach boosts company sustainability results.

**Table in Integration and Theory**

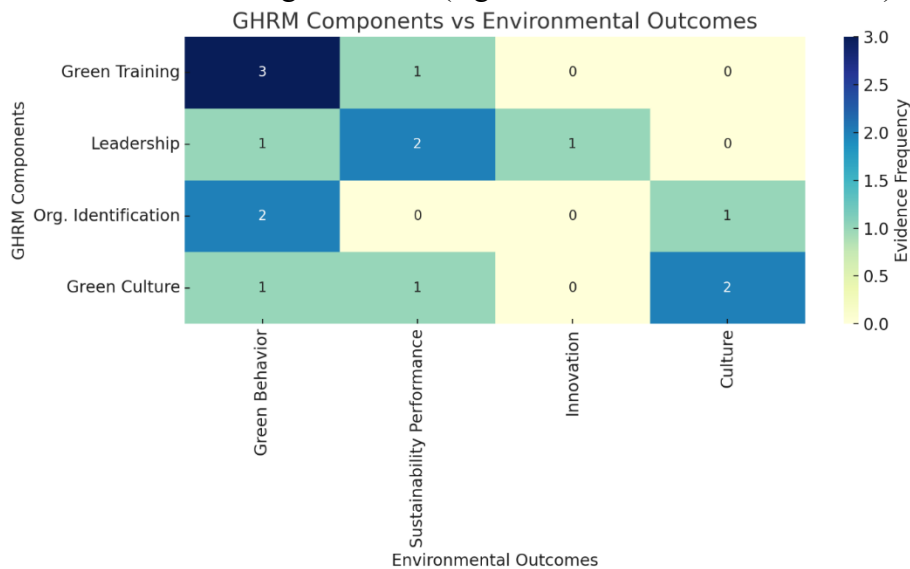
Theory	Concept	Application to GHRM
RBV	Human capital is an important strategic asset	Green skills with competitive advantage correlation
Stakeholder Theory	Organizations must manage various kinds of problems involving stakeholders.	GHRM responds to the ecological needs of society, regulators, and employees.
Institutional Theory	Organizations follow social and legal requirements.	GHRM has been implemented in response to social demands and environmental laws.

Social Identity Theory	Identification of employees with firm values	Green behavior and GHRM are controlled by organizational identity.

**"Mapping the Influence of GHRM Components on Environmental Outcomes"**

A visual overview of the primary relationships examined in the literature on Green (GHRM) may be seen in the associated graphic. The four basic GHRM components—Green Training, Leadership, Organizational Identification, and Green Culture—are mapped against the four primary environmental outcomes that are frequently assessed in empirical research: Green Behavior, Sustainability Performance, Innovation, and Culture.

The component-outcome relationship's frequency of observation or support across studies is shown by each cell in the heatmap. Stronger literature representation is indicated by darker or higher-valued cells, which suggest areas that require more thorough research (e.g., Green Training → Green Behavior). On the other hand, less valuable or lighter cells draw attention to areas that have not received enough attention (e.g., Green Culture → Innovation).



Based on your literature review, the frequency of evidence connecting distinct GHRM components to various environmental outcomes is displayed in this heatmap. This aids in the visual identification of both possible research gaps (e.g., Green Culture → Innovation) and areas of significant study focus (e.g., Green Training → Green Behavior).

**Conclusion**

Green HRM is an important method that helps companies become more sustainable by using green hiring, training, and personnel management practices. GHRM promotes sustainable growth in sectors such as manufacturing by motivating staff to take care of the environment and strive for sustainable development objectives. According to studies, organizations that use GHRM frequently observe improved environmental outcomes and more motivated employees. The design can be challenging to implement, GHRM, nevertheless. Low awareness, a lack of support from executives, and reluctance to change continue to be problems for many firms. Additionally, there isn't much research on GHRM's effectiveness in developing nations or

smaller businesses. Strong leadership, a sustainable culture, and HR practices that align with their green objectives are necessary for firms to maximize the benefits of GHRM. In this approach, industries can develop while maintaining the environment for coming generations.

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